of geophysical data. The articles have been clearly presented, and in most cases a table of symbols and a bibliography are given. The figures employed are clear and well reproduced, although one might desire more illustrations of equipment. The appearance of the book is pleasing, and the choice of type and the general make-up are well done.

The first paper, on the "Automatic Processing of Geophysical Data," might not seem important to some, but in research bureaus where a mass of data is being accumulated each day a process of this sort is necessary. The methods employed by geophysical departments of the various petroleum companies could have been included here. The article on statistical methods is also important. Although these techniques are being used more generally in the field of geophysics, they should be employed with care. As the literature has shown in the past, too many untrained statisticians have brought forth weird theories by the improper use of accurate data.

The studies on the atmosphere and estuarine hydrography are clear and comprehensive. Dr. Woollard's paper on gravity is excellent, both for interest and for coverage, as is Balsley's article on aeromagnetics.

To the expert or advanced student the book provides little that is new in that person's respective field. The papers are too brief to contain the fine points specialists would be seeking. The book has fulfilled the end of explaining some of the branches of geophysics to the uninitiated, however, and Dr. Landsberg is to be commended for this. It is hoped that future volumes will prove as helpful.

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Volumetric and Phase Behavior of Oil Field Hydrocarbon Systems. M. B. Standing. New York: Reinhold, 1952. 123 pp. Illus. $10.00.

This book will be a welcome addition to the tools available to the petroleum engineer, the scientist, and the field man associated with measuring and interpreting the behavior of oil field hydrocarbon systems. Available but widely scattered data have been compiled with an appreciable amount of original material into a working manual for reservoir hydrocarbon calculations. The book is liberally interspersed with usable graphs and many sample calculations in sufficient detail for any good student to follow with ease. It should be particularly helpful in training laboratory technicians, and the chapter on "Sampling Methods and Apparatus" can be profitably read by many a field engineer.

Oil field hydrocarbon systems are treated in three classes: gases, condensate systems, and dissolved gas systems, with supporting chapters on general phase behavior of hydrocarbons, sampling methods, and reservoir material-balance calculations. This latter chapter will be valuable to the newcomer for its clear discussion and examples of the use of laboratory PVT data in reservoir calculations based on the Schilthuis equation and others. Three valuable charts, in a pocket on the inside back cover, enable approximation of formation volumes of both condensate and dissolved gas systems, and bubble-point pressures of the latter, from readily available field data such as gas-oil ratio, gas and tank oil gravities, and reservoir temperatures and pressures. These empirical correlation charts will save the practicing reservoir engineer much time in approximating and checking calculations on the physical properties of reservoir fluids.

The book is not for the advanced scientist looking for extensions and innovations of theoretical treatment. It does, however, do an excellent job of definition and explanation of the necessary terminology and theory for the working calculations. The book is aimed at the practicing reservoir engineer and technician and will be greatly appreciated by them.

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Psychology

Psychoanalysis as Science. Ernest R. Hilgard, Lawrence S. Kubie, and E. Pumpian-Mindlin. Stanford, Calif.: Stanford Univ. Press; London: Geoffrey Cumberlege, Oxford Univ. Press, 1952. 174 pp. $4.25.

This volume presents the Hixon Lectures on "The Scientific Status of Psychoanalysis," delivered at the California Institute of Technology. The contents concern the frequent question of whether the discipline of psychoanalysis is a science, and how its methods, theories, and findings may be subjected to scientific investigation and validation.

Dr. Hilgard, chairman of the Department of Psychology at Stanford, opens the series with a discussion of "Experimental Approaches to Psychoanalysis." He presents a thoughtful selection of the extensive experimental work done on psychodynamics with animals, children, and adults. The evidence tends to confirm certain psychoanalytic concepts and theories. As Hilgard carefully points out, however, to show that theoretical relationships proposed by psychoanalysts are plausible does not solve the problem of how the relationships are caused, or prove that the analytic method is scientific. Experimental studies of psychotherapy of human neurosis and of artificially induced neurosis in humans and animals show satisfactory correspondence with the predictions of psychoanalytic theory. Although these touch only the more superficial problems posed by psychoanalysis, they indicate the way toward more profound critical studies.

"The Position of Psychoanalysis in Relation to the Biological and Social Sciences" is the final lecture, given by Pumpian-Mindlin, chief of the Mental Hygiene Clinic in the Los Angeles Veterans Administra-

tion. This is an interesting historical review of analysis as it developed from a basis of man as a biological phenomenon and as it views man as a product of his social milieu. Because of the complexity of the relationships it attempts to decipher, Mindlin feels that the correlations and hypotheses of psychoanalysis cannot be as precise as those of the more exact sciences.

The real meat of this book is in the lectures on "Problems and Techniques of Psychoanalytic Validation and Progress" given by Kubie, a practicing analyst in New York City and clinical professor of psychiatry at Yale. The reviewer has never seen a more objective, accurate, or penetrating critique of the psychoanalytic method, or a more astute delineation of a problem in dire need of investigation. Kubie boldly and wisely suggests that it is unnecessary to undertake laboratory validation of the observations on the facts of human behavior made by psychoanalysts. These are obvious to any young parent or other observer who is not too reluctant to look human nature in the eye.

The things needing more thorough investigation are: (*a*) the basic exploratory tool of psychoanalysis, free association, (*b*) the forces of the transference, and (*c*) the problem of the validation of interpretations. Greater understanding and increased precision of these basic features of the analytic process are urgently needed. The validation of fundamental psychoanalytic principles of dynamics, genetic theories, personality structure, and causal relationships depends upon the application of techniques of greater quantitative and qualitative precision than are yet available. Kubie outlines an abundant list of problems and tentative approaches to them, hoping the future will bring contributions from allied psychological disciplines and the more exact sciences to clarify and validate the psychoanalytic method.

For psychologists, psychoanalysts, and any others interested in this field, the reading of this book should be most stimulating and rewarding.

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Appraising Personality: The Use of Psychological Tests in the Practice of Medicine. Molly Harrower. New York: Norton, 1952. 197 pp. $4.00.

This book has as its primary aim the demonstration of the contribution which the test methods of the clinical psychologist can make to the physician's evaluation of both psychologic and somatic disorders. Parts I and II, which deal with clinical psychology in general and with descriptions of specific test procedures such as the Rorschach and the Wechsler-Bellevue scales, take the form of a dialogue between an "inquiring" physician, who takes the tests himself, and a clinical psychologist in private practice. Part III, which consists of case reports, takes the form of exchanges of letters between the physician (now referring patients for examination) and psychologist.

Written in an engaging, rather breezy manner, the presentation is quite effective. One gains a clear impression of what a clinical psychologist is, what he tries to do when he sets up in private practice, what his procedures purport to measure, how he goes about interpreting performance, and how the interpretation helps in the individual case. Although the picture is clear enough, it is not, in the reviewer's opinion, an altogether well-rounded one. As is perhaps natural in a book by a medical psychologist addressed to physicians, the field of clinical psychology is presented as a sort of laboratory adjunct to medicine, providing formal psychodiagnostic services to the physician. This is a formulation which the majority of clinical psychologists would hold to be much too restricted. As conceived by its practitioners, clinical psychology consists not only of formal diagnostic functions (the "method of tests") but also of more comprehensive behavioral evaluation and of techniques for the modification of behavior, such as counseling, re-education, and psychotherapy.

Psychological test methods are introduced by way of the timeworn (and thoroughly unsound) "X-ray analogy," wherein they are conceived as being able somehow to penetrate to the basic personality structure and the fundamental dynamics *behind* behavior. Although this metaphor may have had some utility in the past, it is surely time that test methods be presented for exactly what they are—namely, measurements of selected behavioral samples with actual or assumed predictive significance. In this regard, it must be said that a good deal of psychodiagnostic work, particularly with projective techniques, rests upon assumptions which either still lack empirical validation or have been demonstrated to be probably invalid. It is in this area of critical evaluation of the procedures themselves that the book shows a decided weakness. Interpretations of details of performance on the Rorschach and drawing tests are rather glibly presented as having a solid foundation in controlled clinical experience which they do not in fact possess. The use in clinical practice of the Szondi test, a procedure that has not met empirical tests of validity, is defended on the ground that "nonetheless, it works and can be extraordinarily helpful at times." But, of course, whether the test "works" is precisely the question which systematic validational study has attempted to answer. Here, an analogy is drawn with the Wassermann test as a procedure, the exact nature of which is unknown, but which nevertheless "works." The analogy is inappropriate. Regardless of what is known or not known about the basic biochemistry of the Wassermann, it does show sufficiently consistent relationships with other events to provide a basis for sound diagnostic inference. In short, it is a valid test. This is not true of the Szondi.

Yet, despite the uncritical nature of the exposition, the book has merit as an introduction to current formal psychodiagnostic practice. It is quite readable and should at least, as Alan Gregg states in the intro-

duction, "remove the burrs of misunderstanding and ignorance." Once these burrs are removed, some medical scientists can be depended upon to raise pertinent questions about the validity of specific procedures.

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A Further Study of Visual Perception. M. D. Vernon. New York: Cambridge Univ. Press, 1952. 289 pp. Illus. $7.00.

In 1937 the author of this volume published its predecessor, *Visual Perception.* The earlier work was a rather brief, but nevertheless comprehensive, review of investigations throughout the entire area of its title. Critical comment was minimal, and no systematic position was adopted.

A Further Study of Visual Perception is a revision of *Visual Perception.* Only those earlier studies considered particularly important are now included in its coverage; for others, the reader is referred to such historical treatments as Boring's. A great many recent investigations find place in the volume, however, and thus its bibliography embraces over 500 references. There are 30 figures now, as against 19 in the original edition.

Once more the author ranges widely. After a brief discussion of "the nature of perception," she studies the phenomenology of the perceptual process, form perception, spatial perception, the constancies, frame-of-reference and anchoring effects, the time error, real and apparent movement, flicker, and fusion. Finally, there is emphasis on the recent work by Michotte (concerning the perception of causality, intentionality, and reality), and a rather long chapter on "internal and individual factors" in perception.

Theoretical integration is not stressed, although the author intersperses critical comments among experimental results. There is a general sympathy for the introspective, phenomenological approach. The stated thesis of the book is that the perceptual field is structured for stability by the perceiver, and that it displays an "extraordinary unlikeness . . . to the stimulus field;" a second point of emphasis is that there are large individual differences in perception.

It is a difficult task to summarize a great many investigations in a relatively brief volume—this the author has managed to do, and so provides a valuable reference book. Like most such books, however, it needs to be used with some caution. Where dubious methodology lies behind stated conclusions—as, for instance, in many of the motivational studies—that fact is not always indicated. There is perhaps a slight nativistic bias. Just occasionally, there are errors of fact: the figural aftereffect is inaccurately described, as is the Schafer-Murphy experiment; and Margaret Elizabeth Tresselt and Anna Gertrude Douglas are referred to by masculine pronouns.

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The Medical Sciences

Poliomyelitis. Papers and discussions presented at the Second International Poliomyelitis Conference. Philadelphia–London: Lippincott, 1952. 555 pp. Illus. $7.50.

I have heard it said that international congresses on poliomyelitis (as on other scientific or medical problems) are a waste of time, because little or nothing is presented that has not already been published, or soon would have been published, or could not be read at leisure with greater profit. Since I have attended and greatly enjoyed both the 1948 and 1951 congresses on poliomyelitis, for reasons not solely related to the acquisition of new knowledge, I am perhaps not qualified to give a dispassionate opinion about their ultimate usefulness. It seems to me that these conferences serve their most useful purpose in providing a synthesis of accumulated, scattered information and, through the minds of certain gifted people, a critical evaluation as well. The individual publications on poliomyelitis are scattered in time and space in countless journals the world over, but within the covers of this book, containing the papers and discussions presented in Copenhagen in 1951, are many thoughtful communications dealing with almost every aspect of the numerous scientific and medical problems in poliomyelitis. The subjects covered range from the interaction of viruses and their host cells, the newer knowledge of the effects of poliomyelitis virus on various tissues *in vitro* and *in vivo,* the pathology, pathophysiology, immunity and resistance in invaded hosts, and the ecology of the infection, to the practical problems of laboratory and clinical diagnosis and the management of patients, with special emphasis on respiratory insufficiency, reconstructive surgery, physical medicine, and the social and psychologic aspects of the disease.

Those who are not impressed with the importance of holding these congresses and oppose them on the grounds of their great cost may suggest that the same synthesis could be achieved by publishing in book form, at three-year intervals, critical "present-status" reviews of the whole field. It must be pointed out, however, that the discussions presented at these conferences are as vital a part of the total synthesis as the formal presentations. Although the editors of the proceedings have not (at least in all instances) submitted the transcribed remarks to the speakers for correction, the informal discussions read quite well and, with a few exceptions, "sound" alive and spontaneous. The speakers should not, however, be held responsible for all details appearing under their names, for I have noted certain errors in the transcription of my own remarks.

Even those who attended the conference, but found it difficult to follow the on-the-spot translations of discussions in languages they did not understand, may find the English translations in this book informative