person's calling—the calling which determines his responsibilities" (page 36).

What has gone wrong here? By transposing epistemological questions concerning the validity of theoretical claims into psychological questions concerning "claims" and the acceptance of claims," Polanyi has, I suggest, deprived himself of any means whatsoever for defining the *meaning* of a claim to truth. The same thing occurs in his briefly sketched theory of values; when he has finished we are in no position even to define what an authentic value might be; we are left in the hazards of an admiring submission to a greatness which might also be a corruption. Now this, indeed, may be an essential part of our existential situation. But even this cannot be the whole story, since if it were, all talk about real greatness and real corruption would be senseless in principle. If the very *criterion* by which we are to estimate ourselves is one or more historical heroes, what *sense* indeed does it make to talk then of "corruption"? Corruption in *terms* of what? And what sense does it make to talk of validity in knowledge if that notion is dissolved into "acceptances," "claims," and "commitments"? Has not Polanyi so radically psychologized the whole affair that he has deprived himself of the very means by which he might give meaning to the validity he aims at, accepts, and claims? The value of Polanyi's analyses is great; but I find that in its ultimate formulations all dialectical tension between the subjective and objective is lost, an almost inevitable result of confusing the phenomenology of validity with psychology.

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Chemical Engineering Practice. vol. 6, *Fluid Systems, II.* Herbert W. Cremer and Trefor Davies, Eds. Academic Press, New York; Butterworths, London, 1958. xxvii + 600 pp. $19.50.

This latest volume in a series of reference books on chemical engineering practice presents the conventional unit operations of gas absorption, evaporation, fluidization, adsorption, leaching, crystallization, filtration, and centrifugation. In addition, liquefaction and fractionation of gases, as well as refrigeration practice, sublimation, and vacuum freeze-drying are covered. The general topic of colloids is also included.

As in the previous volumes of this work, the author of each chapter has attempted to present highlights and emphasize the practical aspects of a particular field. However, for certain operations two chapters have been included, one on theory and one on practice. This procedure, for example, has been followed in the case of gas absorption and crystallization. Although thorough coverage of each topic included would require a volume the size of the total compilation, the authors have, in most cases, presented useful details, which may be amplified by reference to the extensive bibliography. This is a valuable addition to the chemical engineer's bookshelf, particularly because of its emphasis on technological details.

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Oceanography and Marine Biology. A book of techniques. H. Barnes. Macmillan, New York, 1959. 218 pp. Illus. $7.

Oceanographers have developed a large number of special techniques and devices with which they attempt to investigate the depths of the sea from their research vessels. A review of these methods and instruments, such as this book purports to present, could serve a useful purpose for the general public as well as for the student and professional oceanographer.

The author has deliberately omitted the many kinds of fishing gear, and he does not consider the Aqualung or such devices as the bathysphere and bathyscaphe. Even within these limits, the range of techniques is very great, and it would be too much to expect comprehensive coverage in so small a book. Biologists, to whom the book seems to be primarily addressed, will doubtless find the section dealing with methods of sampling living organisms too cursory and uneven. A number of instruments are very briefly described and illustrated, and a very few are given detailed, at times minute, description. Only in the case of the Hardy plankton recorder is there sufficient discussion of the limitations and advantages of an ininstrument. Biologists may find more satisfactory for their purposes the chapter on measuring such properties of water as currents, temperature, and salinity. Some common, and a few uncommon and outmoded, instruments used by physical oceanographers are briefly described and illustrated. There is, however, no mention of methods for measuring transparency and radiation in the sea, factors that may be of paramount importance to biologists.

The most useful portions of the book are the chapter that deals with the use of sound waves in the sea, in which the use of the echo sounder and underwater sound in marine biology is discussed, and the chapter that deals with photography and underwater television. In the latter chapter is reviewed the recent work in underwater television, in which Barnes himself has been one of the most active participants. These two chapters present some material that it is difficult to find elsewhere in text form.

The text is marred by some digressions, and some of the verbal descriptions of the mechanisms are difficult to follow. A good portion of the figures seem to serve little purpose in such an abbreviated text. There is a bibliography of about 140 titles, none of which is cited in the text.

This book may be adequate as an introduction for the layman to some of the methods of oceanography, but it is too incomplete and too hurriedly written to serve as a handbook of techniques in marine biology and oceanography for the professional oceanographer, and the student is given too little insight into the applications and limitations of the techniques described to be able to use the techniques intelligently.

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Comprehensive Analytical Chemistry. vol. 1*A*, *Classical Analysis.* Cecil L. Wilson and David W. Wilson, Eds. Elsevier, Amsterdam, 1959 (order from Van Nostrand, Princeton, N.J.). xix + 557 pp. $17.50.

This book is the first part of the first volume of a treatise which will eventually comprise five volumes and about 6000 pages. In the general introduction the editors say, "The aim has been to provide a work which will act as a standard reference, self-sufficient in as many cases as possible, and where this cannot be achieved, a work which will be a natural starting point for any analytical investigation."

A chapter entitled "Analytical processes" occupies nearly half the book. It discusses materials, sampling, sta-