the arts and sciences into healthful interaction."

It is clear that healthful interaction is desirable, not only between art and science but between all intellectual disciplines. The question arises, however, whether precise semantic distinctions and new syntheses of old terminologies constitute a significant movement in this direction. If, as Cassidy asserts, there is a natural continuum unifying all intellectual activity, it is doubtful that C. P. Snow's case for the "two cultures" has any validity. One may not feel confident that, if science lacks a soul, it will find one in the humanities; nor may humanists find new efficacy in scientific tools. The alleged chasm may merely be an abstraction based on the real differences of values between men in an age of scientific weaponry and Cold War. Many humanists would challenge the contention that "ends" would arise from a union of art and science and that such ends would appear "morally and ethically just" to all; many would doubt that even men of good will could direct cultural change toward such ends.

This caveat does not detract from Cassidy's refreshing effort to build a philosophic system, encompassing art and science, for a complex world to which science may hold many keys.

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Changing Cultures

Traditional Cultures and the Impact of Technological Change. George M. Foster. Harper, New York, 1962. xiii + 292 pp. $6.50.

Every technical assistance expert who goes to one of the newly developing countries to help introduce better methods in health work, agriculture, industry, public administration, science teaching, or some other specialty, should read this book.

The major contribution of cultural anthropology to the equipment of technical assistance workers has been the "culture concept" itself. This concept engenders a point of view and an attitude which help to counter the natural ethnocentric tendency to assume that what is good, efficient, and "the right way to do it" in our society is also best for other societies. Beyond this, however, the writings of cultural anthropologists have not been as directly useful to those of us engaged in technical assistance as we might legitimately have hoped. Anthropological writings have run to case studies, mostly of rather primitive communities, and only occasionally have they come directly to grips with the problems that arise in development work.

George Foster's book changes this situation. It brings the kind of help that technical assistance workers need from the anthropologist and sociologist. Although it "is not intended as a handy pocket guide to successful technical aid work, and it contains no formal lists of do's and don'ts," it does present in a well-organized, clearly written way, with abundant illustrations from case histories and with numerous practical hints, those aspects of the knowledge of the social scientist, and especially of the anthropologist, which are most relevant to technological development in a traditional society.

In the less developed countries, 20th-century scientific culture is impinging upon traditional, prescientific cultures —"Clinical medicine struggles with folk remedies; the results of experimental agriculture are carried to custom-bound farmers; and literacy is brought to non-readers." Foster analyzes the way traditional cultures change, the barriers to change, the stimulants to change, and the role and problems of the technical expert. The responsible technician is the one who is able to adapt scientific technology and methods to the ecological, social, and economic environment of the developing country. Such technicians must learn to be "problem-oriented and not program-oriented," despite their training as engineers, doctors, or other professionals, which predisposes them toward programs of the types considered best in their home environment. There are several interesting pages on that "occupational disease of people who have been suddenly transplanted abroad," which Kalervo Oberg named "culture shock."

Foster devotes three chapters to the way the anthropologist works and to problems of teamwork in relating technical aid and social science. I think his generally excellent discussion would be improved if he recognized more clearly a distinction between the role of the anthropologist as *social scientist* and as *social technologist*. In the social field, as in the fields of the physical and biological sciences, we need both the scientist who is primarily interested in the advancement of knowledge and the technologist who, though scientifically grounded, concerns himself with inventing and applying methods of dealing with practical problems.

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Low Temperature Physics

Experimental Cryophysics. F. E. Hoare, L. C. Jackson, and N. Kurti, Eds. Butterworth, Washington, D.C., 1961. 396 pp. Illus. $14.

This book, which is described as a collection of review articles, consists of a collection of ten chapters; each of the first nine is by one of the editors or by a contributor, and their average length is 30 pages. The tenth chapter consists of a series of 12 very brief articles (average length, four pages); each of these articles is by a different contributor.

The first nine chapters cover such a variety of aspects of cryophysics (history, commercial production of liquefied air, storage of liquefied gases, mathematics of liquefaction, magnetic cooling, and four other topics) that there is little continuity and the overall impression is one of rather haphazard arrangement, with some probably unavoidable duplication of subject matter. In these chapters the presentation of the subject ranges from an adequate to an excellent treatment, and most chapters include extensive literature references to assist readers who wish to explore the subject more comprehensively.

The tenth chapter, on cryogenic techniques and miscellaneous applications, is crowded with so many short articles on unrelated (though important) subjects that its value lies primarily in providing what amounts to a series of abstracts with related bibliographies. A 25-page appendix includes 20 tables of thermal and physical data needed by workers in the field of cryophysics.

In summary, this book affords relatively brief treatment of many branches of cryophysics; the treatment varies from descriptive, to empirical, to mathematical investigation of selected problems. Although its contents are un-

even, the book will be welcomed by experimental workers. It will be useful for reference purposes to those concerned with engineering aspects of work at very low temperatures, and it could be used for supplementary reading by students. The book was not intended to be a textbook, and it would be difficult to use as such. There are many well-chosen photographs of cryogenic equipment, and line drawings are used generously and effectively to illustrate the text.

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Banach Spaces and Algebras

Spectral Theory. Edgar Raymond Lorch. Oxford University Press, New York, 1962. xii + 158 pp. $5.50.

This is a valuable addition to the family of books on algebraic analysis. It provides an introduction to the theory of Banach spaces and Banach algebras, for the advanced undergraduate or young graduate student of mathematics and, perhaps, for some students of engineering or physics. Contrasted with recent tomes on the subject, it presents, with careful attention to detail, only the most basic results of the theory, in Lorch's inimitable style, which precludes the boredom common to many brief axiomatic developments.

The material is treated through the spectral theory of linear operators, rather than by the other popular approach in which Banach algebras are made the basic vehicle. This is made clear in the following summary from the preface.

". . . in the chapters on Banach spaces and linear transformation theory one will find the Hahn-Banach theorem, the inverse boundedness theorem, and the uniform boundedness principle; also the standard material on reflexivity, adjoint transformations, projections, reducibility, and even a formulation of the mean-ergodic theorem. The chapter on Hilbert space presents all the classic facts on linear functionals and orthonormal sets as well as the preliminary theory of self-adjoint transformations (bounded or not) and resolutions of the identity.

"Chapter IV is devoted to the Cauchy theory for operators. It contains the central facts of spectral theory: spectrum, resolvent, the fundamental projections, spectral radius, and the operational calculus. This theory is then applied to the problem of determining the structure of an arbitrary self-adjoint transformation in Hilbert space. Finally, in chapter VI, we consider Banach algebras. These are exclusively commutative and have a unit. We find here a discussion of reducibility, normed fields, ideals, residue rings, homomorphisms, and maximal ideals, the radical, the structure space, and the representation theory."

I would like to have seen a more detailed discussion of the examples from which the theory evolved. Also, it would have been nice to have this concise introduction to algebraic analysis include other basic tools of the discipline, such as the Stone-Weierstrass theorem and the Krein-Milman theorem. But, perhaps their inclusion would have sacrificed the brevity that is the book's most valuable asset.

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Man and Machine

Modern Technology and Civilization. An introduction to human problems in the machine age. Charles R. Walker. McGraw-Hill, New York, 1962. xi + 469 pp. Paper, $4.75; cloth, $7.50.

For more than a decade the Technology Project at Yale University, of which Charles R. Walker is director, has studied the impact of technology on social organization and personality and the corresponding social and psychological conditions of productivity and technological performance. Out of this work have come a number of important books—mostly by Walker himself in collaboration with other members of the group [*Steeltown* (1950); *The Man on the Assembly Line* (1952); *Towards the Automatic Factory* (1957)—and a good many articles and monographs. We owe to this work basic theoretical insight into the human and social meaning of technology and into the technological dimension of personality and cultural values. We owe to it also important practical lessons that have found wide application in industry: (i) the concept of "job enlargement" for repetitive, unskilled jobs, with its resultant increase in both job satisfaction and job performance, and (ii) the understanding that automation, especially in clerical work and data processing, is as much a change of social structure, relations, and attitudes as it is a change in methods and instruments. This understanding has helped speed greatly the transition from conventional to electronic data processing in a number of business and government offices. Finally, we owe to Walker's work the understanding that, in selecting workers for a new industrial process, social skill —for example, experience in a mass-production plant—is a more important qualification than kindred technical skill acquired in an alien social environment; this principle has been applied most successfully in staffing a new aluminum operation in a preindustrial country of West Africa.

In the present book Walker has attempted to pull together the major work done on the relationship of technology —especially of modern industrial technology—and personality, social order, and culture. He has chosen an unusual method of doing this: the book is essentially an anthology of writings from a great many sources (mainly American sources, one regrets) connected by a commentary written by Walker and supported by separate (and excellent) bibliographies. This makes for a kaleidoscopic, but unfortunately not for a clear or cohesive, presentation.

There is simply not enough from any one author to produce a readable anthology. In ranging from the history of technology (for example, Mumford and the *History of Technology*) through Frederick W. Taylor, Henry Ford, the modern American "Human Relations" school, and (alas) to the cosmic problems "Whither Technology" and "Whither the Human Race," Walker's book contains far more than any one can digest, and yet only bits and pieces by any one writer. The uninitiated, for whom the book is apparently intended, is likely to be lost, but anyone even slightly familiar with the field will certainly have read most of the authors from whom the excerpts are taken. Yet, some of the scholars whom Walker himself considers most important are left unrepresented. Thus, Georges Friedmann, the distinguished French student of work, is cited in most of Walker's commentary chapters and referred to in most of his bibliographical notes;