

no es posible examinar aquí". Por lo tanto sólo quedan tres. Las dos primeras provienen de la ignorancia acerca del trabajo de Skinner. Skinner jamás ha estado en contra de las teorías. Estuvo en contra de precipitarse al teorizar sin tener datos suficientes. Ahora, cuando él cree que el análisis experimental de la conducta cuenta con un cuerpo de hechos verificados y leyes establecidas lo suficientemente grande como para empezar a elaborar el enfoque teórico, el resultado es "Contingencies of Reinforcement". La "crítica" acerca de la representividad de las muestras es absurda.

En resumen, un libro de capital importancia, magníficamente traducido que será sin duda bienvenido por los numerosos estudiantes de habla hispana que lo estaban esperando desde hace años, y que sólo quedó empañado por una introducción desafortunada.

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Another Review of B. F. Skinner's *Science and Human Behavior*.
New York: Macmillan, 1953.

After going through seven printings from 1953 to 1969 in the U. S., B. F. Skinner's *Science and Human Behavior* has finally been translated into Spanish and published for distribution throughout the southern part of this hemisphere. (Cf. above review by G. Fernández.)

Science and Human Behavior is a book that seems to escape classification. Perhaps it is an introductory textbook to the experimental analysis of behavior, but it is not a textbook of psychology to the exclusion of philosophy, sociology, economics, political science, or anthropology. Unlike most textbooks it is not a compendium of experimental results collected under traditional research areas of psychology such as physiological psychology, learning and perception, social psychology, or personality. If it is thus unlike a textbook and is unconventional in its treatment of the subject area of psychology, perhaps it is not an introductory textbook to psychology at all. Perhaps it is simply the orthographic record of a part of Skinner's behavior which in this form and others introduces, explains, and clarifies how one might analyze behavioral interactions and apply certain fundamental principles of analysis to a variety of situations. As such it is a guide to self-control as well as to methods of analysis whereby constructive scientific intervention into other behavioral systems is possible.

On the other hand, the book is certainly an introduction. In a

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number of places the thread of its development is cut only to be tied into Skinner's *Verbal Behavior* (1957). In other places simple description of experimental results and techniques from which the extrapolation to complex cases is made wants the experimental demonstrations which Ferster and Skinner's *Schedules of Reinforcement* (1957) provides. The few hints at practical approaches to education are elaborated in Skinner's *The Technology of Teaching* (1968). Additional beginnings to interesting areas of analysis are extended in the essays comprising Skinner's recent *Contingencies of Reinforcement* (1969). These later works may all be read without introduction, but they may not be as well understood without the general orientation which results from a careful reading of *Science and Human Behavior*.

Science and Human Behavior is a radical departure from Skinner's first textbook, *The Behavior of Organisms* (1938), but its origin was not by means of a conceptual revolution following a miraculous conversion experience on the part of its author. It was a gradual reworking of the natural science approach to the behavior of organisms. It was a cumulation of scientific and teaching activity over more than a decade, and like most of Skinner's publications, it was subjected to the immediate consequence that follows from the verbal episodes of lecture and debate (Skinner, 1965). In sum, then, even in 1953, it was not a new idea tried out for the first time on the public in book form. Rather, it incorporates in itself the modifications of its history of reinforcement.

In his *Cumulative Record* (1961) Skinner documents how he himself utilizes the principles which he outlines in *Science and Human Behavior*. There is no reason to doubt that such practices also aided in the production of this earlier book. The principles of the control of behavior in the book are exemplified in the practical behavior of the man. In fact, the emphasis throughout the book is on the practical rather than the theoretical. When the word *theoretical* is used or implied, occasionally it is in the pejorative sense of "theoretical" being untried, untested, and unreliable as opposed to "practical" being useful, tested, and productive (cf. pp. 36, 147, 258, 278, 404).

At the same time, the book is not a practical manual which prescribes explicit procedures to follow for research methodology, for self-improvement, or for cultural reform. It describes practical situations of such complexity as government, education, and psychotherapy by means of the simpler processes noted in laboratory experimentation. Consequently, the aspects of behavior, the differen-

tiable topography of behavior, is deemphasized, and the function of behavioral-environmental interaction is emphasized. The function of such interaction is not as readily "seen" as it is the topography of the behavior or of the environment. Skinner asks the reader to look at the behavioral process in a different way. This different way is the way of the natural scientist.

Science and Human Behavior, then, is just one of Skinner's numerous publications the reading of which provides one with a particular history. One may build his own schedules on the basis of such a history so that he comes to "see" behavioral processes, including his own, in the way of natural science.

Skinner's recent publications, beginning perhaps with the utopian *Walden II* (1948) constitute a "radical behaviorism," whose advocates are simply "Skinnerians." Although this reviewer is not "Skinnerian," thus subject to the criticism of Skinnerians that he has misunderstood Skinner (all "nonSkinnerians" misinterpret Skinner), other authors plainly misinterpret Skinner. Some philosophers (e.g., Bergmann, 1957; Scriven, 1956; and Fodor, 1968) interpret Skinner's position as "theoretical" in the technical, non-pejorative sense. As a theory subject to rigorous philosophical criticism, Skinner's position is frankly untenable. One conclusion has been that his philosophical position; i.e., philosophical behaviorism; is at fault though his methodology is sound (Scriven, in Wann, 1964; and 1968). Another point of view is that his using physicalistic descriptions prevents his encompassing the domain which psychologists must study (Fodor, 1968; Rogers, in Wann, 1964). These criticisms are telling only if one equates theorizing in psychology with hypothesis-testing, experimental research with statistical inference, and the meaning of scientifically useful terms with concept definition. And if hypothesizing, inference, and conceptualization become important as specifically human and internal psychological events, then the experimental analysis of behavior becomes only a small part of the field of psychology. This line of reasoning, hence, renders doubtful Skinner's extrapolations from the laboratory to complex human affairs.

However, Skinner does not extrapolate along this line of reasoning. His extrapolation is not from simple response—simple stimulus dimensions to complex response—complex stimulus dimensions, dimensions which are theoretically specifiable. It is not extrapolation from simple conceptual mediation mechanisms to complex learning strategies that are aspects of the neurological makeup of animals and men, respectively. Instead, the extrapolation is based on function. Be-

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havior is a function of all its contingencies. It is a difficult task to clear away all of the historical-scientific-theoretical underbrush which impedes one's progress in understanding that basis for extrapolation. Learning to recognize the contingencies under whose control is the production of certain verbalizations is likewise a difficult task. *Science and Human Behavior* sets these tasks before the reader and then analyzes ways of meeting them. In the end, one can only ask whether or not these tasks and their analysis are valuable. And that question is answered only in the end, in the continuing survival of science and man.

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