METAPHYSICAL AND ETHICAL IMPLICATIONS OF DETERMINISTIC BEHAVIORISM; A CRITIQUE OF THE TECHNOLOGICAL IDEOLOGY OF B. F. SKINNER

Thesis for the Degree of Ph. D.
MICHIGAN STATE UNIVERSITY
ELFRIEDE ENGEL
1972

This is to certify that the

thesis entitled

METAPHYSICAL AND ETHICAL IMPLICATIONS OF DETERMINISTIC BEHAVIORISM: A CRITIQUE OF THE TECHNOLOGICAL IDEOLOGY OF B. F. SKINNER

presented by

Elfriede Engel

has been accepted towards fulfillment
of the requirements for

Ph.D. degree in College of Education

Frank H. Beckington III

Major professor

Date October 20, 1972

~~05~~ ~~574~~ 304

CJ014

~~JAPR 975~~ 096

~~OCT 1975~~ 053

C165

~~5 [illegible] 065~~

ABSTRACT

METAPHYSICAL AND ETHICAL IMPLICATIONS OF DETERMINISTIC BEHAVIORISM; A CRITIQUE OF THE TECHNOLOGICAL IDEOLOGY OF B. F. SKINNER

By

Elfriede Engel

1. This paper constitutes an attempt to call attention to the ideological basis of current controversies between a technologically oriented and a humanistically oriented faction in the field of education. Humanists are more likely to explicitly acknowledge such an ideological basis, whereas technologists are more prone to introduce their ideological position implicitly via so-called "scientific" definition of teaching and the teaching relationship. Current controversies in education are seen as part of a wider cultural debate and philosophical evaluation of technology and its effects on the quality of human life. Issues raised in this wider debate affect not only the recommended institutionalization of teaching techniques and practices, but methodologies employed by the behavioral sciences as well.

logical s
Marcuse,
critics s
turally p
societies
operates
determini
which, or
of all ev
lable) mo
the restr
externall
gation of
lack of i
activitie
tution of
a variety

2

mental id
and man's
thought o
cist Max
B. F. Ski
in outloo
activitie

Certain ideas advanced by critics of the "technological society," for example, Jacques Ellul, Herbert Marcuse, and Erich Fromm, have been sketched. These critics suggest that a technological orientation is culturally predominant in the endeavors of modern western societies, and that this technological orientation operates within a universe of discourse indicative of a deterministic metaphysical-ethical monism. A monism which, on the metaphysical side, calls for the reduction of all events to the level of overtly measurable (manipulable) movement and which, on the ethical side, calls for the restriction of value (the desirable) to the level of externally controlled event. With regard to the investigation of human behavior, such a monism entails a complete lack of interest in the psychological dimension of human activities and results in what Ellul calls the substitution of a universalized "technological necessity" for a variety of human motives or purposes.

2. An attempt is made to briefly indicate fundamental ideological differences in outlook on the world and man's relation to it, as it is reflected in the thought of the philosopher Charles S. Peirce, the physicist Max Planck, and the pronouncements of the behaviorist B. F. Skinner. These fundamental ideological differences in outlook lead to divergent conceptualizations of human activities in general, and to divergent conceptualizations

of the r
lar. Th
Planck)
dimensio
judgment
whether
this out
establis
phenomer
cal), be
a demons
human pr
power.
(Skinner
dimensio
making h
recognit
mises wi
nomencla
ditional
and a ps
movement
pose, ar
treated
tiations

of the nature and aim of scientific activities in particular. The human-oriented ideological outlook (Peirce, Planck) attributes importance to the psychological dimension of man, the aesthetic judgments, and the judgments of value which enter into human activities, whether they be scientific or otherwise. In consequence, this outlook does not dismiss out of hand traditionally established distinctions between an understanding of phenomena (theoretical) and control of phenomena (practical), between an explanation of events (hypothetical) and a demonstration of events (actual manipulation), between human problems of knowledge and political problems of power. The technically oriented ideological outlook (Skinner) attributes importance solely to the physical dimension of events, objectifies man in the sense of making him an object, but, at the same time, demands recognition and acceptance of its own ideological premises with the fervor of religious certitude. In the nomenclature of the technically oriented ideology, traditionally established distinctions between a physical and a psychological dimension of man, between human movement in space and human conceptualization of purpose, are either outrightly declared obsolete or are treated in verbal practice as inconsequential differentiations.

the ideo

the majo

whose "s

ideology

cation f

the titl

justific

behavior

things a

ceptual

(manipul

attainme

behavior

characte

for the

by their

events.

determir

organisr

causal r

environr

cosmic a

eliminat

other t

realm o

3. The technological outlook is exemplified in the ideology called deterministic behaviorism. One of the major proponents of this ideology is B. F. Skinner, whose "science of behavior" constitutes both, the ideology of deterministic behaviorism and the justification for it. Whatever activities are carried on under the title "science of behavior" are carried on, which is justification enough for Skinner. The "science of behavior" proceeds from a particular mode of conceiving things and events, which is simply deemed the proper conceptual outlook for a truly "scientific" investigation (manipulation) of behavior on the one hand, and for the attainment of truly "scientific" results (control of behavior) on the other. Skinnerian undertakings are characterized by their utilization of "analytical unit(s)" for the "scientific analysis" of behavioral relations and by their reliance on closed definitions of "behavior" events. The "analytical unit(s)" stipulate a universal deterministic-teleological causal relation between organisms and their environment(s). Presumably this causal relation manifests itself in the form of an environmental method of response conditioning, either cosmic and/or Skinnerian. The definition(s) of "behavior" eliminate from the realm of meaningful activity anything other than an overt "response" (movement) and from the realm of meaningful interaction anything other than an

overt "
forcer.
behavio
empiric
of exte
and tec

general
behavio
practic
of beha
vides t
result;
able to
"scienc
of the
method
vidual
social
behavi
in edu
which
social
its ow
value

overt "response-linked-to-environmental-stimulus/reinforcer." The analytical nature of the "science of behavior" forestalls utilization of disconfirming empirical evidence, while its single-minded valuation of external control over behavioral events exempts methods and techniques from questioning.

4. Demands for an educational technology are generally inspired by the ideology of deterministic behaviorism and are justified with reference to the practical results achieved by a Skinnerian type "science of behavior." The "science of behavior" presumably provides the technology for the attainment of a desired result; something a philosophy of education has not been able to accomplish. In contrast to philosophy, the "science of behavior" offers one unilateral definition of the "teaching" relationship, one proper teaching method, and the promise of external control over individual responses. An attempt is made to point to the social-political consequences of the deterministic behavioral position. The technological orientation in education, like the "scientific" foundation upon which it relies, aims in the direction of a closed social system, a system which attains its meaning from its own internal consistency, and which places supreme value on external control over individual behavior. It

is s

syst

orie

the

of t

serve

count

contr

is suggested that the institutionalization of such a system constitutes a major change in political value orientation, a change which places greater value on the requirements of the system than on the requirements of the individual human beings the system supposedly serves. It is also suggested that this change runs counter to a social contract designed to limit external control over the behavior of individuals.

METAPHYSICAL AND ETHICAL IMPLICATIONS OF DETERMINISTIC BEHAVIORISM; A CRITIQUE OF THE TECHNOLOGICAL IDEOLOGY OF B. F. SKINNER

By

Elfriede Engel

A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

College of Education

1972

A man, though wise, should never be ashamed
of learning more, and must unbend his mind.
Have you not seen the trees beside the torrent,
the ones that bend them saving every leaf,
while the resistant perish root and branch?
And so the ship that will not slacken sail,
the sheet drawn tight, unyielding, overturns.
She ends the voyage with her keel on top.
I'd say it would be best if men were born
perfect in wisdom, but failing this
(which often fails) it can be no dishonor
to learn from others when they speak good sense.

--Sophocles, Antigone

ACKNOWLEDGMENTS

The writer wishes to express special thanks to Dr. Frank H. Blackington III, chairman of her guidance committee, and to Dr. Lewis Zerby for time spent in offering comment, discussing ideas, and giving support in hours of anxiety; her thanks to Dr. Marvin Grandstaff and Dr. Keith Anderson for serving on her committee.

TABLE OF CONTENTS

CHAPTER I

INTRODUCTION

The study of human history suggests, to a gentle sceptic, that man has distinguished himself from other animals through the construction of elaborate myths, theories, or the like creations of his intellect, which serve to interpret his world and through which he delineates "reality." With the help of these, his "rational" constructs, man may convince himself, individually or collectively, that he has conquered the vicissitudes of uncertainty and that he has eliminated doubt as an integral part of the human condition. Wise men throughout the ages have warned about the consequences of any such conviction and have been speculating about the penalties engendered by unwarranted feelings of certainty, feelings variously referred to as "hubris," "arrogance," or "delusion." Whatever the name for the psychological phenomenon, ill results were thought to attend human judgments thus distorted by over-confidence. Judgments of this type presumably called forth the retribution of the gods or precipitated some other form of

clash with a reality beyond human control. The message of the wise seems clear enough for those disposed to listen: Man's quest for certainty must be tempered by awareness of human fallibility; the arrogance of certainty must forever be contained by the judiciousness of doubt.

If someone is inclined to heed the message of the wise, human history provides a record studded with examples of delusions, with instances of yesterday's "fact" turned into tomorrow's "fiction," and with case studies of myths once believed to be descriptions of "reality." Yet, in the record of history, those obsessed with the attainment of certainty are rarely tempted to discern the components of human existence which furnish the material for tragedy. Instead, they view the failings of the past as infinitely correctible in the future, apparently under the assumption that human short-sightedness is a malady to which man has become immune since the invention of glasses. The modern devotee' of certainty tends to exhibit an untempered faith in the relentless workings of "progress" through the handmaidens of "science" and "technology." Any reminders, that "short-sightedness" might be used metaphorically to call attention to limitations in human awareness or knowledge, are not graciously received by the modern devotee' of certainty and are frequently

dismissed by him as "unscientific," "unimportant," or both. Alas, a certain type of "scientist" may well be the contemporary version of the pied piper, whose tune enchants the children of our age into compliance with his schemes, even though such compliance may lead to the cave from which there is no escape. The warnings of the wise appear to be lost on many an "expert" and his followers, who decide with temporary impunity that these warnings are "meaningless," "impractical," or otherwise inconducive to "progress."

For the humanist in any area of endeavor, the modern quest for certainty is bound to be imbued with an aura of the familiar. It is as if a well-known, ancient play were once again performed in current dress and language. Of yore, performers seemed to wear a monk's cowl, preach predestination, and insist on the mortification of the flesh for the salvation of the spirit. Today's performers tend to appear in a laboratory coat, advocate some form of determinism, and insist on the renunciation of a "fictitious" spirit for the survival of the flesh. In keeping with the tradition, the modern performers exhibit an all but unshakeable faith in the self-evident TRUTH of their basic premises, freely peddle THE roadmap to salvation, and equally freely dismiss alternative mappings of roads as "inefficient," if not "nonsensical."

For the humanist in education, contemporary cultural trends may well evoke apprehensions about an ancient play being performed with a new twist. In our technological age it seems entirely feasible that individual cases of "hubris" may be magnified beyond correctable proportions through large-scale institutionalization of certain "techniques." Publications such as Educational Technology, with their partisan approach to the uncritical extension of technology into the area of human development, are hardly conducive to the amelioration of a profound feeling of unease. The technologist's pre-occupation with standardization of teaching techniques, stipulation of educational goals in terms of "behavioral objectives," and "scientific measurement" of the amounts of learning produced in students, is hardly geared to increase the humanist's peace of mind. He may vaguely, or not so vaguely, wonder why the rising number of criticisms of a technological order have not had more of an impact on certain types of educational thought. To move more and more toward education construed in terms of a "technology," with the approach to human beings that such a move entails, could lead to the rigidification of an oversimplified "scientific" conceptualization of human nature at best, or could turn out to be a very costly cultural error at worst.

The fundamental philosophical question in the field of education, shirked or ignored by the technologist but persistently entertained by the humanist, is the question whether "scientific techniques" are "value-free" and whether their application and development into an "educational technology" are socio-politically "desirable." It would appear that the psychological certitude required to ignore this dual question, springs from either a profound faith in the innate goodness of technology or from a short-sightedness induced by intellectual myopia.

CHAPTER II

THE GENERAL BACKGROUND FOR CONTROVERSY

> Why does man have such faith in technology? To ask this question requires one's adopting the same attitude as the questioning of God's existence would have required during the Middle Ages.
>
> --Jacques Ellul

In an age of specialization and specialists, one may have to expect that many intellectual skirmishes will be fought on the battlefield of an undeclared ideological war. While these intellectual skirmishes may have their origin in quite fundamental disagreements, or very basic differences in outlook on the world, such differences are frequently obscurred when improperly focused. Many intellectual skirmishes are seemingly fought over trivia and appear petty from a properly focused perspective. Current bickering in the field of education is a case in point. A multitude of guerilla actions and intellectual skirmishes between a technologically oriented and a humanistically oriented faction of "experts" obfuscate a larger, ideological war. Unfortunately, this state of

affairs tends to perpetuate warfare and is not conducive to either a truce or a compromise settlement of the basic conflict.

Why, indeed, does man have such faith in technology? To ask this question is to provide a more macroscopic perspective, so generally ignored or lacking, and a more suitable focus for a major ideological conflict. The faith in technology is discernible enough in continuing attempts to extend the sovereignty of "techniques" to all areas of life and human endeavor. One might reasonably conjecture that the faith in technology evolved over time. Most likely the faith gathered strength parallel with the application of techniques of production and the techniques of organization which, in combination, made available to modern man a vast array, as well as spectacular quantities, of products and services. The tangible, quantifiable "success" of applied techniques is hardly debatable, whether such "success" is measurable in numbers of cars produced, amounts of government services supplied, or throngs of students processed through schools. The faith in technology appears to maintain itself and to gain converts, in spite of an increasing number of heretical voices raised in favor of a Reformation. Heretics neither wish to belittle the achievements nor do they deny the "success" of technology. However, they are concerned lest application of techniques

be uncritically extended into all areas of human endeavor and "technology" elevated to THE approach to the world and to human existence.

What heretics fear and warn about amounts to the evolution of a closed cultural system, institutionalized practices nourished by habitualized orientation of thought, which would constitute the tangible manifestation of a highly restrictive metaphysical-ethical monism.[1] A rising number of critics, from various fields of inquiry, have pointed to disconcerting trends in precisely such a direction. The term "technology" usually means the organized ensemble of specific techniques, the organized ensemble of systematized practices, whereby available resources are used to achieve results. But, as heretics are wont to point out, "technology" has an important belief-dimension as well. The very systematization or rationalization of practices into "techniques," along with the organization of such techniques into more and more comprehensive "technologies," initially requires, but subsequently engenders almost automatically, a certain

---

[1] On the metaphysical side, this monism tends to restrict "reality" to the directly observable phenomenon in the external world. It ignores the problem connected with the range of perceptual and conceptual biases in defining the "objectively measurable." On the ethical side, this monism elevates "objective measurability" to the highest value to be pursued by man. It denigrates the "qualitatively felt" difference to a "subjective irrelevance" or mere "emotivism."

set of attitudes.[2] This set of attitudes seems to be characterized by a metaphysical outlook on the world that insists on the definition of "reality" in terms of available techniques for its interpretation. From an ethical perspective, this same set of attitudes tends to declare "efficiency" the highest value, i.e., the application of techniques is seen as an end worth achieving for its own sake.

According to Jacques Ellul,[3] for example, the technicization of society has become a self-directing phenomenon. When he speaks of the "technological phenomenon," he finds it characterized by "the quest of the one best means in every field," a search for "the most efficient method" in every field of human endeavor. This one "best means" or "most efficient method" is

---

[2]Techniques tend to focus on problems in terms of manipulable or controllable phenomena in the external world, components which are perceived as malaligned and in need of restructuring for the attainment of a desired result.

[3]Ellul is concerned with the rise and spread of a metaphysical-ethical monism from the perspective of the sociologist-historian. Some time ago, Max Weber called attention to bureaucratic organizations and their "written policy" orientation, which tends to stereotype situations and eliminate diversity of approach to problems. Ellul seems to follow Weber's lead but envisions the expansion of the bureaucratic organizational structure and its practices to all walks of life.

precisely the "technique." As the "technological phenomenon" takes hold in a society,

> It is no longer the best relative means which counts, as compared to other means also in use. The choice is less and less a subjective one among several means which are potentially applicable. It is really a question of finding the best means in the absolute sense [italics mine] . . .[4]

Once a technique has been found, which is considered the most efficient means of all those hitherto employed or in competition with it in a given area of human endeavor, any further

> . . . choice among methods, mechanism, organizations, and formulas is carried out automatically. Man is stripped of his faculty of choice and he is satisfied.[5]

Acceptance of the technique inaugurates what Ellul calls an "automatism of technical choice." Henceforth, neither the means to be employed nor the end to be attained are subject to the indeterminacies of human judgment and selection. The end to be attained is "efficiency" as defined in terms of the technique to be employed. Thus, the "automatism of technical choice" is responsible for the "autonomy" of technique and brings about a self-directing "technological phenomenon" which absorbs human choice into the circle of "technological necessity."

---

[4] Ibid., p. 21.

[5] Ibid., p. 82.

Ellul suggests that the technological society is governed by a religious reverence for "technique,"[6] by an unquestioned dedication to the service of "technique," which leads to the acceptance of "technological necessity" as "natural" necessity in general. Human autonomy and judgment are replaced by the super-human autonomy of "technique" that defines and prescribes the course of events. "The complete separation of the goal from the mechanism, the limitation of the problem to the means, and the refusal to interfere in any way with efficiency; all this . . . lies at the basis of technical autonomy."[7] When Ellul speaks about the "technological phenomenon," he points to a way of life which shapes man's outlook on the world and confines his vision within the framework of its own values. "Technique" no longer serves man to realize a variety of human ends but becomes the object of faith that dictates what these ends must be.

---

[6]As John Wilkinson, the translator of Ellul's, Technological Society, commented: "Since the religious object (technique) is that which is uncritically worshipped, technology tends more and more to become the new god. This is true for all modern societies, but especially so for Communist societies, since Marxism, in Ellul's analysis of it, consciously [italics mine] identifies the material infrastructure, upon which the social superstructure is raised, with technology," pp. xi-xii.

[7]Ellul, The Technological Society, p. 133.

The gist of Ellul's writing lies in the warning that technology has its own implicit values, that it generates its own "necessity." Until and unless these values are exposed through cultural analysis, brought fully to human awareness, and critically reviewed by human consciousness, the blind necessity inherent in the "technological phenomenon" will unconditionally dictate the course of events. In the foreword to the revised American edition of The Technological Society, Ellul made the following appeal to his readers:

> In the modern world, the most dangerous form of determinism is the technological phenomenon. It is not a question of getting rid of it, but, by an act of freedom of transcending it. How is this to be done? I do not yet know. That is why this book is an appeal to the individual's sense of responsibility. The first step in the quest, the first act of freedom, is to become aware of (technological) necessity.[8]

Jacques Ellul is by no means the only critic or commentator concerned with some sort of analysis and evaluation of the technological society. What appears to characterize all humanistically inclined commentators is a common concern with the effects of technology and the technological way of life on the individual human being; his life-style, range of choices, emotional needs, his differing responses to demands for conformity, and his varying potential for dealing with change. Where Ellul is primarily concerned with pointing to a "technological

---

[8] Ibid., p. xxxiii.

necessity" that has come to dictate the relationship between man and his environment, other critics have stressed the reduction of the concept of "man" to a mechanistic stereotype, to a construct consistent with the demands of "technological necessity" and the framework of values inherent in the technological way of life.

Herbert Marcuse is responsible for the phrase "one-dimensional man,"[9] a summarization of his contention that the technological way of life calls for people who find their soul in their automobile, hi-fi set, split-level home, people who derive their personal identity from the external dimension of assorted material possessions and rationalized social transactions. In Freudian terms,[10] the technological way of life works towards the obliteration of the Self (Ego) as mediator between "outer" and "inner" reality, while it encourages the immediate

---

[9]Marcuse is concerned with the rise and spread of a metaphysical-ethical monism from the perspective of social psychology. Marcuse follows a direction indicated by Freud in one of his later books, Civilization and Its Discontents, and is primarily concerned with the effects of a socially closed "universe of discourse" on the development of thought and behavior in the individual. In Freudian terms, he is interested in the shaping of the id by the superego.

[10]Marcuse utilizes Freud's Id-Ego-Superego conceptual scheme in his analysis of social interaction. The elimination of the Ego would amount to an elimination of the individual judgment, which mediates between felt needs and wants of the individual and their satisfaction or sublimation within the context of society.

identification of the individual with his society. According to Marcuse:

> This immediate, automatic identification (which may have been characteristic of primitive forms of association) reappears in high industrial civilization; its new "immediacy," however, is the product of a sophisticated, scientific management and organization. In this process, the "inner" dimension of the mind in which opposition to the status quo can take root is whittled down. The loss of this dimension, in which the power of negative thinking--the critical power of Reason--is at home, is the ideological counterpart to the very material process in which advanced industrial society silences and reconciles the opposition.[11]

"One-dimensional man" is held captive by a "technological necessity" which anesthetizes his power of negative thinking, i.e., his ability for critical evaluation, while it furnishes the bribe for his need of material comforts. The technological way of life does result in material prosperity for many, and as such,

> It is a good way of life--much better than before--and as a good way of life, it militates against qualitative change. Thus emerges a pattern of one-dimensional thought and behavior [italics mine] in which ideas, aspirations, and objectives that, by their content, transcend the established universe of discourse and action are either repelled or reduced to terms of this universe.[12]

In fine, "one-dimensionality" of thought and behavior is characteristic of the man who operates within the universe

---

[11]Herbert Marcuse, One-Dimensional Man: Studies in the Ideology of Advanced Industrial Society (Boston: Beacon Press, 1968).

[12]Ibid., p. 12.

of discourse established by "technique" and firmly governed by "technological necessity."

Erich Fromm is another one of the commentators who express concern about the "dehumanizing" effects of technology on the individual human being.[13] But where Marcuse tends to stress the social-technological forces working toward the diminution of Self (Ego), Fromm is more prone to emphasize the differing psychological make-up of men. This emphasis leads him to explore the psychological foundation whence individual preferences and ethical values take their origin.[14] For Fromm, the psychological need for certainty seems to precede the need for autonomy in the development of the individual human being, but the developed need for autonomy does not preclude the need for certainty. Man is characterized not only by the potential to be free and to make autonomous

---

[13]Fromm is concerned with the rise and spread of a metaphysical-ethical monism from the perspective of psychology and individual stages of growth and development. He is primarily interested in the individual's need for "certainty" and his ability to cope with "doubt." Touches on points also covered by Charles S. Peirce in his essay "The Fixation of Belief."

[14]For extensive treatment of this issue, see Erich Fromm, Man for Himself: An Inquiry into the Psychology of Ethics (New York: Holt, Rinehart, and Winston, 1960).

choices; he may actively seek to escape from the responsibility such freedom entails.[15]

> Man is not equipped with a set of instincts that regulate his behavior quasi-automatically. He is confronted with choices, and this means in all-important matters with grave risks to his life, if his choices are wrong. The doubt that besets him when he must decide . . . causes painful tension and can seriously endanger his capacity for quick decisions. As a consequence, man has an intense need for certainty; he wants to believe that there is no need to doubt that the method by which he makes his decisions is right.[16] (italics mine.)

Man's escape from freedom is facilitated by the availability of an Authority which provides the "technique," or infallible method for decision-making , an Authority which eliminates the tension of doubt from the life of the individual.

Ellul, Marcuse, and Fromm are outright critics of the technological way of life, as it manifests itself in uniformity of products, conformity of outlook on the world, and methodological rigidity. Alvin Toffler, author of the current best-seller Future Shock decries: " . . . the anti-technological rhetoric of the Ellul's and Fromm's, the Mumfords and Marcuses . . . "[17] Yet,

---

[15]Fromm devoted an entire book, Escape From Freedom (New York: Farrar and Rinehart, Inc., 1941), to this topic.

[16]Fromm, The Revolution of Hope, p. 49.

[17]Alvin Toffler, Future Shock (New York: Bantam Books, 1971), p. 319.

Toffler seems to agree that the individual human being must somehow be switched back into the ongoing process of technological change.[18] One might speculate that it is relatively unimportant whether processes of technological change are said to have a stultifying or an utterly confusing effect on human beings, whether individuals are said to suffer from boredom and "alienation" or from too many superficial commitments and "future shock." Neither an excess of choice nor a deficiency of choice admittedly seem to agree much with individual well-being; both are seen as conducive to the same physical and psychological break-down of people. Interestingly enough, Toffler claims to defend technology but does not refute Ellul's basic contention that the "technological phenomenon" needs conscious human evaluation and direction. Neither does Toffler repudiate the basic assumption of the critics that diversity is desirable, and that choices over life-style should be options available to individuals. In short, Toffler appears to take human freedom and

---

[18]Toffler's reference to "anti-technological rhetoric" constitutes rather a gross oversimplification. Neither Ellul, Marcuse, nor Fromm are "anti-technology"; rather they are pro-human. From this perspective they are concerned, just as Toffler is, with the effects of technological change on man. Again, just like Toffler, they call for the subordination of technological change to the demands of "human nature." That is to say, the physical and psychological well-being of people is pursued as a primary value, not the uncritical extension of techniques and technology.

individual control for granted in the technological society, whereas Ellul and others wonder to what extent such freedom and control may atrophy from lack of opportunity for exercise.

Perhaps other defenders of the technological way of life are equally unaware of possibly inherent value-conflicts between "efficiency" and "human growth," between the "objective," rationally prescribed "technique" and the "subjective," situationally chosen "good." Whatever the case may be, the defenders of the faith are not generally characterized by the belief that diversity of approach is desirable, except in a relatively trivial sense. In the field of education, the defenders of the faith are rather given to the advocation of one method to be applied, one approach to be taken to the relationship called "teaching." One leading educational technologist, for example, made the following introductory remark in one of his articles:

> Educational technology is best defined as a concept reflected in the attitudes held by people who address themselves to means-ends relationships. Presumably, in the schools, the means are the instructional sequences and the campus environments, the ends are the learning achieved by the students.[19]

What is truly remarkable about this purported definition of educational technology seems to be a certain naiveté.

---

[19]Arthur M. Cohen, "Technology: Thee or Me? Behavioral Objectives and the College Teacher," Educational Technology, X, No. 11 (November, 1970), p. 57.

The first sentence of the definition would include in the class of "educational technologists," any person whatsoever who has given some forethought to what means might be employed to achieve a certain result. As definitions go, the first part of this one appears to be all-inclusive, hence fails to fulfill the function of a definition. The second sentence of the purported definition presumes that the "means are the instructional sequences and the campus environments" while the "ends are the learning achieved by the students."[20] (italics mine.) To all appearances, the second sentence implicitly stipulates what means and what ends interest the educational technologist and must interest everybody else. One may wonder whether it takes a true believer to be so oblivious of his own biases and so immune to contamination by other possible conceptualizations of educational relationships.

Cohen's article is about the use of "behavioral objectives" in teaching and, characteristically enough, decries the resistance shown to efforts of educational technologists. According to Cohen:

---

[20]What is remarkable in this purported definition is the absence of any reference to human-type teachers and the narrow interest in human-type students solely on the basis of "learning achieved" (meaning: responses acquired). Perhaps fortunately, Cohen mentions that "few faculty members at any level of schooling think in these terms." Naturally, Cohen attributes this to their "feelings of self-centeredness" and finds this a subject for reproach.

> The use of well-defined instructional objectives offers a case in point. For decades educational technologists have been exhorting instructors to teach toward "specific" or "behavioral" objectives.[21]

But many teachers are apparently opposed to a "technological stance" in education, which seems to puzzle him.

> Why this resistance, this apparent fear of technology as a betrayal of humanism? Do avowedly anti-technological instructors really believe they alone hold the keys to humanistic education? What gives rise to their shrinking away from technology in general and, in the case mentioned, the use of specific objectives in particular? Is it a failure to understand the concepts related to means and ends? Or simply an undifferentiated antipathy toward the unfamiliar?[22]

Cohen's verbal expression of puzzlement was worth quoting at some length, for question one, two, and three are followed by a disguised answer. Either these teachers do not understand or they have an "undifferentiated antipathy toward the unfamiliar."[23] It does not seem to occur to Cohen that these teachers might understand relations between means and ends very well but reject

---

[21] Cohen, "Technology: Thee or Me."

[22] Ibid., p. 57.

[23] There is at least one other conceivable reason for teacher resistance to the recommendations of Cohen and others in educational technology. This reason may well have to do with the attitude taken toward teachers, as reflected in Cohen's recommendations at the end of his article. Cohen feels obliged to "call into question the entire move toward instructor-made or instructor-selected objectives," i.e., he calls into question individual competence and judgment.

his conceptualization of the means-ends relationship in favor of another.

As a rule, Cohen and other educational technologists tend to operate from the premises of "behavioral psychology," also called "the science of behavior." Behavioral psychology may trace its ideological origin to the thought of men like Julien de la Mettrie and Baron Holbach, who speculated that "man is a machine."[24] Behavioral psychology is also indebted to the investigations of the Russian physiologist, Ivan Pavlov, has more recently culminated in the work of John B. Watson, and was further perfected by B. F. Skinner. Of particular importance to the educational technologist is the so-called "learning theory" of behavioral psychology, which serves to provide the "scientific" foundation for a technology of education.

---

[24]B. F. Skinner, "The Machine That Is Man," Psychology Today: The Magazine about Psychology, Society, and Human Behavior, II, No. 11 (April, 1969), 63-64; A speculation repeated in our day and age by B. F. Skinner: "Man is a machine, but he is a very complex one. At present he is far beyond the powers of man to construct--except, of course, in the usual biological way. . . . But as our understanding of human behavior increases we appeal less and less to explanatory fictions (i.e., concepts of a human "self" of various types) and we can then accept the fact that the essential differences between machines and men concern componentry." For a brief anthology and historical development of the deterministic-behavior position, see Floyd W. Matson, ed., Being, Becoming, and Behavior: The Psychological Sciences, Part II (New York: George Braziller, Inc., 1967).

In 1968 Professor Skinner published a book entitled The Technology of Teaching. On page 5 of this book, the reader is told that:

> So far as we are concerned here, teaching is simply the arrangement of contingencies of reinforcement. Left to himself in a given environment a student will learn, but he will not necessarily have been taught. . . . Teaching is the expediting of learning; . . .[25]

At least for the purposes pursued in the book, it would seem that "teaching" has been defined as "the arrangement [italics mine] of contingencies of reinforcement" in the student's environment, i.e., school. Somewhat further on the reader is informed that:

> Some promising advances have recently been made [by science] in the field of learning. Special techniques have been designed to arrange what are called contingencies of reinforcement--the relations which prevail between behavior on the one hand and the consequences of that behavior on the other--with the result that a much more effective control of behavior has been achieved.[26] (italics mine.)

At this point the thoughtful reader may engage in the following speculation: If the definition of "teaching" as "arrangement of contingencies of reinforcement" is accepted, then "special techniques" for the arrangement of such contingencies are available. And if these special techniques are utilized, then "a much more effective

---

[25] B. F. Skinner, The Technology of Teaching (New York: Educational Division, Meredith Corporation, 1968), p. 5.

[26] Ibid., p. 9.

control of behavior" can be achieved in schools, according to the pronouncement by Professor Skinner. Such speculation by the reader brings out the point that the acceptance of Skinner's definition of "teaching," which would lead to the utilization of his recommended "techniques," is conditional on the value judgment that the aim of teaching should always be "a much more effective [external] control of behavior" of students.

The thoughtful reader may be permitted to wonder whether he has not hit upon an example of Ellul's "technological phenomenon" in the field of education. "Teaching" has been traditionally viewed as a complex relationship between instructor and student. This relationship might sometimes aim at the outright control of student behavior and at other times it might aim at some kind of reflection by the student on his own behavior.[27] The universal characteristic of the teaching relationship, discernible under any and all conditions, has traditionally proved either elusive or difficult to ascertain. To hear that in general "teaching is simply the arrangement of contingencies of reinforcement" may be somewhat surprising, unless one has faith in "technique" and is prepared

---

[27]The aims of teaching, as here indicated, follow a general distinction between control and self-control. Control suggests an exercise of power by someone over someone else, who is either unable or unwilling to govern certain of his activities. Self-control suggests the exercise of his own judgment by an individual in governing his own activities, i.e., it is an inner control.

to let available techniques for the arrangement of "contingencies of reinforcement" determine both, the definition and the aim of the "teaching" relationship. Given this case, the invocation of "science" notwithstanding, "technological necessity" is allowed to dictate the nature and purpose of human interaction in education. "Technique" is accepted as the higher authority which definitively decrees how "reality" must be perceived by people and how their "choices" must be made.

Scepticism or doubt about the divine, unquestionable status of "technique" in general, and the "technique for the arrangement of contingencies of reinforcement" in particular, is liable to call forth a din of rhetoric, liberally sprinkled with references to "science." Whether the faint-hearted are convinced by overpowering invocations of authority, or merely silenced into a more or less resentful conformity, remains a moot point. The genuine sceptic, however, will be predisposed to pursue the analysis of the claims made. That is to say, the sceptic in the field of education is prone to investigate the so-called "scientific" foundation for B. F. Skinner's definition of the "teaching" relationship, insofar as it has been connected with "promising advances . . . in the field of learning." The doubter tends to be propelled by his desire to know what these "promising advances" are; he may also be curious whether a "more effective external

control of behavior" is assumed to be an inherent value in the cosmological scheme of things and on what grounds such an assumption may be justifiable.

CHAPTER III

THE SCIENTIFIC FOUNDATION FOR EDUCATIONAL TECHNOLOGY

> The life of science is in the desire to learn. If this desire is not pure, but is mingled with the desire to prove the truth of a definite opinion, or of a general mode of conceiving things, it will almost inevitably lead to the adoption of a faulty method.
>
> --Charles Sanders Peirce[1]

Scientists, or what are called "scientists," appear to be no more homogeneous in attitudes than any other group of human beings. To all appearances, their basic outlook on the world, and hence their approach to "scientific" investigation, varies or falls short of uniformity. Some scientists seem to be primarily motivated by a "desire to learn" more about the world of

---

[1]Charles Sanders Peirce, "What Is Science," in Essays in the Philosophy of Science, ed. by Vincent Thomas (New York: The Bobbs-Merrill Company, Inc., 1957), p. 192; Quote taken from the essay "What Is Science," in which Peirce associates "the essence of science" with a human "desire to learn." To Peirce, "science" is not a static record of achievement; it is an ongoing process of inquiry and as such is shaped by the aesthetic-ethical orientation of the inquirer toward the world of phenomena. "Mere knowledge, though it be systematized, may be a dead memory; while by science we habitually mean a living and

phenomena and, consequently, pursue a wider understanding of events or relationships. Other scientists seem to be more motivated by a "desire to prove the truth of a definite opinion" about the world of phenomena and, consequently ,devise authoritative definitions of events or relationships. Depending on which attitude predominates, "scientific" investigation may thus be construed to be either a relatively open-ended "search for truth" that aims for explanation, or a relatively close-limited "search for variables" that aims for control.

Charles Sanders Peirce, the American philosopher of science, was of the opinion that investigation construed as anything other than a continuous "search for truth" was bound to produce dogma. Peirce thought of "science" as a living process of inquiry, a process which is kept alive by the "scientific men" imbued with a "desire to learn" more about nature as "a cosmos, so admirable, that to penetrate to its ways seems to them the only thing that makes life worth living."[2]

---

growing body of truth. We might even say that knowledge is not necessary to science. . . . That which constitutes science, then, is not so much correct conclusions, as it is a correct method. But the method of science is itself a scientific result . . . not even this method ought to be regarded as essential to the beginnings of science. That which is essential, however, is the scientific spirit, which is determined not to rest satisfied with existing opinions, but to press on to the real truth of nature." (italics mine.)

[2] Ibid., p. 195.

For Peirce, "scientific" inquiry thus had two dimensions: one dimension extended into the attitude and motive for investigation by the scientist; the other dimension extended into an independently existing "reality" of orderly phenomena.[3] As Peirce envisioned it, the scientist's "desire to learn" would neither allow methodological rigidity, or rigidity in "a general mode of conceiving things," nor would it allow foreclosure of the "search for truth" through substitution of an ulterior motive for investigation. The "search for truth" was not construed to have either a specific truth or a pre-definable end in view; it was an end-in-itself for Peirce. " . . . if a man occupies himself with investigating the truth of some question for some ulterior purpose, such as to make money, or to amend his life, or to benefit his fellows, . . . he is not a scientific man."[4] It would seem that Peirce's ideal "scientific men" are obliged to consider whether they might have pre-conceived ideas about the

---

[3]For purposes of distinction, one might say that Peirce recognized a "subjective psychological" dimension in all types of inquiry, as well as an "objective empirical" dimension. Particularly in his essay "The Fixation of Belief," he suggests that scientific inquiry to be "scientific" must operate from methods which attempt to balance one dimension against the other. He also suggests that most methods of inquiry are geared toward fixed beliefs and the psychological security to be derived from these, rather than tentative beliefs and a cultivated state of psychological doubt.

[4]Peirce, Essays in the Philosophy of Science, p. 196.

exact structure of "a cosmos," or whether their investigations are distorted by some ulterior purpose.

It is interesting to note that one of the great scientists, the physicist Max Planck, speculated about the nature of the scientific enterprise: " . . . there is an irrational core at the center of science which no intelligence can solve, and which no modern attempt at limiting by definition the task of science can remove."[5] (italics mine.) Much like Peirce, Max Planck was aware of what might be called a "psychological dimension" in all human endeavors, including our "scientific" ones. He considered it "impossible to make a clear cut between science, religion, and art," since all three contribute elements to human judgment.[6] " . . . In dealing with the structure of any science, and in discussing its most suitable arrangement, a reciprocal interconnection between epistemological judgments and judgments of value was found to arise, . . . no science can be wholly disentangled from the personality of the scientist."[7]

---

[5]Max Planck, The Philosophy of Physics, trans. by W. H. Johnston (New York: W. W. Norton & Company, Inc., 1936), p. 115.

[6]In some of his later essays, Peirce also seems to point to a connection between the "desire to learn" and some type of religious sentiment or reverence for the "circumambient All," which supports Planck's notion that a clear cut between science and religion may not be possible.

[7]Planck, The Philosophy of Physics, p. 34.

The "i

connec

ments

ing ab

Max Pl

nator

certai

logica

ently

An
br
ex
is
Th
It
th
mo
ev
da
of
in

Given

that th

for tru

mentio

The
to
th
is
as
me

ful o
John
p. 11.

The "irrational core at the center of science" is thus connected with the "epistemological judgments and judgments of value" made by the scientist when conceptualizing about the nature and arrangement of phenomena. Since Max Planck was a scientist of some stature and the originator of "quantum theory," he presumably had at least a certain amount of introspective awareness of the "psychological dimension" in the scientific enterprise. Apparently he refers to his personal experience when he says:

> Anyone who has taken part in the building of a branch of science is well aware from personal experience that every endeavor in this direction is guided by an unpretentious but essential principle. This principle is faith--a faith which looks ahead. It is said that science has no preconceived ideas: there is no saying that has been more thoroughly or more disastrously misunderstood. It is true that every branch of science must have an empirical foundation: but it is equally true that the essence of science does not consist in the raw material but in the manner in which it is used.[8]

Given Max Planck's attitude, one would expect him to say that the scientist is committed to a perpetual "search for truth," with emphasis on search. He does, indeed, mention that:

> The aim of science is . . . an incessant struggle toward a goal which can never be reached. Because the goal is of its very nature unobtainable. It is something that is essentially metaphysical and as such is always again and again beyond each achievement.[9]

---

[8] Ibid., p. 121.

[9] Planck as quoted in Hubert Bonner, On Being Mindful of Man: Essay Toward a Proactive Psychology, ed. by John E. Horrocks (Boston: Houghton Mifflin Company, 1965), p. 11.

It was worthwhile to quote Max Planck at some length, for he exhibits an attitude quite compatible with Peirce's "desire to learn," an attitude which does not limit "by definition the task of science," and which does not disdain to acknowledge an element of "faith" in the scientific "search for truth."

By contrast with Professor Planck, the "behavioral psychologist" B. F. Skinner is not given to philosophical reflection about the nature and aim of scientific inquiry.[10] If anything does distinguish the pronouncements of Professor Skinner and his followers, it is a very discernible "desire to prove the truth," i.e., superior effectiveness, "of a general mode of conceiving things." This desire exhibits itself in a number of verbal forms. At the occasion of a symposium, under the title Behaviorism and

---

[10]Skinner may be called an intellectual opportunist, who uses words without integrity solely to suit his own purposes of the moment. If he finds it convenient, he alternately affirms or denies allegiance to philosophy. For example: He would "make a distinction between behaviorism as a philosophy of science and the science of behavior," suggesting a philosophical, conceptual base separate from the "science of behavior." But when this conceptual base is shown to be seriously inadequate on a number of counts, he replies: "The science of behavior is moving very rapidly and very powerfully and it does not need this kind of philosophical justification. It justifies itself by its success in dealing with the subject matter. . . . There is a science of behavior whether or not there is a useful philosophy of science of behaviorism." T. W. Wann, ed., Behaviorism and Phenomenology: Contrasting Bases for Modern Psychology (Chicago: The University of Chicago Press, 1964), p. 42.

Phenomenology: Contrasting Bases for Modern Psychology. Skinner delivered the following remarks in the beginning of his presentation:

> If psychology is a science of mental life--of the mind, of conscious experience--then it must develop and defend a special methodology, which it has not yet done successfully. If it is, on the other hand, a science of the behavior of organisms, human or otherwise, then it is a part of biology, a natural science for which tested and highly successful methods are available.[11] (italics mine.)

It is permissible to wonder whether Skinner does, by implication, cast doubt on the "scientific" status of investigations carried out by phenomenologist listeners in the audience. He has a long-standing habit of doing precisely this sort of thing to non-users of his methods in general.[12] In this particular case, he assured phenomenologist listeners that: "The basic issue is not the nature of the stuff of which the world is made or whether

---

[11] Wann, Behaviorism and Phenomenology, p. 79.

[12] See H. Feigl and M. Scriven, eds., The Foundations of Science and the Concepts of Psychology and Psychoanalysis (Minneapolis: University of Minnesota Press, 1956), in which Skinner contributed a selection called "Critique of Psychoanalytic Concepts and Theories." This type of critique appears and reappears in most of his major works along with his pet phrases. Essentially Skinner rejects the subject matter traditionally investigated by psychologists, i.e., he repudiates the notion of an "inner man" thought to contribute a psychological dimension to events. Skinner is at pains to discredit as "unscientific" any conceptualization of an "inner man," any attempt to assess the importance of individual states of awareness, and any postulated relation of the "inner man" to the external world of phenomena.

it is made of one stuff or two but rather the dimensions of the things studied by psychology and the methods relevant to them."[13] (italics mine.) However, this assurance was immediately followed by a customary repudiation of the "inner man" and the sentence: "Mentalistic or psychic explanations of human behavior almost certainly originated in primitive animism."[14] After an unflattering review of the "inner man" and the shortcomings of psychic explanations, Skinner concluded:

> An adequate science of behavior must consider events taking place within the skin of the organism, not as physiological mediators of behavior, but as part of behavior itself. It can deal with these events without assuming that they have any special nature or must be known in any special way. The skin is not that important as a boundary. Private and public events have the same kinds of physical dimension [italics mine].[15]

What emerges from the foregoing remarks is a strong concern on the part of Professor Skinner for the utilization now of "tested and highly successful methods." But admittedly, these methods are not suitable for the study

---

[13] Wann, Behaviorism and Phenomenology, p. 79.

[14] Ibid.

[15] Ibid., p. 84; That is to say, Skinner wants to deny the importance of an inner or psychological dimension in the behavior of organisms, he wants to deny to "private events" any causative influence on "public events." As he put it: "It doesn't make any difference to me whether things are conscious or unconscious; the causality in behavior does not depend upon awareness" (italics mine); Richard I. Evans and B. F. Skinner, B. F. Skinner, The Man and His Ideas (A Dialogue) (New York: E. P. Dutton & Co., Inc., 1968), p. 7.

of "conscious experience," the traditional subject matter of psychological inquiry, with which phenomenologists are concerned. Skinner's assurance of what amounts to "metaphysical neutrality" becomes implausible when "tested and highly successful methods" are somehow converted into "relevant methods," "psychic explanations of human behavior" associated with "primitive animism," while "private and public events" acquire by fiat "the same kinds of physical dimension." This latter statement does present what Peirce would call a "general mode of conceiving things," and what could also be labelled a "judgment" by the scientist of a type that Max Planck mentioned. In effect, Skinner gives a definition of behavioral "reality" in terms of one-dimensional events. This definition cuts the Gordian Knot of a second, or psychological, dimension traditionally attributed to behavioral events by defining this dimension away.[16] Quite incidentally, the definition has the further merit of giving a "justification" of sorts to the utilization

---

[16]By cutting out the importance of the inner or psychological dimension in human activities of all types, Skinner can refuse to consider traditional problems of perception, conceptualization, and motivation. Skinner need not consider whether organisms, including man, contribute intrinsic elements to their interactions with environment. All interactions become, ipso facto, extrinsic interactions of bodies moving in space, interactions governed by physical necessity (Deterministic causality).

of "tested and highly successful methods," suited to deal only with one-dimensional events.

At this point it is worth remembering that Max Planck mentioned an "irrational core at the center of science," which he associated with "epistemological judgments and judgments of value" made by the scientist. In effect, from Planck's perspective, Skinner has made a judgment that amounts to a "limiting by definition the task of science," in a vain attempt to abolish this "irrational core." The definition itself embodies epistemological judgments and judgments of value, which affect conceptualization, scientific theory construction, and verification.[17] There can be very little doubt that Max Planck and B. F. Skinner have a somewhat differing outlook on the scientific enterprise. Where the former man is aware that the scientist makes epistemological and value judgments, the latter seems to be misled into

---

[17]Skinner's definition of behavioral "reality" makes of epistemological and ethical inquiry nonsense pursuits, while it makes human judgments an illusion. If his stance were taken seriously, one would have to ask Skinner whether his verbal pronouncements are conscious attempts to reveal the workings of his "inner man" to other people or unconscious motions made in response to extrinsic forces which animate Skinner's behavior. To ask such a question would also be important with regard to language, how words are used by Skinner and for what purpose. One of his followers suggested that Skinner does not use language to communicate (share) ideas but to manipulate (externally control) the behavior of others. See John Platt, "A Revolutionary Manifesto," The Center Magazine, V, No. 2 (March/April, 1972), 42.

considering his definitions devoid of judgment and, hence, tends to mistake them for descriptions of "reality" or "scientific fact." Skinner does not talk about "epistemological judgments," he seems to think:

> . . . a scientific analysis of behavior has yielded a sort of empirical epistemology. . . . The techniques available to such a science (of behavior) give an empirical theory of knowledge certain advantages over theories derived from philosophy and logic.[18]

Since Skinner also appears to believe that "a scientific analysis of behavior" has yielded a "science of values,"[19] one may be tempted to wonder whether an unrecognized "irrational core at the center of science" cannot get out of hand in the claims made by the "scientist."

In terms of Charles Sanders Peirce, scientists of the Max Planck variety remain capable of adopting a "general mode of conceiving things" tentatively; evidently they are prone to remember their basic assumptions,

---

[18] Wann, Behaviorism and Phenomenology, p. 84.

[19] B. F. Skinner, Beyond Freedom and Dignity (New York: Alfred A. Knopf, 1971), p. 104; To put matters somewhat differently, Skinner assumes that the operational definition of human "behavior" as directly observable, extrinsic "response-reinforcer" connection is the only "scientific" definition, and the only worthwhile definition, of human interaction. Given this assumption, "a scientific analysis of behavior" (meaning: the practical manipulation of "responses" and of "reinforcers") yields both, an "empirical epistemology" (meaning: a record of previously manipulated responses) and a "science of values" (meaning: a record of previously "effective reinforcers").

recognize the possibility of error in judgment, and admit to an element "of faith which looks ahead" toward greater understanding. Scientists of the B. F. Skinner variety tend to define one "mode of conceiving things," are apt to forget their basic assumptions, define the possibility of error in judgment into irrelevancy, and often propound the religious dogma of one-dimensional behavioral events with the fervor of medieval theologians.[20] As Charles S. Peirce intimated, acceptance of one "mode of conceiving things" is bound to have interesting consequences on "scientific" investigation and the methods used for inquiry. It may also indicate a "scientist" motivated by something other than a "search for truth" or greater understanding.

---

[20]As the philosopher Norman Malcolm rightly pointed out: "Behaviorism, as a philosophy of psychology, is continuous with the philosophical doctrine of physicalism. . . . " Malcolm himself believes in an "essential difference between man and the lower animals," a difference linked to "the possession of language," "first-person utterances," and a "subject's own testimony" about his own feelings or intentions. Consequently, Malcolm may conclude: "Perhaps the best way to sum up behaviorism's shortcoming as a philosophy of psychology is to say that it regards man as solely an object" [italics mine]; Wann, Behaviorism and Phenomenology, pp. 153-54; But the Skinnerian type scientist is prone to disregard this shortcoming, i.e., to him it is not a shortcoming. He operates from the article of faith that "man is a machine," hence it is a "fact" that man is an object.

CHAPTER IV

THE BEHAVIORIST MODE OF CONCEIVING THINGS

It is probably no accident that Skinner has very little use for any explanation of behavioral events and their relationships to each other, via traditional hypothesis. Behaviorism as a mode of conceiving things calls for a particular outlook on the world, an outlook which denies the importance of "conscious experience" in general and the importance of conceptualization in the sciences in particular.[1] In connection with the education of future behavioral "scientists," Skinner had this to say about the importance of scientific hypotheses and the formulation of experimental design:

---

[1]Skinner provides a clear example of a paradox engendered by one-dimensionality of thought. When the importance of the subjective, psychological dimension in human activities is denied, this dimension moves beyond the ken of critical assessment and evaluation. This makes it possible for Skinner to fervently insist on the acceptance of his own mode of conceiving things, while he fervently denies importance to any alternate mode of conceptualization. Essentially Skinner operates from an irrational faith in the truth of his basic premises, rather than a faith tempered by awareness of human limitations.

> Experimental design is all right for certain very simple manipulations of variables, . . . but is not representative of science in general. Once formulated, such methods must be stretched to fit research to which they aren't adapted, and in the end nothing of interest comes out of it. Give a young psychologist some equipment and a behaving organism, let him explore ways of manipulating behavior, and he won't need formal method.[2] (italics mine.)

Presumably, a hypothesis would present a conceptualization of possible structures or arrangements of events, i.e., it would present possible relationships between organisms and their environment. As such, a hypothesis would call for the development of an experimental design to "test" conceptualized relationships against a "reality" independent of the scientist's individual, conceptualizing

---

[2]Evans and Skinner, B. F. Skinner, The Man and His Ideas, pp. 88-89; This particular pronouncement was made in 1968, but in 1950 Skinner already questioned the value of traditional theories of learning for "scientific" investigation. He evidently believed it " . . . possible that the most rapid progress toward an understanding of learning may be made by research that is not designed to test theories." What was to guide, or give direction, to scientific investigation was made plain when Skinner offered his own version of a "theory" immediately following: "This does not exclude the possibility of theory in another sense. Beyond the collection of uniform relationships lies the need for a formal representation of the data reduced to a minimal number of terms. A theoretical construction may yield greater generality than any assemblage of facts. But such a construction will not refer to another dimensional system. . . . It will not stand in the way of our search for functional relations because it will arise only after relevant variables have been found and studied" (italics mine.); B. F. Skinner, "Are Theories of Learning Necessary?" The Psychological Review: American Psychological Association, Inc., LVII (July, 1950), 215-16.

self.[3] Unless, of course, the "scientist" has no important "conscious experience" or conceptualizing ability, but is the chosen tool of a higher consciousness at work in the universe. In the latter case, the "scientist" could dispense with the criteria set up by ordinary mortals, bent on evaluating their activities in various ways.[4] As the chosen tool of a higher consciousness, he would clearly be beyond human criticism and his activities beyond human evaluation.

To those who have minimal needs to see supernatural manifestations in the activities of scientists, Skinner's pronouncements suggest a type of "scientific inquiry" pioneered by the alchemists of an earlier

---

[3]Traditional scientific investigation was intended to be a two-dimensional activity; it was an attempt to test the subjective, psychological dimension of conceptualized uniformities, expressed in a hypothesis, against the objective, empirical dimension of independently ordered phenomena in the external world. One might say that the testing of one dimension against the other was assumed to bring into balance or harmony two aspects of "reality," the reality of human belief with the reality of an independent world, producing reasonable belief rather than irrational faith.

[4]Instead of operating from a hypothesis, which would delineate the variables to be observed and postulate the uniformities to be tested before investigation is undertaken, the Skinnerian "scientist" seems to be guided by his selective perception in the discovery of "relevant" variables and by his conceptualization of "uniform relationships" in the "collection" of such relationships. He merely puts down his findings after he has found them, and uses them to generalize. This suggests infallibility in the perception of "relevant variables" as well as infallibility in the conceptualization of "uniform relations" on the part of the "scientist."

historical era. He does not recommend a search for theoretical explanations[5] of behavioral events; he recommends practical control over the organism and its environment in order to produce a "desired" combination.[6] Where the alchemists specialized on manipulating minerals or inferior metals in their attempts to find the recipe for a desired combination of ingredients called "gold," Skinner specializes on manipulating organisms and environments in a similar attempt to find recipes for a desired combination of ingredients called a "functional relation." In defense of alchemists, it should perhaps be mentioned that their objective was relatively limited

---

[5]Traditional theoretical explanations of behavioral events presumably consist of extensively tested hypotheses, systematized under some theoretical construct, for which no major disconfirming evidence has been produced to date, and which have become established theories. Theoretical explanations may be said to be open-ended insofar as they do not preclude the introduction of new hypotheses or evidence, even though such hypotheses or evidence might call for the revision or curtailment of already established theories. Skinner's notion of a "theory" and "theoretical explanations" is drastically different. He has no use for hypotheses, but operates from an unacknowledged and hence incorrigible conceptual base. His "theoretical constructions" are in principle unaffected and unaffectable by contrary evidence because such evidence will not be considered "relevant variables." See Skinner's remark that "spontaneity is negative evidence" in B. F. Skinner, Science and Human Behavior (New York: Collier-Macmillan Limited, 1953), p. 48.

[6]For the Skinnerian scientist, the kind of combination between organism and environment which he desires to bring about becomes, ipso facto, a universally "desirable" combination. One-dimensionality of thought obfuscates a distinction between the subjective, individually desired goal and the inter-subjective, humanly desirable goal, precisely by insisting on the unimportance of the psychological dimension in human activities.

and ordinary eye-sight sufficient to decide whether or not the commodity "gold" had been cooked up. Skinnerian objectives are less concrete and something more than ordinary eye-sight seems to be required to decide whether or not a "functional relation" between organism and environment has been produced. The Skinnerian "scientist's" eye-sight is supplemented by an "analytical unit," which replaces the traditional scientific hypothesis as the conceptual base for "scientific" activities. To the student of his works, Skinner's aversion for theory construction and his preference for "analytical units" have played a consistent part in his endeavors, albeit on a more modest scale to start with. In his first major publication, The Behavior of Organisms, issued in 1938, the "analytical units" started out with "some sort of reflex" relation between environmental forces and behavioral responses of organisms.[7] At least in Skinner's mind, a "reflex" constituted both an "analytical unit" which made "an investigation of behavior possible" and a "fact."[8] In the decades since 1938, Skinner has elaborated and enlarged his original conceptualization under the label of "functional relation"

---

[7]B. F. Skinner, The Behavior of Organisms: An Experimental Analysis (New York: Appleton-Century-Crofts, Inc., 1938), pp. 8-10.

[8]Ibid., p. 9.

between organism and environment.[9] The ingredients of a "functional relation" are referred to as "variables of behavior" and are characterized as directly observable simple events. "Variables of behavior" are postulated to emanate from either an organism or the environment but are defined in terms of each other.[10] If a variable emanates from an organism, it may be called "response," "class of responses," or "operant"; if a variable emanates from the environment, it may be called "stimulus" or "reinforcer." The manner of combination of these directly observable "variables of behavior" is postulated to be that of either "stimulus-response" or "response-reinforcer," a directly observable complex event. As the label "functional relation" suggests, the combination stimulus-response or response-reinforcer is attributed "survival value" for the organism in a given environment.

---

[9]Since stimulus-response and response-reinforcer combinations between select responses of organisms and limited environments have been brought about in the laboratory, Skinner's notion of a "theory" allows him to generalize to all responses from all organisms in all environments. It also allows him to generalize from selectively demonstrated external control relations to universal external control.

[10]By defining directly observable, simple events in terms of each other, Skinner elevates a hypothetical relation to a "fact" by definition. From a metaphysical perspective, the hypothetical relation or "relational fact" by definition attains greater "reality" than the separately observable, simple event or "empirical fact" by perception.

By 1953, in his book entitled Science and Human Behavior, Skinner had worked out some sort of historical progress report on his "analytical unit," in which the philosopher Descartes and the physiologist Pavlov were credited with certain seminal ideas for his own more advanced "scientific" conceptualizations.[11] At this time, Skinner was able to distinguish various levels of "functional relation" between organisms and their environment in terms of the "range of control" exerted by environmental forces. Apparently at the lowest level he conceptualized a "simple reflex," or stimulus-response relation, in which environmental stimuli control the physiological responses of organisms. At what seems to be the next higher level of "functional relation," he discussed "conditioned reflexes" along with a "process of conditioning," the latter controlling the modification of an organism's established responses through stimulus

---

[11]Skinner is interested only in Descartes' ideas on mechanistically caused behavior, not the behavior attributed and connected with a rational soul. In tracing the origin of the idea of "reflex action," Skinner, Science and Human Behavior, p. 47, credited Descartes with " . . . an important step in suggesting that some of the spontaneity of living creatures was only apparent and that behavior could sometimes be traced to action from without. The first clear-cut evidence that he had correctly surmised the possibility of external control [italics mine] came two centuries later . . . " in the studies of "reflex." See also Skinner, Beyond Freedom and Dignity, p. 17. According to Skinner, Science and Human Behavior, p. 50, "The reflex became a more important instrument of analysis when it was shown that novel relations between stimuli and responses could be established during the lifetime of the individual by a process first studied by . . . I. P. Pavlov."

change and/or substitution.[12] Last but not least, Skinner mentions "operant behavior," i.e., a response-reinforcer relation, along with a process of "operant conditioning," in which an organism's responses are brought under the control of reinforcers.[13] Presumably Skinner's conceptual edifice is both an "analytical unit" which makes "an investigation of behavior possible" and an empirical "fact." As an "analytical unit," the conceptual edifice

---

[12]Apparently Skinner's notion of a "theoretical construction" permits something like the following "scientific generalizations": (1) Some external stimulus-response relations between environment and organism are an established "fact" (a traditional theory), hence it may be assumed proven that the environment controls the responses of organisms. (2) In conditioning experiments, selected responses of organisms have been changed (were changeable) when stimuli from the environment were changed, hence it may be assumed proven that the environment controls changes in the responses of organisms through a process of conditioning. In Skinner's dazzling verbal behavior, Science and Human Behavior, p. 55, the "process of conditioning" acquires "survival value": "Since the environment changes from generation to generation, . . . appropriate reflex responses cannot always develop as inherited mechanisms. . . . the evolutionary process can only provide a mechanism by which the individual will acquire responses to particular features of a given environment after they have been encountered. Where inherited behavior leaves off, the inherited modifiability of the process of conditioning takes over."

[13]Skinner's "scientific investigations" and/or "analyses of behavior" are limited a priori to the confines of response-conditioning, in which " . . . two cases exhaust the possibilities: an organism is conditioned when a reinforcer (1) accompanies another stimulus (classical Pavlovian conditioning) or (2) follows upon the organism's own behavior (operant Skinnerian conditioning). Any event which does neither has no effect in changing a probability of response" [italics mine]; Skinner, Science and Human Behavior, p. 65.

provides the incorrigible theoretical foundation of the "science of behavior"; as a "fact," the conceptual edifice seems to be the result of a somewhat dubious process of "scientific generalization," designed to justify any environmental control over responses of organisms. One might put matters somewhat differently by saying that Skinner's "analytical unit" presupposes a particular causal relation between organisms and their environment which is, at one and the same time, both "deterministic" and "teleological." The stipulated causal relation is "deterministic" in ascribing control over the responses of organisms to the external environment; it is "teleological" in recognizing only environmental-control/responding organism combinations as "functional relations" with "survival value."[14] The uncritical acceptance of a

---

[14]Skinner's one-dimensionality of thought hopelessly obfuscates a traditionally made, useful distinction between a deterministic causality in the physical dimension and a teleological causation in the psychological dimension of phenomena. As a latter day social Darwinist, he delivers himself in his own inestimable style: "Very often we attribute purpose to behavior as another way of describing its biological adaptibility. . . . In both operant conditioning and the evolutionary selection of behavioral characteristics, consequences alter future probabilities. Reflexes and other innate patterns evolve because they increase the chances of survival of the species. Operants grow strong because they are followed by important consequences in the life of the individual. (italics mine.) Both processes raise the question of purpose for the same reason, and in both the appeal to a final cause may be rejected in the same way," Science and Human Behavior, p. 90. It doesn't bother Skinner in the least that he seems to have made a jump from "natural selection" to the "scientist's selection," from "evolutionary purpose" to the "scientist's purpose," which are apparently one and the same.

deterministic-teleological causality at work in the interaction between organisms and their environment appears to be inherent in the acceptance of Skinner's "analytical unit" on whatever level of "investigation." Unlike a scientific theory of the old-fashioned variety, which was, at least to some degree, subject to criticism and revision, Skinner's "analytical unit" prescribes a particular "mode of conceiving things" as essential for a "scientific analysis of behavior." By implication Skinner usually suggests that nothing other than this particular "mode of conceiving things" is "scientific."

The acceptance of Skinner's "analytical unit" for the "scientific analysis of behavior" puts the "scientist" in possession of a portable Skinner-box of the mind. The mental box obviates the need to ask further theoretical questions, whether these questions have to do with definitions of events to be investigated or with conceptualizations of relationships among such events. The mental Skinner-box in effect confines scientific investigation of possible "lawful relations" to one and only stipulated "functional relation" between organism and environment, while it confines observation of possible "variables" to "stimulus, reinforcer, response" events. When applied to a given practical situation, the mental Skinner-box frames this situation accordingly in terms of a metaphysically "real," or at

least empirically unquestionable, stimulus-response or response-reinforcer interaction between organism and environment. Put somewhat differently, Skinner's "analytical unit" for the "scientific analysis of behavior" denies either the existence or the relevance of any response by an organism which is unattached or uncontrolled by an environmental stimulus/reinforcer.

In the behaviorist "mode of conceiving things" as a base for selective perception, "behavior" is always the result of a stimulating/reinforcing environment; really "real" behavior is an established "functional relation" between organism and environment. Hence the practicing "scientist" may feel fully justified in using a method of conditioning to establish and maintain responses linked to reinforcers, since such linkages have "survival value." Moreover, the practicing "scientist" may also feel fully justified in changing "responses" or a "class of responses" by changing the "contingencies of reinforcement" in the environment, since such changes also have "survival value." Given the conceptual base for the "science of behavior," the practicing "scientist" cannot go wrong in his activities as long as he brings the responses of organisms, whether human or otherwise, under the control of the environment.

Perhaps it is superfluous to point out that the behaviorist "mode of conceiving things" embodies a

number of rather pronounced "epistemological judgments and judgments of value," as Max Planck put it. On the theoretical-epistemological level of human endeavors, the behaviorist "mode of conceiving things" outlines a picture of the "reality" which is to be investigated by the "scientist" and prescribes what perceptual data are to be selected as "relevant." On the practical-moral level of human endeavors, the behaviorist "mode of conceiving things" justifies the establishment of environmental control over the responses of organisms by the "scientist" and prescribes how organisms and environments should be manipulated to achieve "desired" results. For the behavior-alchemist, "the life of science" is in the practical manipulation of external "variables" in order to cook up more and more environmentally controlled "functional relations."

CHAPTER V

THE BEHAVIORIST DESIRE TO PROVE THE TRUTH OF A DEFINITE OPINION

Skinner has become famous through his ceaseless efforts to rid the world of the presumably dysfunctional "myth" of "inner man" and through his attempts to convert other people to a behavioral "mode of conceiving things." He seems to be convinced that the manner of interaction between man and his natural-social environment has either been traditionally misconstrued or explained in unnecessarily complicated terms. It is quite self-evident to Skinner that a postulated individual "self" is a hypothetical "fictitious entity" without explanatory value for the "behavior" of human organisms.[1] If people believe that they have feelings,

---

[1]Since Skinner's one-dimensional definition of "behavior" as external response linked to external stimulus/reinforcer rules out the importance of the inner dimension of man, it is tautologically true that any postulated inner "self" is a "fictitious entity" without explanatory value in Skinner's scheme of things. But it is equally true that "human behavior" can be defined differently, indeed, it has been defined differently in the history of Western thought. Apparently

needs, and wants which may be recognized and become subject to conscious reflection, or which may bring about individual judgments concerning "appropriate" action and "satisfactory" changes of action, they are apparently mistaken. Self-awareness does not contribute possible causal elements to the "behavior" of human organisms, as far as Skinner is concerned. When challenged on this particular article of faith, he usually produces a reply of the following type:

> I am not convinced that the things Dr. Rogers sees and infers (Carl Rogers infers a "self" and sees an individual's perception of himself as the nodal point of relationships with his environment) are the primary moving forces. They seem to be epiphenomenal in a philosophical sense or, at least, something which occurs after the important fact.[2]

Such a reply is, of course, not at all surprising in light of the advocated "mode of conceiving things" and pronouncements to the effect that:

> . . . the organism is irrelevant either as the site of physiological processes or as the locus of mentalistic activities. . . . As a determinist I must assume that the organism is simply mediating the relationships between the forces acting upon it and its own output, and these are the kinds of relationships I'm anxious to formulate.[3]

Skinner never feels a need to ask himself whether, from another perspective, a postulated external stimulus-response relation between environment and organism constitutes a "fictitious relation."

[2]Wann, Behaviorism and Phenomenology, p. 135.

[3]Evans and Skinner, B. F. Skinner, The Man and His Ideas (A Dialogue), pp. 22-23.

Skinner is simply not interested in the subject matter of traditional psychological inquiry. That is to say, he is simply not interested in individual human beings as a source of "conscious experience" and emotional or cognitive events.[4] These latter events are, from Skinner's physical-deterministic perspective, "epiphenomena" or unimportant by-products of "real behavior" which have neither causative nor purposive relevance in the "lawful" interactions between organisms and their environment.[5]

Put somewhat more bluntly, Skinner insists on his own conceptualization of the causal interaction of forces between controlling environment and responding organism, as well as his own definition(s) of "behavior." As was pointed out previously, his "analytical unit" for the "scientific analysis of behavior" constitutes the essential theoretical base and starting point for all truly "scientific" endeavors. If a "young psychologist" has the proper frame of mind, plus "some equipment and a

---

[4]Given the perspective of Erich Fromm, Skinner provides a fine example of a human being with an "intense need for certainty," a need so intense that he is willing to deny human autonomy and freedom in order to escape from "the painful tension of doubt." To all appearances, Skinner simply "wants to believe [italics mine] that there is no need to doubt that the method by which he makes his decisions (about human behavior) is right," and that his method is the only "scientific" (meaning authoritative) one.

[5]Skinner would seem to be a "psychologist" in name only, he obviously repudiates the importance of a psychological dimension in human behavior. It would probably be less misleading to call him a "biophysicist."

behaving organism," he can set up an environment which allows him to watch the "behavior" of the organism as it occurs. In other words, he can watch the organism's "force output," the organism's "behavior" defined " . . . as the movement of an organism in space [italics mine] with respect to itself or any other useful frame of reference."[6] Few people would probably feel inclined to deny that "behavior" in this sense is a directly observable, empirical "fact." By common consensus, embedded in the use of language, living organisms do move about. For example, even the most primitive organisms move from one place to another, while the more complex ones may sit up, lay down, turn around, etc.; in short, organisms tend to engage in activities which are observable as movement in space by any person with a common-sense perceptual framework and without visual handicap. But, according to Skinner, the "psychologist" in training does not passively watch the "behavior" of organisms, he apparently actively "explores ways of manipulating behavior."[7]

Given the assumption that every movement of an organism in space is the response to either a stimulating

---

[6]Evans and Skinner, B. F. Skinner, The Man and His Ideas (A Dialogue), p. 8.

[7]That is to say, the Skinnerian "scientist" tries to find out what means under his control will, for example, induce an animal to sit up when he wants it to go through this motion.

or reinforcing movement by an environment,[8] a "psychologist" may embark on an "empirical analysis" to "isolate" this environmental moving force. That is to say, "behavior" is not really just an organism's movement in space; it is a movement in space which occurs as a "response" to an environmental moving force. "Behavior" in this sense is defined as "response-reinforcer" interaction and is, according to Skinner, both an "analytical unit" and a directly observable, empirical "fact." But somehow "behavior," in the sense of a response-reinforcer interaction, does not seem to be quite as directly observable an empirical "fact" as "behavior" in the sense of "movement in space." It would appear to be precipitate to stigmatize those who do not directly observe this "response-reinforcer" interaction of forces as striken by visual handicaps which make them unsuitable for a career in "science." Such people may merely hesitate to don the metaphysical glasses of Skinner's "analytical unit" and, accordingly, refrain from manipulating

---

[8]Skinner's use of words is generally confusing, but particularly in the case of the words "stimulus," "reinforcer," and "response." He frequently talks about a "reinforcing stimulus," evidently the word "reinforcer" refers interchangeably to a prior cause (stimulus) of a response and a subsequent reward (reinforcement) for a response. His use of the word "response" is hardly less confusing, since it covers both a response and a goal-directed act. The confusion is likely to befall only non-Skinnerians, who have trouble accepting the merger of necessity and purpose, of deterministic and teleological causality. The intelligent use of ordinary language calls for many distinctions which Skinner would abolish.

"behavior" in order to establish certain response-reinforcer connections dictated by a deterministic-teleological causality.

Skinner's "desire to prove the truth of a definite opinion," i.e., the opinion that a deterministic-teleological causality should be supported by the scientist in governing all interactions between organism and environment, issues in an astonishing disregard for conventions of language, not to mention a disregard for rules of reasoning. Perhaps it is too much to expect from someone who disowns the importance of "conscious experience" to abide by rules developed to govern it. Be that as it may, behavioral events are evidently defined ambiguously by Skinner as simple(r) movement-in-space event, emanating from an organism, and as complex response-reinforcer interaction event between organism and environment. This dubious definition procedure allows Skinner to switch back and forth from "behavior" as a directly observable empirical "fact" to "behavior" as a conditionally demonstrable empirical "fact."[9] Given control over an organism and its environment, the

---

[9]Skinner is not in the verbal habit of maintaining a distinction between the "behavior" of an organism in the sense of a "behavioral response" (observable motion) and the "behavior" of an organism in the sense of a "response-to-reinforcer" (conditioned response). For Skinner, "behavior" in both senses is a "fact." One can only remind oneself that "behavior" in the second sense is a conditionally demonstrable relation.

"scientist" can demonstrate a "response-reinforcer" interaction which is, ipso facto, a "functional relation" and empirical "fact." Along with Skinner's two-level definition of "behavior," empirical "facts" seem to divide on parallel lines into simple "facts" by observation and complex "facts" by manipulation. While the former "facts" occur prior to any intervention by the "scientist," the latter "facts" follow in the wake of "scientific" activity which is contingent on the "scientist's" control over the organism and/or its environment.[10] Both types of "fact" are, of course, impartially recognized by Skinner in support of his opinion and enjoy equal status as "evidence."

There is a basic ambiguity and circularity in Skinner's pronouncements, which makes it difficult for the reader or listener to decide whether he is confronted by the verbal manifestations of a "conscious" reasoning procedure by a "self" or with the "operant verbal behavior" of an organism responding to environmental "reinforcers" and/or "intermittent reinforcement

---

[10]There is good reason to believe that a conditioned response, i.e., a conditionally demonstrable stimulus/reinforcer-response relation, would not come about without the active intervention of a manipulating scientist. Neither dogs salivating to the sound of a bell, nor table-tennis playing pigeons seem to occur much outside of laboratories. Whatever "behavioral uniformities" are reported as a result of conditioning experiments may be more of a tribute to the scientist's ability to impose his will or order than to his ability to reproduce an orderliness inherent in nature.

procedures" of an unspecified kind. In "verbal behavior," as distinguished from conventional use of language by a "self," words acquire a new, Alice-in-Wonderland quality. Skinner's ambiguous definition(s) of "behavior" and his peculiar notion about "facts" seem to make his "science of behavior" a somewhat unique endeavor in "analysis," with its own interpretation of "testing" and the utilization of "empirical evidence." In traditional terms, Skinner's "functional relation" between organism and environment is a conceptualized or inferred relation between separably observable movement-in-space events. Due to the analytical nature of the "science of behavior," no inquiry can get started without the "analytical unit" which postulates this relation. Skinner's verbal behavior seems to point to a paradox of some kind: " . . . order is not only a possible end product; it is a working assumption which must be adopted at the very start."[11] (italics mine.) The question is, how strongly

[11]Skinner, Science and Human Behavior, p. 6; That is to say, a response-reinforcer order (conditioned response) is the end product of a working assumption that responses of organisms are (should be) controlled by environmental reinforcers. In discussing "The Value Presuppositions of Science," the philosopher E. A. Burtt called attention to the values implicit in different notions of cause and effect. Skinner's endeavors provide an excellent illustration for Burtt's contention that modern scientists are preoccupied with the value of prediction and control, which become the sole guide in the choice of a possible causal order. Burtt finds this development particularly distressing in the behavioral sciences; Paul C. Obler and Herman A. Estrin, eds., The New Scientist: Essays on the Methods and Values of Modern Science (Garden City, N.Y.: Doubleday & Company, Inc., 1962), pp. 258-79.

must this working assumption be adopted at the very start of inquiry and how can the assumption be "tested" through the utilization of "empirical evidence"?

The beauty of an "analytical unit," as distinguished from a conventional scientific theory, is that it adopts a working assumption quite firmly, namely, a response-reinforcer "functional relation" between organism and environment. Whatever references are made by the "analytical unit" to "movement-in-space" events are limited by definition to "responses" and "reinforcers." That is to say, the "scientist's" observations are confined to such separably observable "movement-in-space" events as stand in the relation of "response-reinforcer" to each other. While the "movement-in-space" events may be directly observable "facts," the "response-reinforcer" relation is not directly observable until and unless the quality of a "response" and the quality of a "reinforcer" has been "isolated" as such through the manipulations of the "scientist." Once this task has been accomplished, "functional relations" can be "explained." According to Skinner: "An <u>explanation is</u> the <u>demonstration of a functional relationship</u> between behavior and manipulable or controllable variables."[12] (italics mine.) And, one might add, the accomplished demonstration of a "functional relation" is a "fact."

---

[12]Wann, <u>Behaviorism and Phenomenology</u>, p. 102.

For Skinner, a "functional relation" becomes a directly observable "fact" through demonstration and, one is tempted to say, through the judicious use of selective perception. If the "scientist" cannot "isolate" any "responses" and particularly "reinforcers," then the events he is analyzing simply do not have the proper qualities and may be eliminated from further "observation." If the "scientist" can "isolate" "responses" and "reinforcers," then he can manipulate these "variables of behavior" and "demonstrate" a "functional relation" between them. Traditionalists, given to an old-fashioned use of language, would probably say that the "scientist" can only "demonstrate" that his control over "reinforcers" or consequences allows him to influence the organism's "responses" or activities. What kind of a relation between organism and environment this procedure demonstrates is open to question. A neutral observer does not have to "see" a "functional relation," he could just as well "see" someone's coercive or manipulative intervention in the flow of events, depending on the kind of "reinforcer" used. If the "reinforcer" used is essential for the health or physical survival of the organism, such as food or water, then the intervention might be seen as "coercive." If the "reinforcer" used is not essential for the health or physical survival of the organism, such as a verbal noise, then the intervention

might be seen as on the manipulative side. In order to "observe" the "demonstration" of a "functional relation" between organism and environment, an observer must first accept the definition of "behavior" as response-reinforcer interaction, stipulated by the "analytical unit." In traditional terms, a "functional relation" is a hypothetical, inferred relation between organism and environment. As such, a "functional relation" is an explanation which may or may not be acceptable, depending on the evidence for and against it. In other words, what Skinner claims is being "demonstrated" is not subject to direct observation at all. To equate an "explanation" with a "demonstration" is to make a mockery of scientific testing procedures.[13] Evidently the "science of behavior" rests ambiguously on the foundation of first-level "facts," or "movement-in-space" events limited by definition to "response" and "reinforcer" events, as well as second-level "facts," or response-reinforcer "functional relation" events. Second-level "facts" are true

---

[13]According to the philosopher Arnold S. Kaufman, "The Aims of Scientific Activity," The Monist, LII, No. 3 (July, 1968), 381, "From the Aristotelean point of view, Skinner's preoccupation with the shaping of behavior, and more generally with the development of predictive power in the service of control, is irrelevant to the truly scientific [italics mine] enterprise. That is, it is not that Skinner is a bad scientist or an ineffective scientist--he is not truly scientific at all." Needless to add that Charles S. Peirce's notions of the scientific enterprise run along Aristotelean lines. To him Skinner would be a "practical man," not a "scientist."

by definition and are not falsifiable within the context of behaviorist "demonstration" procedures.

Whatever "data" is collected by the behaviorist has nothing to do with traditional testing of a conceptualized, inferred relation called "behavior." Rather, the "data" have to do with what "variables of behavior" have been "isolated" or established to be "controllable" by the "scientist." Whatever relationships or structure of events is "explained" by the behaviorist, amounts to a record of how these "variables" have actually been controlled by the "scientist" in the past. Skinner's second-level "fact" has usurped the place of the traditional scientific theory but is, unlike the traditional scientific theory, no longer subject to empirical checks and revisions. Second-level "facts" do, indeed, become "facts" by definition and a leap of faith on the part of the "scientists." The talk about what passes for the collection of "data" and "scientific demonstration" seems to serve the merely practical function of converting other people, through prodigious outputs of "verbal behavior," to the opinion that a deterministic-teleological cosmic order is at work in shaping the phenomena of behavior.

It is not surprising that Skinner can put such unlimited faith in the "facts," which presumably speak for themselves. However, there are excellent reasons for other people to believe that the "facts" speak for

themselves only in a metaphorical sense, obfuscated by the devout behaviorist. A "science" proceeding from so-called "facts" cannot be disentangled from "the esthetic judgments and the judgments of value" made by the scientist, as Max Planck realized, any more than a science proceeding from theories and inferred "self" reference points.[14] The intelligent reader may feel he owes a debt of gratitude to the conventionally oriented scientist, who lables his theories or inferences for what they are and eliminates the Alice-in-Wonderland games which convert an "explanation" into a "demonstration," an "inferred relation" into a "fact," and the behaviorist "scientist's purpose" into a universal cosmic "causal necessity." By comparison with the old-fashioned approach to science, the "analytical science" of "behavior" appears to be a giant enterprise in rationalization, propelled solely by an overwhelming desire to defend the truth of a definite, preconceived opinion.

---

[14]As Kaufman pointed out, "The Aims of Scientific Activity," p. 38, these two approaches to science seem to reflect a profound ideological difference. " . . . once the issue is joined at this level of basic conviction the conflict becomes profoundly ideological. It cannot be dealt with in any rational way except by making explicit the normative convictions that underly the incompatible conceptions of the nature of psychology or, more generally, of science, and arguing for those respective positions as well as one can. Nor is the conflict merely theoretical; it is normally profoundly political. For behind the abstract arguments ordinarily lie very different beliefs about the priorities that ought to guide the allocation of social resources available . . . " (italics mine.)

CHAPTER VI

THE METHOD OF CONDITIONING AND THE TECHNOLOGY OF CONTROL

Skinner is obviously disinterested in the investigation of human "conscious experience" and, hence, equally unconcerned with any exploration of an "irrational core at the center of science," as Max Planck put it. An irrational core which can be minimized or maximized by the personal idiosyncrasies and judgments of the "scientist." Skinner's idiosyncrasies and judgments should be a source of concern. His "scientific" findings with select animal organisms have led him to utilize second-level "facts," i.e., a number of established "functional relations" between animal response and environmental reinforcer, as "data" for the generalization to third-level "facts," i.e., he now "sees" response-reinforcer "functional relations" between individual human beings and their social environment, or even fourth-level "facts," i.e., he "sees" response-reinforcer "functional relations" between man as a species and his total natural environment. Ordinary mortals may be forgiven when their

vision disintegrates into a case of intellectual vertigo on the way up these breathtaking heights of "analytical units." There remains Skinner's "verbal behavior" as a reassuring background noise to combat the dizzy-spells and to facilitate the blind movement toward new vistas:

> The role of natural selection in evolution was formulated only a little more than a hundred years ago, and we are only beginning to recognize and study the selective role of the environment in shaping and maintaining the behavior of the individual. As the interaction between organism and environment has come to be understood, however, functions once assigned to states of mind, feelings and traits are beginning to be traced to accessible conditions. . . . A scientific analysis shifts both the responsibility and the achievement (of individuals) to the environment.[1]

For Skinner, any "irrational core at the center of science" is irrelevant until it manifests itself in the physical environment at large. And then it is simply a "fact." As early as the publication of "Science and Human Behavior" in 1953, he has had visions of widening response-reinforcer "functional relations" between human organisms and their environment with the help of "operant conditioning," thereby facilitating the evolutionary development of "behavior" in order to benefit mankind. Apparently an unrecognized "irrational core at the center of science" tends to be maximized to the point of caricature.

---

[1]Skinner, Beyond Freedom and Dignity, p. 25.

Skinner's personal idiosyncrasies would not necessarily be a matter for great concern, if "scientific success" had not led him to some rather exorbitant generalizations from highly selective and/or non-falsifiable "data."[2] His initial success with animal organisms has led him to generalize to the point of advocating large-scale "operant conditioning" through the application of "reinforcement" techniques. The justification for his advocation of what amounts to a major social, or even general cultural, reform must have its source either in a psychological certitude, unwarranted by the findings of the "science of behavior" and its activities to date, or in an ethical delusion about the infallibility of the "scientist's" judgment and/or action in behalf of a superhuman environmental moving force. Whatever the case may be, Skinner's Alice-in-Wonderland logic, which makes "facts" out of "theories," also makes a political

---

[2]Chris Argyris, Review of B. F. Skinner's Beyond Freedom and Dignity, Harvard Educational Review, XLI, No. 4 (November, 1971), 553, wrote one of the better reviews on Skinner's latest book. Argyris, a social psychologist, made the following, much to the point, comments about scientific generalizations and/or value judgments: "Skinner plants his feet firmly on the ground of experimental science, promising all of us that such ground will not buckle under use and confrontation. . . . Few would disagree that valid evidence . . . is a strong basis for action." Argyris doubts "whether the experimental model necessarily provides data for designing our life" and suggests two major problems in the use of rigorous methodology: "(1) the danger of producing invalid information without realizing it, and (2) the danger that a world designed to model the properties of experimental science can only provide clues . . . how to maintain . . . the status quo."

"direct-action" program out of the "investigations," via "demonstration" of the "scientist." For the Skinnerian behaviorist, the use of "scientific method" in the investigation of behavioral phenomena is synonymous with the use of "operant conditioning" techniques for the demonstration of the "facts" of "behavior" as "functional relation." The "scientific methods" that Skinner so frequently refers to in his writings are techniques for the conditioning of the "responses" of organisms, whether human or otherwise, into "functional relations" with the environment.

Euphemisms aside, Skinner maintains that all movement-in-space "responses" by organisms are controlled by, i.e., they are "responses" to, either a "stimulus" or a "reinforcer" from the environment. Given this assumption, the first step in Skinnerian "scientific" endeavors must needs be an "empirical" or "scientific analysis" of the "functional relation" between "response" variables and "stimulus/reinforcer" variables of which "behavior is a function." In traditional terms, such an "analysis" is presumed to yield an adequate, empirical description of "behavior" by Skinner, who is not in the habit of making distinctions between the "rationally limited" and the "empirically possible," between restrictive "definition" and exhaustive "description." Actually, Skinner has not been much interested in the study of "elicited behavior," i.e., behavioral "responses" of

organisms which are under the control of a prior "stimulus" from the environment. His primary attention has been consistently focused on "operant behavior," i.e., behavioral "responses" of organisms which change under the control of a subsequent "reinforcer." In an "empirical analysis" of what Skinner calls "operant behavior," the "scientist" determines by a "direct test" whether certain environmental events have a "reinforcing effect" on select behavioral "responses" of the organism. About such an "isolation" of a "reinforcer" variable, Skinner has this to say:

> . . . the only defining characteristic of a reinforcing stimulus is that it reinforces. The only way to tell whether or not a given event is reinforcing to a given organism under given conditions is to make a direct test. We observe the frequency of a selected response, then make an event contingent upon it and observe any change in frequency. If there is a change, we classify the event as reinforcing to the organism under the existing conditions.[3] (italics mine.)

Apparently Skinner does not find anything "circular" in his definition/description of a "reinforcer" variable as "reinforcing" event. Obviously, what the "scientist" needs for his "empirical analysis" is a "behaving organism" and practical control over the occurrence of environmental events. This amounts to saying that the "scientist's" control over consequences for the "responses" of the organism allows him to single out those that are

---

[3]Skinner, Science and Human Behavior, pp. 72-73.

important consequences for the organism. Once the "scientist" has "isolated" the "reinforcing effect" of a particular environmental event, he can then proceed to the next step in the "scientific" endeavor.

The next step in the Skinnerian "scientific" endeavor is called "operant conditioning" and constitutes the behaviorist "scientific method" for the "prediction and control of behavior." As might be expected, in Skinner's terminology the words "prediction" and "control" are used interchangeably. To start out "operant conditioning" procedures, the "scientist" selects a particular behavioral "response" of the organism to be linked with an already "isolated" environmental "reinforcer" in a dynamic "functional relation." Given a behaving pigeon and a food "reinforcer," for example:

> We select a relatively simple bit of behavior which may be freely and rapidly repeated, and which is easily observed and recorded. . . . The behavior of raising the head beyond a given height is convenient.[4]

Whenever the pigeon raises its head beyond a given height, the "scientist" in the environment provides a food "reinforcer." If the demonstration is conducted properly,

---

[4] Ibid., p. 63; Skinner's "select bit of behavior" does occur without scientific intervention but seems to change as indicated only after scientific intervention and the imposition of the scientist's purpose. If the "select bit of behavior" originally was the result of a deterministic relation with environment, this relation has been purposively altered by the scientist, i.e., the control of an impersonal environment has been replaced by the control of the person called "scientist."

"In a minute or two, the bird's posture has changed so that the top of the head seldom falls below the line which we first chose."[5] That is to say, the next step in the "operant conditioning" procedure has been successfully completed. The selected behavioral "response" of the pigeon has been "shaped" or changed to the specification/prediction by the "scientist." The "shaping of responses" incidentally "demonstrates" a "functional relation" between organism and environment which is kept dynamic through a process of conditioning.

Skinner's original claim to "scientific" fame rested on a "methodological" discovery in the area of "operant conditioning" and, more specifically, in the area of "reinforcement techniques." Skinner discovered that the already "shaped response" will be emitted longer and more persistently by a pigeon, if this response is only "intermittently reinforced." To put the matter somewhat differently, a pigeon conditioned to give a particular "response" or "class of responses" seems most likely to continue the "response(s)" longer, if they are not "reinforced" at every occurrence, but only at specified intervals of varying length. By devising proper "schedules of reinforcement," the "scientist" may insure the most efficient use of "reinforcers" by getting a maximum return of "responses" for a minimum expenditure

---

[5] Ibid., p. 64.

of "reinforcers." In ordinary language, if a pigeon is kept from satiation and remains slightly hungry, its activities are easier to control since it will probably make more persistent exertions to obtain food.

This third step in "operant conditioning" is referred to as "maintaining behavior," and is accomplished through the "scientist's" control over the feeding schedule of pigeons. That is to say, while the "scientist" may change the activities of pigeons in the process of "shaping" them, he may also "maintain" these "shaped responses" until further changes should be made. Presumably the possibility of "scientific" "selection, shaping, and maintaining" of behavioral "responses" in pigeons reveals, to the practicing "scientist" in his "direct testing" activities, the methods whereby a grand cosmic evolutionary process operates to select the fittest "responses" and organisms for survival. Ordinary mortals may, however, find this jump by analogy a little too daring. They may find it difficult to believe that the "shaping" and "maintaining" of "responses" through food "reinforcers" indicates anything other than the "scientist's" control over an organism through his control over important consequences and how they are parcelled out. Ordinary mortals are more likely to believe that, given control over "reinforcers": "What a scientific

study does is to enable us to make optimal use of the control we possess."[6]

Since the publication of Walden Two in 1948, Skinner has apparently had notions of himself as the prophet for a new social order. At the time, his book was billed as "science fiction," not inappropriately, one might add. Some of the primary flights of fancy in Walden Two naturally had to do with "operant conditioning" and ran something like this: If the overt responses of individual human beings could be "shaped" (selectively reinforced) from earliest infancy on, and if "shaped responses" could subsequently be "maintained" in a "scientific" manner (intermittent reinforcement) by society, then only "desired" responses would be made by individuals in that given society.[7] The result of careful "scientific" selection of "desired" individual responses,

---

[6] Ibid., p. 21.

[7] B. F. Skinner, Walden Two (Toronto, Ontario: The MacMillan Company, Collier-MacMillan Canada, Ltd., 1962); Skinner seems to carefully avoid some issues which have come to concern other, less rigid, behaviorists. As the exponent of solely "positive reinforcement," Skinner ironically stresses that "a horse may be led to water" and may be made to drink "by arranging a history of severe deprivation," Science and Human Behavior, p. 32. Other behaviorists are beginning to mention that "you can lead a horse to water but no amount of conditioning will teach it to talk." See Martin Seligman and Joanne Hager, "Biological Boundaries of Learning"; The Sauce-Bearnaise Syndrom, Psychology Today: The Magazine About Psychology, Society, and Human Behavior, VI, No. 3 (August, 1972), 58-61, 84-87. This seems to, once again, raise the old question of biological boundaries to learning in animals. It also raises the question whether verbal behavior extends animal boundaries, and whether hasty analogies from animal to human behavior are sound.

as well as their shaping and maintenance through "scientific" procedures, would eventually be a Utopia of "functional relations" between individual and social environment. In other words, total control over important consequences for the individual would beget total conformity by the individual.

In Walden Two, the original "shaping of responses," as well as their subsequent maintainance through properly established "schedules of reinforcement," were entrusted to a fictional "scientific expert" called Frazier. It should perhaps be mentioned in passing that Frazier did need practical control over environmental "reinforcers," all the way from food to the "generalized" ones such as money, leisure, or verbal approval, to even establish his envisioned Utopian system of response-reinforcer "functional relations." This control Frazier was given by the first generation inhabitants of Walden Two, who entered the community under a sort of implicit Hobbesian social contract. This contract stipulated a fixed relation between governors (controllers) and governed (controlled) for themselves as well as for successive generations. Although, Frazier seemed to think that the role of human governor(s) would be temporary:

> Well, I suppose you could say that I gave the first push, but I'm not pushing now. There is no pushing, that's the point of the whole thing. Set it up right, and it will run by itself.[8] (italics mine.)

---

[8] Skinner, Walden Two, p. 234.

Frazier's task was apparently confined to setting the system up right, to get "the selective role of the environment in shaping and maintaining the behavior of the individual" started. The rest would presumably be automatic.

In the meantime, Skinner has, unfortunately, left the "science fiction" medium of expression. He has followed up on Walden Two with what purports to be serious "scientific" recommendations for an overwhelming ideological/political reform of society. His recommendations amount to the conscious, or unconscious, abandonment of an entire intellectual tradition. The scope of his suggested reform is, indeed, so vast it may well boggle the imagination of those who have any and do not disown it as a "fictitious entity." In his latest book, entitled Beyond Freedom and Dignity, Skinner advocates a large-scale "technology of behavior" to insure the survival of mankind. Such a technology

> . . . will not solve our problems, however, until it replaces traditional prescientific views, and these are strongly entrenched. Freedom and dignity illustrate the difficulty. They are the possessions of the autonomous man of traditional theory, and they are essential to practices in which a person is held responsible for his conduct and given credit for his achievements.[9] (italics mine.)

---

[9]Skinner, Beyond Freedom and Dignity, p. 25. Skinner's thought and endeavors provide a rather gross and continuous example of what philosophers tend to recognize as the "naturalistic fallacy." He constantly seems to confuse "what is" with "what ought to be," aside from his unwarranted generalizations from "what

Skinner does propose to abolish the concept of the "autonomous individual," the individual who has been traditionally conceived as the "nodal point" of various possible interactions with his environment, the individual assumed to make "esthetic judgments and judgments of value" preliminary to some interactions with his environment. There is, perhaps, but one stunned reply possible: How could so many thinkers have been so deceived for so long?

Skinner's latest "verbal behavior" in print confirms a suspicion which may have lurked in the mind of the autonomous reader since the publication of Science and Human Behavior in 1953. The "analytical unit" for the "scientific analysis of behavior" doubles as a political philosophy/action-program in the grandest of classical manners. As Skinner put it at the time:

> The conception of man which has emerged from the study of economic phenomena has been of little or no value in the field of psychotherapy. The conception of human behavior developed for use in the field of education has had little or nothing in common with that employed in explaining governmental or legal practices. A basic functional analysis, however, provides us with a common formulation of the behavior of the individual with which we may discuss issues in all these areas. . . . [10] (italics mine.)

---

is the case in the laboratory" to "what is the case universally." The fallacy seems unavoidable in one-dimensional thought, which does not recognize the importance of a psychological dimension in human activities generally and scientific endeavors specifically.

[10] Skinner, Science and Human Behavior, p. 40.

That is to say, a "functional analysis" operates from the definition of "behavior" as individual-response-controlled-by-environmental-reinforcer "functional relation." If this definition is accepted, previously differentiated economic, psychotherapeutical, educational, legal, or governmental activities of the "environment" are reducible to simple "reinforcement" control activities by the "environment." If the concept of the "autonomous" individual is replaced by the concept of the autonomous "functional relation," we may discuss issues in all areas of human interaction with environment in terms of the stipulated, universal "response-reinforcer" connection. The simplistic concept of man, which emerges from Skinner's "verbal behavior," is that of the coercively or compulsively "responding" part of an environmentally "reinforced" controlled situation.

Skinner's novel concept of man has implications in the conceptualization of the body politic. If the importance of personal autonomy is superseded by the importance of impersonal "functional relations," the basic unit in the body politic is no longer the individual person but the impersonal "functional relation." The activities of the body politic, traditionally and somewhat haphazardly oriented toward the goal of individual life, liberty, and pursuit of happiness would, presumably, have to be re-oriented toward the

establishment, protection, and expansion of "functional relations." Those blessed with imagination may envision the new body politic as a clockwork orange of interlocking, impersonal "functional relations," a clockwork mechanism kept ticking by the mediation of forces between individual and environment. If the religiously inspired half of Skinner is to be trusted, such a mechanism would represent a replica of the cosmic determistic-teleological causality at work through operant conditioning processes designed for the evolution of "behavior." In setting up such a clockwork orange, the "scientist" merely functions in the role of the Mesopotamian priest-king, who interpreted the will of the gods to the less fortunate.

CHAPTER VII

THE TECHNOLOGICAL SOCIETY AND EDUCATION

Would-be political reformers tend to be particularly interested in the education of the young. Skinner is no exception. Like others before him, he seems to follow the general assumption that reforms in social outlook on the world, and/or reforms in social interaction patterns, would have a greater chance of success among the young. From a Skinnerian perspective, what interaction patterns are developed by the young is still relatively easy to control through primary reinforcers, such as food. But the way to the education of the young leads through the cooperation or acquiescence of their elders, at least in countries with a democratic political orientation. Consequently, in 1968 Skinner produced a book entitled The Technology of Teaching. In this book he expounded the technology of teaching according to the gospel of the "analytical unit for the scientific analysis of behavior." Needless to say, his "analyses" told Skinner that social "reinforcement" control could be

made far more effective in schools and by teachers. If desired "responses" of students were selected and stipulated with greater accuracy in terms of "behavioral objectives," and if social "reinforcers" with proven "reinforcing effects" were more consistently applied and scheduled, then "a much more effective control of behavior" or changes in "behavior" could be achieved in education. In light of Skinner's ambiguous and/or circular definition of "behavior," which carries over into any area "analyzed," one might feel inclined to dismiss his pronouncements on education as having minimal empirical significance. But the hue and cry for an "educational technology" may make this course of action inadvisable.[1]

One cannot deny that, traditionally, teachers have been unable to agree on one comprehensive definition of the "teaching" relationship, on one suitable method for instruction, and on one type of technique to be used. At least some teachers have apparently had the bad taste to observe not "responses" but young people assembled in

---

[1]The hue and cry for an "educational technology" issues directly from the technologists in education, who are ready and willing to implement Skinnerian visions in schools. Robert Mager, for example, wrote a book entitled Preparing Instructional Objectives (Palo Alto, Calif.: Fearon Publishers, 1962), which provides a model for the replacement of "meaningless" teaching objectives with "behavioral objectives." For Mager, a specified goal of "music appreciation" is meaningless and should be translated into exhibited skill, such as playing a tune on an instrument. These direct efforts of the educational technologists are, however, indirectly supported by all those concerned with measuring "progress" and finding quantitative reasons to justify financial demands and/or appropriations.

their classrooms, lecture halls, or in sundry other places. To these teachers, young humans seemed to vary, notably on the basis of age, but also on the basis of temperament, disposition, and/or interests displayed. Perhaps as a result of a certain bewilderment and wonder about this seeming complexity of human beings, teachers have tended to make distinctions among teaching relationships on various levels of education, from kindergarten through the university. They made distinctions not only with regard to the type of "reinforcer" suitable for various levels of instruction, but also with regard to the type of method appropriate at the level of kindergarten teaching and at the level of college freshmen instruction. Since the temperament, disposition, and/or interests of teachers enter the discussions of "teaching relationships" as well, it is hardly surprising that issues have not been settled once and for all. If educational technologists are to be believed, some teachers resist agreement on a teaching technique to be used on any and all students as well. Unless the authority of a behavioral "science," backed by the political power to control, affects a change in this state of affairs along with an enforced unanimity, the debates are likely to continue among members of the teaching profession.[2]

---

[2]It is distinctly possible that the ranks of teachers contain many a two-dimensional man, whose one dimension extends into the material world of financial

In The Technology of Teaching, Skinner is evidently trying to bring the authority of a "science" of learning to bear on the adoption of operant conditioning techniques in education with all that this implies. Presumably, his "verbal behavior" is directed at those who have a say in education as administrators, or those who are directly engaged in the teaching process. In the beginning of his book, Skinner mentions that:

> Recent improvements in the conditions which control behavior in the field of learning are of two principal sorts. The Law of Effect has been taken seriously; we have made sure that effects do occur and that they occur under conditions which are optimal for producing the changes called learning.[3] (Italics mine.)

Before going on to the second "improvement" listed by Skinner, it is worthwhile to explore the implications of the underlined passage above by looking at an example. A mentally disturbed boy was "taught" to wear glasses in the following manner: The "scientist-teacher" first made sure "that effects do occur" in the organism by "allowing the child to go hungry." Given the child's hunger, food became an "effective reinforcer." Next the "scientist-teacher" exposed the boy to "conditions which were optimal for producing the changes called learning"

---

and social rewards, but whose second dimension extends into a psychological world of individual excellence and critical evaluation.

[3]Skinner, The Technology of Teaching, p. 10.

by putting him in an empty room with glasses frames about. Whenever the child made contact with glasses, he was reinforced with food. According to Skinner, in this "teaching" procedure, "Some difficulty was encountered in shaping the response of putting the frames on the face in the proper position."[4] Usually Skinner finds such a difficulty barely worth mentioning. Evidently he is convinced that the "response(s)" desired by the "scientist-teacher" are always attainable through proper application of an "effective reinforcer."

Once a "response" or "class of responses" from an organism has been linked to an "effective reinforcer" from the environment, "behavior" in the sense of a "functional relation" between the two has been established. At this point,

> A second important advance in technique permits us to maintain behavior in given states of strength for long periods of time. Reinforcements continue to be important, of course, long after an organism has learned to do something, long after it has acquired behavior. They are necessary to maintain the behavior in strength. Of special interest is the effect of various schedules of intermittent reinforcement.[5]

In the case of the boy who was "taught" to wear glasses, it seems fairly clear that his "acquired behavioral responses" would be maintained in strength by regular food "reinforcement." The "behavior" functional relation

---

[4] Ibid., p. 67.

[5] Ibid., p. 10.

to be maintained consists of a relatively simple "class of responses" under the control of quite primary a "reinforcer." From intermittent reinforcement schedules employed in such cases, Skinner infers that, "On the practical side we have learned how to maintain any given level of activity for daily periods limited only by the physical endurance of the organism and from day to day without substantial change throughout its life."[6] Whether available evidence warrants the generalization of this inference to a point which includes a highly complex "class of responses" and far more sophisticated types of "reinforcer" control is wide open to question. Evidence available from sources other than Skinnerian behaviorists suggests that the "effectiveness" of reinforcers may decline in direct proportion to their remoteness from the level of primary survival needs.[7]

---

[6] Ibid., p. 11.

[7] On the basis of research findings obtained from studies of relatively complex social interactions among human beings (verbalizing animals), Argyris' review of B. F. Skinner's Beyond Freedom and Dignity, p. 556, concluded that a schedule of positive reinforcement would be successful, if: "(1) the recipient of the reinforcement will interpret the reinforcement precisely as intended by the reinforcer; the recipient will not add his additional meanings to any given reinforcement; (2) the recipient will not add up reinforcements to generate a history of the relationship which, . . . could give new meaning to the relationship; (3) the recipient will not discuss the reinforcement program covertly or overtly, knowingly or unknowingly, with anyone else or himself."

If Skinner is to be taken seriously, the ideal type of "teaching" relationship seems to exist when "educational institutions"

(a) Can "make sure that effects do occur" in behavioral responses made by students;

(b) Control "conditions which are optimal for producing the changes called learning" in the environment.

Thus the prototype of the ideal "teaching" relationship may well have existed in the German concentration camps, or the forced labor camps established during World War II. In these "educational institutions" it was possible to insure the "effectiveness" of reinforcers, for example, by "allowing the organisms [student-inmates] to go hungry." The teacher-guards found it unnecessary to resort to either "conditioning" of reinforcers or "generalized reinforcers" in their practice of teaching.[8] "Conditions which were optimal for producing the changes called learning" were circumscribed by barbed wire, while

---

[8]Carl R. Rogers and B. F. Skinner, "Some Issues Concerning the Control of Human Behavior: A Symposium," in The Technological Threat, ed. by Jack D. Douglas, A Spectrum Book (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1971); The psychologist Carl Rogers put his finger on a crucial shortcoming in Skinner's thought: "I believe that in Skinner's presentation . . . there is a serious underestimation of the problem of power. To hope that the power which is being made available by the behavioral sciences will be exercised . . . by a benevolent group, seems to me a hope little supported by either recent or distant history."

they were punctuated by armed guards and gas chambers. Given "effective reinforcers" and "optimal conditions" for "learning," veritable marvels were achieved. Desired "responses" or a "class of responses" were "shaped at will" and "maintained in strength" as long as "the physical endurance of the organism" lasted. Teacher-guards were able to report phenomenal "rates of learning," along with absolute success in maintaining or "extinguishing" responses.[9] The progress of technology led to the triumph of technique--but the bankruptcy of the individual's subjectively "conscious experience" brought in its train the corruption of the human society's objectively "desirable" aims. The standard defense heard at the Nuremberg trials need hardly have been surprising: "I merely did my job as decreed by higher authority." Skinner provides the rationale for such a defense remarkably well:

> Freedom and dignity . . . are the possessions of the autonomous man of traditional theory. . . . A scientific analysis shifts both the responsibility and the achievement to the environment.[10]

---

[9]Bruno Bettelheim, The Informed Heart: Autonomy in a Mass Age, Avon Books (New York: Avon Publishers of Bard, Camelot, Discus and Equinox Books, 1971); Out of the psychologist Bruno Bettelheim's experience in German concentration camps came one of the more thought-provoking books of recent times. Bettelheim does not offer any closed models of individual-social-environment interaction in general. He notes that what he called the "extreme environment" of the concentration camp had somewhat different effects on different people, leaving the "why" to be explored further.

[10]Skinner, Beyond Freedom and Dignity, p. 25.

It remains to be devoutly hoped that "traditional theory" will never be entirely supplanted by modern "scientific" practice.

In the verbal behavior of Skinner and his followers, attempts are made to invoke the authority of "science" to preach authoritative social control. The acceptance of "teaching techniques" of the operant conditioning variety obviously has political implications and consequences, since such an acceptance requires a particular conceptualization of the teaching relationship as well as the aim of education. The universal definition of their relationship(s) to students, which seems to have eluded teachers, has been supplied by Skinner: " . . . teaching is simply the arrangement of contingencies of reinforcement."[11] When "reinforcement control" has been elevated to the authoritative teaching method and is buttressed by the application of reinforcement techniques, the aim of education becomes quite clear. This aim is simply the establishment of "functional relations" between individual students and their social environment, in which the environment alone controls the needs, wants, and desires of the individual through control of the means for their satisfaction.

One may fervently hope that teachers as individuals, and as members of an increasingly organizing

---

[11]Skinner, The Technology of Teaching, p. 5.

profession, will continue to persist in questioning "the relations between means and ends," the relations between teaching methods, teaching techniques, and the professed ends of education. Far from being the result of "a failure to understand," as the educational technologist Cohen put it, such questioning may rather be the result of an attempt to understand better those interrelations which are forever bound to elude complete comprehension. By general political contract, the aim of education in our society should be the largest possible self-governance of the individual, his largest possible choice over his life-style, use of liberty, and pursuit of happiness, as long as he allows the same rights to others. It does not require concentrated thought to conclude that this ideal aim of education cannot even be remotely approached with methods dictating the social control/manipulation of individual needs, wants, and desires; nor can this aim be remotely approached with teaching techniques designed to make such control maximally effective through conditioning of individual needs, wants, and desires from early infancy on. To what extent such an ideal aim of education may be realized at any given time, and to what extent such an aim is realizable with different students remains a matter for perennial inquiry and evaluation. Some questions, by their very nature, concern dynamic processes of interaction and are not

answerable unless dynamic processes are squeezed into the rationalistically fashioned, straight-jacket of "reinforcement control" buckled tight by "operant conditioning" techniques.

The educational technologist seems only too willing to echo the sentiments of the "scientific" expert, and to interpret "the relations between means and ends" according to the gospel of the "analytical unit for the scientific analysis of behavior": " . . . in the schools, the means are the instructional sequences and the campus environment, the ends are the learning achieved by the students."[12] (italics mine.) While the language is even more vague than that of the "scientific" expert, the intent of this verbal display becomes somewhat clearer in the course of the article, particularly in some of the conclusions:

> The fact that instructors (in colleges) fail to perceive the usefulness and importance of (behavioral) objectives . . . may relate to their feelings of self-centeredness. A full commitment . . . demands a role shift . . . students can learn as well with or without the intervention of the instructor. . . . The institution should be designed as a place where students obtain specific objectives. . . . The instructor who is excessively concerned with self cannot open the door to that contingency.
>
> . . . These findings call into question the entire move toward instructor-made or instructor-selected objectives.[13]

---

[12]Cohen, "Technology: Thee or Me?" 60.

[13]One might be hard put to find a better illustration for Ellul's, The Technological Society, pp. 92-93, point that: " . . . the individual's role is less and

Quite obviously, the instructor "who is excessively concerned with self," his "self" as well as the inferred "self" of others, has an improper focus on the educational enterprise in colleges and in education generally. Therefore, he simply cannot understand that the one and only aim of education is the establishment of response-reinforced "functional relations" between students and social reinforcers. In consequence, the instructor does not behave properly in his role of reinforcer-sequencer. Apparently he insists on cluttering up his interaction with "responders" by interjecting his "fictitious" self into the proceedings, and by talking about his subjective "conscious experience" as if it were a relevant "fact."

Despite his generously professed verbal interest in the "learning of students," the educational technologist's concern does not center on the "student" but on the measurability of his "learning." Like technologists in other areas of human endeavor, he does not take his cue from the humanist with his interest in perception, cognitive processes, or problems of human motivation. The educational technologist takes his cue instead from the social planner and organizer, intent on bringing

---

less important in technical evolution. . . . Henceforth, men will be able to act only in virtue of their commonest and lowest nature, and not in virtue of what they possess of superiority and individuality. The qualities which technique requires for its advance are precisely those characteristics of a technical order which do not represent individual intelligence." (italics mine.)

about a combination of resources which will yield maximum production at a minimum of expenditure. Historically, the subjective "conscious experience" of teachers and students has not only been difficult to assess, it may have been the undesirable source of a challenge or criticism of social control. All this may be avoided by shifting the focus of "education" to the establishment of "functional relations" between individual "responses" and social "reinforcements."[14] Such a shift makes it possible to measure progress in "education" by clearly defining the role of the "learner" as well as the "teacher." If an "expert" stipulates the "behavioral objectives" which precisely state what "responses" of students are socially desired, and if the "learning" of these responses is solely the result of proper "reinforcement" techniques, then "progress" in education is perfectly measurable. It is qualitatively measurable in terms of whether "behavioral objectives" have been produced by teachers, and it is quantitatively measurable in terms of how many desired "responses" have been

---

[14] In other words, by shifting the focus of "education" to the transmission of socially desired skills, by making "teaching" a relation between responders controlled by reinforcers, and by elevating one-dimensionality of thought and behavior to a universal good, any opposition to the status quo will be minimized or eliminated, along with the psychological dimension of individuals whence critical evaluation has its source. "Progress" will mean the "happy" conflict-free society, barren of dissenters and disagreeing individuals.

acquired by a student and how long he emits them. As individuals, teachers have probably hit upon these and similar expedients of evaluation before, but they apparently managed to entertain a few degrees of uncertainty about expediency as a universal standard.

Perhaps the recalcitrant instructors encountered by Cohen and other educational technologists have been corrupted by exposure to the Western intellectual tradition, or even by a study of intellectual history. They perpetuate the biases of two millenia of believers in their own "fictitious" mind, who were considerate enough to extend the right to the same "fiction" to others. They have not yet shed their conscious ways of perceiving and conceptualizing a world of independent phenomena, their ways of evaluating different conceptualizations, and of making aesthetic judgments or judgments of value based on their own sentiments or experience. Above all, these instructors may have been corrupted by exposure to the history of science and the reflections of old-fashioned scientists, who seem to agree with philosophers that science does not provide absolute answers, that "truth" is relative, and "certainty" should fluctuate in accord with perceptual frames or values applied by man in his efforts to interpret or measure a fleeting "reality." They may agree with Max Planck that there is an "irrational core at the center"

of even the most carefully conceived human endeavor, which no amount of "limiting by definition the task of science" or of teaching can remove. They may agree with Charles Sanders Peirce that the Skinnerian type of "scientist" is not a scientist at all, but a "practical man," bound and determined to sell his definition of "happiness" to the rest of mankind along with a collective lobotomy. These instructors may ask themselves why the educational technologist seems so anxious to support this "scientific" vision, and to translate it into practice. They may wonder with Erich Fromm whether technologists crave "certainty" more than a measure of human "autonomy,"[15] whether technologists are intent on accepting the authority of "technique" to rid themselves of the "painful tension" of doubt, and whether technologists are determined to combat the uncertainties of human existence by gradually eliminating the range of meaningful individual choice.

The measurement, control, and planning of tangible resources, which seems to characterize the technological approach to the world, may bestow a feeling of security on those engaged in measuring, controlling, or planning. But there is a price to pay for this feeling of security. In return for measurability, human interactions have to

---

[15]As Argyris' review on B. F. Skinner's Beyond Freedom and Dignity, p. 556, put the matter: "One would predict that the world Skinner designs requires human beings who enjoy, rather than resist, dependent relationships and whose influence on the environment is minimal."

be standardized, reduced to their most common denominator by definition; human interactions have to be broken down into specialized roles, to be petrified into stereotyped job descriptions. If the Skinnerian type "scientists" have their way, Marcuse's "one-dimensional" man is well on his way to reality. The "one-dimensional" thought of these "scientists," their narrow-minded empiricism and disregard for the exploration of ethical values, will work toward an age of one-dimensional behavior. The new image of man will be that of an involuntarily "responding" organism, devoid of independent critical judgment, devoid of personal moral sentiments, devoid of subjective aesthetic sensibilities. In this dawning "scientific" golden age we may look forward to the re-creation of man in the image of the new god--no doubt man will become a replacement part in the machinery of rationalized social interactions when his immediate and automatic identification with his prescribed social role is complete.

Traditional education was supposed to forestall any hasty moves toward major "role shifts" by unwittingly cooperating individuals. A certain type of "role shift" seems to rest on premises not altogether new in human history,[16] although these premises may flower into a

---

[16]The centralization of control and the elimination of opposition have ever been the aim of dictators, of Grand Inquisitors, and of zealots in a holy cause.

variety of forms and blossom under a variety of verbage. To find an example par excellence, if not a rational/practical reduction to absurdity, of what Ellul calls the "technological phenomenon" one need but look at a Skinnerian type "scientific" enterprise. As a point of historical interest, such a "science" bears favorable comparison with the best authoritative doctrines religious zealots of the past had to offer. In the name of the physical "survival" of man, such a "science" advocates the one "best means" to govern human interactions, the one "best method" of reinforcement-control, backed by the one "best technology" for the practical control of social relationships. This science is a jealous "science," which issues the demand: "Thou shalt not accept" other methods and techniques as equally "effective." It calls for the complete subordination of "autonomous man" to the "autonomy of technique," and for the submission of the individual will to the fate pre-destined by "technological necessity." To complete the circle, this "necessity" need but be projected unto the universe at large, in form of a deterministic-teleological causality shaping the evolution of species, to provide the element of authority bestowed by divine power. With this final step, no doubt, "technique" may be irrevocably elevated in the "fictitious" minds of true behavers. It simply becomes

the tangible expression of the divine will, the instrument of God, wielded by the "scientific" expert.

The new eschatological vision promises to true behavers a heaven on earth in the shape of a giant pyramid of "functional relations," hierarchically stratified into successive layers of reinforcement-control, segmented into compartments of reinforcer-roles, impersonally animated by the forces emanating from millions of organisms interacting with their environment. When he makes the "role shift" to an impersonal animating force, the true behaver will forever leave behind the uncertainties inherent in his individual existence, he will forever relinquish the "painful tension" of doubt. The gods and expert willing, he will find sustenance, health, and animal satisfaction provided in his antiseptic social niche, via the familiar reinforcement patterns. Only the doubting Thomas may wonder whether the old, old saying is true: "When divine power plans evil for a man, it first injures his mind."

BIBLIOGRAPHY

BIBLIOGRAPHY

Books

Bettelheim, Bruno. The Informed Heart: Autonomy in a Mass Age. New York: Avon Publishers of Bard, Camelot, Discus and Equinox Books, 1971.

Bonner, Hubert. On Being Mindful of Man: Essay Toward a Proactive Psychology. Edited by John E. Horrocks. Boston: Houghton Mifflin Company, 1965.

Ellul, Jacques. The Technological Society. Translated by John Wilkinson. New York: Vintage Books, 1964.

Evans, Richard I., and Skinner, B. F. B. F. Skinner, The Man and His Ideas (A Dialogue) New York: E. P. Dutton & Co., Inc., 1968.

Feigl, H., and Scriven, M., eds. The Foundations of Science and the Concepts of Psychology and Psychoanalysis. Minneapolis: University of Minnesota Press, 1956.

Fromm, Erich. Escape From Freedom. New York: Farrar and Rinehart, Inc., 1941.

_____. Man for Himself: An Inquiry into the Psychology of Ethics. New York: Holt, Rinehart and Winston, 1960.

_____. The Revolution of Hope: Toward a Humanized Technology. New York: Bantam Books, 1968.

Gerth, H. H., and Mills, C. W., eds. From Max Weber: Essays in Sociology. Translated by H. H. Gerth and C. W. Mills. New York: Oxford University Press, 1958.

Mager, Robert. Preparing Instructional Objectives. Palo Alto, Calif.: Fearon Publishers, 1962.

Marcuse, Herbert. Eros and Civilization: A Philosophical Inquiry Into Freud. New York: Vintage Books, 1955.

_____. One-Dimensional Man: Studies in the Ideology of Advanced Industrial Society. Boston: Beacon Press, 1968.

Matson, Floyd W., ed. Being, Becoming, and Behavior: The Psychological Sciences. New York: George Braziller, Inc., 1967.

Obler, Paul C., and Estrin, Herman A., eds. The New Scientist: Essays on the Methods and Values of Modern Science. New York: Doubleday & Company, Inc., 1962.

Peirce, Charles Sanders. Essays in the Philosophy of Science. Edited by Vincent Thomas. New York: The Bobbs-Merrill Company, Inc., 1957.

Planck, Max. The Philosophy of Physics. Translated by W. H. Johnston. New York: W. W. Norton & Company, Inc., 1936.

Rogers, Carl R., and Skinner, B. F. "Some Issues Concerning the Control of Human Behavior: A Symposium." The Technological Threat. Edited by Jack D. Douglas. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1971.

Skinner, B. F. The Behavior of Organisms: An Experimental Analysis. New York: Appleton-Century-Crofts, Inc., 1938.

_____. Beyond Freedom and Dignity. New York: Alfred A. Knopf, 1971.

_____. Cumulative Record. New York: Appleton-Century-Crofts, Inc., 1961.

_____. Science and Human Behavior. New York: Collier-MacMillan Limited, 1953.

_____. The Technology of Teaching. New York: Meredith Corporation, Educational Division, 1968.

_____. Verbal Behavior. New York: Appleton-Century-Crofts, Inc., 1957.

_____. Walden Two. Toronto, Ontario: The MacMillan Company, 1962.

Toffler, Alvin. Future Shock. New York: Bantam Books, 1971.

Wann, T. W., ed. Behaviorism and Phenomenology: Contrasting Bases for Modern Psychology. Chicago: The University of Chicago Press, 1964.

Journals

Argyris, Chris. Essay review of B. F. Skinner's Beyond Freedom and Dignity. Harvard Educational Review, XLI, No. 4 (November, 1971), 550-67.

Black, Max. "A Disservice to All." The Center Magazine: A Publication of the Center for the Study of Democratic Institutions, V, No. 2 (March/April, 1972), 53-58.

Cohen, Arthur M., ed. "Technology: Thee or Me?" Educational Technology, X, No. 11 (November, 1970), 57-60.

Kaufman, Arnold S. "The Aims of Scientific Activity." The Monist, LII, No. 3 (July, 1968), 374-89.

Platt, John. "A Revolutionary Manifesto." The Center Magazine: A Publication of the Center for the Study of Democratic Institutions, V, No. 2 (March/April, 1972), 34-52.

Seligman, Martin, and Hager, Joanne. "Biological Boundaries of Learning: The Sauce-Béarnaise Syndrome." Psychology Today: The Magazine About Psychology, Society, and Human Behavior, VI, No. 3 (August, 1972), 58-61.

Skinner, B. F. "Are Theories of Learning Necessary?" The Psychological Review: American Psychological Association, Inc., LVII (July, 1950), 193-216.

_____. "Beyond Freedom and Dignity." Psychology Today: The Magazine about Psychology, Society, and Human Behavior, V, No. 3 (August, 1971), 33-76.

_____. "The Machine That Is Man." Psychology Today: The Magazine About Psychology, Society, and Human Behavior, II, No. 11 (April, 1969), 21-25, 60-63.

Skinner, B. F. "Pigeons in a Pelican." The American Psychologist, XV (January, 1960), 28-37.

Suter, Ronald. "Paul Ziff on Behaviorism." Michigan Academician: Papers of the Michigan Academy of Science, Arts, and Letters, III, No. 1 (Summer, 1970), 19-23.

Toynbee, Arnold. "An Uneasy Feeling of Unreality." The Center Magazine: A Publication of the Center for the Study of Democratic Institutions, V, No. 2 (March/April, 1972), 58-62.