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real social world, in which determinable "probabilities of response" are so slight as to have virtually no predictive value. And it would be not absurd but grotesque to argue that since circumstances can be arranged under which behavior is quite predictable — as in a prison, for example, or the concentration camp society "designed" above — therefore there need be no concern for the freedom and dignity of "autonomous man." When such conclusions are taken to be the result of a "scientific analysis," one can only be amazed at human gullibility.

Skinner confuses "science" with terminology. He apparently believes that if he rephrases commonplace "mentalistic" expressions with terminology derived from the laboratory study of behavior, but deprived of whatever content this terminology has within this discipline, then he has achieved a scientific analysis of behavior. It would be hard to conceive of a more striking failure to comprehend even the rudiments of scientific thinking. The public may well be deceived, in view of the prestige of science and technology. It may even choose to be misled into agreeing that concern for freedom and dignity must be abandoned, perhaps out of fear and a sense of insecurity about the consequences of a serious concern for freedom and dignity. The tendencies in our society that lead toward submission to authoritarian rule may prepare individuals for a doctrine that can be interpreted as justifying it.

The problems that Skinner discusses — it would be more proper to say "circumvents" — are often real enough. In spite of his curious belief to the contrary, his libertarian and humanist opponents do not object to "design of a culture," that is, to creating social forms that will be more conducive to the satisfaction of human needs, though they differ from Skinner in their intuitive perception of what these needs truly are. They would not, or at least should not, oppose scientific inquiry or, where possible, its applications, though they will no doubt dismiss the travesty that Skinner presents.

there is an intrinsic human inclination toward free creative inquiry and productive work, and humans are not merely dull mechanisms formed by a history of reinforcement and behaving predictably with no intrinsic needs apart from the need for physiological satiation. Then humans are not fit subjects for manipulation, and we will seek to design a social order accordingly. But we cannot, at present, turn to science for insight into these matters. To claim otherwise is pure fraud. For the moment, an honest scientist will admit at once that we understand virtually nothing, at the level of scientific inquiry, with regard to human freedom and dignity.

There is, of course, no doubt that behavior can be controlled, for example, by threat of violence or a pattern of deprivation and reward. This much is not at issue, and the conclusion is consistent with a belief in "autonomous man." If a tyrant has the power to require certain acts, whether by threat of punishment or by allowing only those who perform these acts to escape from deprivation (e.g., by restricting employment to such people), his subjects may choose to obey — though some may have the dignity to refuse. They will understand the difference between this compulsion and the laws that govern falling bodies.

Of course, they are not free. Sanctions backed by force restrict freedom, as does differential reward. An increase in wages, in Marx's phrase, "would be nothing more than a better remuneration of slaves, and would not restore, either to the worker or to the work, their human significance and worth." But it would be absurd to conclude merely from the fact that freedom is limited, that "autonomous man" is an illusion, or to overlook the distinction between a person who chooses to conform, in the face of threat or force or deprivation, and a person who "chooses" to obey Newtonian principles as he falls from a high tower.

The inference remains absurd even where we can predict the course of action that most "autonomous men" would select, under conditions of extreme duress and limited opportunity for survival. The absurdity merely becomes more obvious when we consider the

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Suppose that humans happen to be so constructed that they desire the opportunity for freely undertaken productive work. Suppose that they want to be free from the meddling of technocrats and commissars, bankers and tycoons, mad bombers who engage in psychological tests of will with peasants defending their homes, behavioral scientists who can't tell a pigeon from a poet, or anyone else who tries to wish freedom and dignity out of existence or beat them into oblivion. Do we then "design our culture" to achieve these ends (which, of course can be given an appropriate Skinnerian translation)? There are no answers to any of these questions in Skinner's science, in spite of his claim that it accommodates (fully, it seems) consideration of "values." For this reason his approach could be as congenial to an anarchist as to a Nazi, as has already been noted.

The libertarians and humanists whom Skinner scorns object to totalitarianism out of respect for freedom and dignity. But, Skinner argues, these notions are merely the residue of traditional mystical beliefs and must be replaced by the stern scientific notions of behavioral analysis. However, there exists no behavioral science incorporating empirically supported propositions that are not trivial and that apply to human affairs or support a behavioral technology. For this reason Skinner's book contains no clearly formulated substantive hypotheses or proposals. We can at least begin to speculate coherently about the acquisition of certain systems of knowledge and belief on the basis of experience and genetic endowment, and can outline the general nature of some device that might duplicate aspects of this achievement. But how does a person who has acquired systems of knowledge and belief then proceed to use them in his daily life? About this we are entirely in the dark, at the level of scientific inquiry.

If there were some science capable of treating such matters it might well be concerned precisely with freedom and dignity and might suggest possibilities for enhancing them. Perhaps, as the classical literature of freedom and dignity sometimes suggests,

is morally wrong because it has deferred aversive consequences (p. 174). But in the delightful culture we have just designed there should be no aversive consequences, immediate or deferred. Unwanted behavior would be eliminated from the start by the threat of the crematoria and the all-seeing spies. Thus all behavior would be automatically "good," as required. There would be no punishment. Everyone would be reinforced — differentially, of course, in accordance with his ability to obey the rules.

Within Skinner's scheme there is no objection to this social order. Rather, it seems close to ideal. Perhaps we could improve it still further by noting that "the release from threat becomes more reinforcing the greater the threat" (as in mountain climbing — p. 111). We can, then, enhance the total reinforcement and improve the culture by devising a still more intense threat, say, by introducing occasional screams, or by flashing pictures of hideous torture as we describe the crematoria to our fellow citizens. The culture might survive, perhaps for 1,000 years.

Though Skinner's recommendations might be read in this way, it would be improper to conclude that Skinner is advocating concentration camps and totalitarian rule (though he also offers no objection). Such a conclusion overlooks a fundamental property of Skinner's science, namely, its vacuity. Though Skinner seems to believe that "survival of a culture" is an important value for the behavioral technologist, he fails to consider the questions that arise at once. When the culture changes, has it survived or died? Suppose that it changes in such a way as to extend the basic individual rights that Skinner personally regards as outdated (p. 180f). Is this survival or death? Do we want the 1,000-year Reich to survive? Why not, if survival of the culture functions as a value for the behavioral technologist? Suppose that in fact people are "reinforced" by (that is, prefer) reduction of sanctions and differential reinforcement. Do we then design the culture so as to lead to this result, thus diminishing effective controls rather than extending them, as Skinner urges?

I

A century ago, a voice of British liberalism described the "Chinaman" as "an inferior race of malleable orientals."[1] During the same years, anthropology became professionalized as a discipline, "intimately associated with the rise of raciology."[2] Presented with the claims of nineteenth-century racist anthropology, a rational person will ask two sorts of questions: What is the scientific status of the claims? What social or ideological needs do they serve? The questions are logically independent, but the second type of question naturally comes to the fore as scientific pretensions are undermined. The question of the scientific status of nineteenth-century racist anthropology is no longer seriously at issue, and its social function is not difficult to perceive. If the "Chinaman" is malleable by nature, then what objection can there be to controls exercised by a superior race?

Consider now a generalized version of the pseudo-science of the nineteenth century: it is not merely the heathen Chinese who are malleable by nature, but rather all people. Science has revealed that it is an illusion to speak of "freedom" and "dignity." What a person does is fully determined by his genetic endowment and history of "reinforcement." Therefore we should make use of the best behavioral technology to shape and control behavior in the common interest.

Again, we may inquire into the exact meaning and scientific status of the claim, and the social functions it serves. Again, if the scientific status is slight, then it is particularly interesting to consider the climate of opinion within which the claim is taken seriously.

[1] Economist, October 31, 1862. Cited by Frederick F. Clairmonte, review of R. Segal, The Race War, Journal of Modern African Studies, forthcoming.

[2] Marvin Harris, The Rise of Anthropological Theory (Crowell: 1968), pp. 100–1. By the 1860s, he writes, "anthropology and racial determinism had become almost synonyms."

In his speculations on human behavior, which are to be clearly distinguished from his experimental investigations of conditioning behavior, B. F. Skinner offers a particular version of the theory of human malleability. The public reception of his work is a matter of some interest. Skinner has been condemned as a proponent of totalitarian thinking and lauded for his advocacy of a tightly managed social environment. He is accused of immorality and praised as a spokesman for science and rationality in human affairs. He appears to be attacking fundamental human values, demanding control in place of the defense of freedom and dignity. There seems something scandalous in this, and since Skinner invokes the authority of science, some critics condemn science itself, or "the scientific view of man," for supporting such conclusions, while others assure us that science will "win out" over mysticism and irrational belief.

A close analysis shows that the appearance is misleading. Skinner is saying nothing about freedom and dignity, though he uses the words "freedom" and "dignity" in several odd and idiosyncratic senses. His speculations are devoid of scientific content and do not even hint at general outlines of a possible science of human behavior. Furthermore, Skinner imposes certain arbitrary limitations on scientific research which virtually guarantee continued failure.

As to its social implications, Skinner's science of human behavior, being quite vacuous, is as congenial to the libertarian as to the fascist. If certain of his remarks suggest one or another interpretation, these, it must be stressed, do not follow from his "science" any more than their opposites do. I think it would be more accurate to regard Skinner's Beyond Freedom and Dignity as a kind of Rorschach test. The fact that it is widely regarded as pointing the way to 1984 is, perhaps, a suggestive indication of certain tendencies in modern industrial society. There is little doubt that a theory of human malleability might be put to the service of totalitarian doctrine. If, indeed, freedom and dignity are merely the relics of outdated mystical beliefs, then what objection can there be to nar-

(pp. 74 and 81). The literature of freedom would, quite properly, reject and abhor such controls.

In fact, there is nothing in Skinner's approach that is incompatible with a police state in which rigid laws are enforced by people who are themselves subject to them and the threat of dire punishment hangs over all. Skinner argues that the goal of a behavioral technology is to "design a world in which behavior likely to be punished seldom or never occurs" — a world of "automatic goodness" (p. 66). The "real issue," he explains, "is the effectiveness of techniques of control" which will "make the world safer." We make the world safer for "babies, retardates, or psychotics" by arranging matters so that punishable behavior rarely occurs. If only all people could be treated in this way, "much time and energy would be saved" (pp. 66 and 74).

Skinner even offers some indications, perhaps unintentionally, of how this benign environment might be brought into being:

A state which converts all its citizens into spies or a religion which promotes the concept of an all-seeing God makes escape from the punisher practically impossible, and punitive contingencies are then maximally effective. People behave well although there is no visible supervision. (Pp. 67–68.)

Elsewhere, we learn that freedom "waxes as visible control wanes" (p. 70). Therefore the situation just described is one of maximal freedom, since there is no visible control. Furthermore, since "our task" is simply "to make life less punishing" (p. 81), the situation just described would seem ideal. Since people behave well, there will be no punishing. In this way, we can progress "toward an environment in which men are automatically good" (p. 73).

Extending these thoughts, let us consider a well-run concentration camp with inmates spying on one another and the gas ovens smoking in the distance, and perhaps an occasional verbal hint as a reminder of the meaning of this reinforcer. It would appear to be an almost perfect world. Skinner claims that a totalitarian state

of happiness are basic rights…[but] …they have only a minor bearing on the survival of a culture" (p. 180f.). One might wonder, then, what importance they have for the behavioral technologist who takes the survival of the culture as a value. It may be these and similar recommendations, to which we shall turn directly, that lead some readers to believe that Skinner is advocating a form of totalitarian control.

There is no doubt that in his specific recommendations, vague though they are, Skinner succeeds in differentiating his position from the "literature of freedom." Skinner claims that the latter has "overlooked…control which does not have aversive consequences at any time" (p. 41) and has encouraged opposition to all control, whereas he is proposing a much more extensive use of controls that have no aversive consequences. The most obvious form of control of this benign type is differential wages. It is, of course, incorrect to say that the "literature of freedom" has overlooked such controls. Since the industrial revolution, it has been much concerned with the problems of "wage slavery" and the "benign" forms of control that rely on deprivation and reward rather than direct punishment. This concern clearly distinguishes the literature of freedom from Skinner's social concepts.

Or consider freedom of speech. Skinner's approach suggests that control of speech by direct punishment should be avoided, but that it is entirely appropriate for speech to be controlled, say, by restricting good jobs to people who say what is approved by the designer of the culture. In accordance with Skinner's ideas, there would be no violation of "academic freedom" if promotions were granted only to those who conform, in their speech and writing, to the rules of the culture, though it would be wrong to go farther and punish those who deviate by saying what they believe to be true. Such deviants must simply remain in a state of deprivation. In fact, by giving people strict rules to follow, so that they know just what to say to be "reinforced" by promotion, we will be "making the world safer" and thus achieving the ends of behavioral technology

row and effective controls instituted to ensure "the survival of a culture"?

In view of the prestige of science and the tendencies toward centralized authoritarian control which can easily be detected in modern industrial society, it is important to investigate seriously the claim that the science of behavior and a related technology provide the rationale and the means for control of behavior. What, in fact, has been demonstrated, or even plausibly suggested in this regard?

Skinner assures us repeatedly that his science of behavior is advancing mightily and that there exists an effective technology of control. It is, he claims, a "fact that all control is exerted by the environment" (p. 82). Consequently, "When we seem to turn control over to a person himself, we simply shift from one mode of control to another" (p. 97). The only serious task, then, is to design less "aversive" and more effective controls, an engineering problem. "The outlines of a technology are already clear" (p. 149). "We have the physical, biological, and behavioral technologies needed 'to save ourselves'; the problem is how to get people to use them" (p. 158).

It is a fact, Skinner maintains, that "behavior is shaped and maintained by its consequences" and that as the consequences contingent on behavior are investigated, more and more "they are taking over the explanatory functions previously assigned to personalities, states of mind, feelings, traits of character, purposes, and intentions" (p. 18).

As a science of behavior adopts the strategy of physics and biology, the autonomous agent to which behavior has traditionally been attributed is replaced by the environment — the environment in which the species evolved and in which the behavior of the individual is shaped and maintained. [P. 184.]

A "behavioral analysis" is thus replacing the "traditional appeal to states of mind, feelings, and other aspects of the autonomous man," and "is in fact much further advanced than its critics usu-

ally realize" (p. 160). Human behavior is a function of "conditions, environmental or genetic," and people should not object "when a scientific analysis traces their behavior to external conditions" (p. 75), or when a behavioral technology improves the system of control.

Not only has all of this been demonstrated, according to Skinner, but as the science of behavior progresses, it will, inevitably, more fully establish these facts. "It is in the nature of scientific progress that the functions of autonomous man be taken over one by one as the role of the environment is better understood" (p. 58). This is the "scientific view," and "it is in the nature of scientific inquiry" that the evidence should shift in its favor (p. 101). "It is in the nature of an experimental analysis of human behavior that it should strip away the functions previously assigned to autonomous man and transfer them one by one to the controlling environment" (p. 198). Furthermore, physiology some day "will explain why behavior is indeed related to the antecedent events of which it can be shown to be a function" (p. 195).

These claims fall into two categories. In the first are claims about what has been discovered; in the second, assertions about what science must discover in its inexorable progress. It is likely that the hope or fear or resignation induced by Skinner's proclamations results, in part, from his assertions that scientific progress will inevitably demonstrate both that all control is exerted by the environment and that the ability of "autonomous man" to choose is an illusion.

Claims of the first sort must be evaluated according to the evidence presented for them. In the present instance, this is a simple task, since no evidence is presented, as will become clear when we turn to more specific examples. In fact, the question of evidence is beside the point, since the claims dissolve into triviality or incoherence under analysis. Claims with regard to the inevitability of future discoveries are more ambiguous. Is Skinner saying that, as a matter of necessity, science will show that behavior is completely

and depletion of resources are a problem, "we may then change practices to induce people to have fewer children, spend less on nuclear weapons, stop polluting the environment, and consume resources at a lower rate, respectively" (p. 152).

The reader may search for more profound thoughts than these. He may seek, but he will not find.

Skinner alludes more frequently in this book to the role of genetic endowment than he did in his earlier speculations about human behavior and society. One would think that this would lead to some modification in his conclusions, or to new conclusions. It does not, however. The reason is that Skinner is as vague and uninformative about genetic endowment as he is about control by contingencies of reinforcement. Unfortunately, zero plus zero still equals zero.

III

Let us consider now the matter of "design of a culture." The principles of Skinner's "science" tell us nothing about designing a culture, but that is not to say that Skinner leaves us completely in the dark about what he has in mind. He believes that "the control of the population as a whole must be delegated to specialists — to police, priests, owners, teachers, therapists, and so on, with their specialized reinforcers and their codified contingencies" (p. 155). The controller and the designer of a culture should be members of the group that is controlled (p. 172). When the technology of behavior is "applied to the design of a culture, the survival of the culture functions as a value." If our culture "continues to take freedom or dignity, rather than its own survival, as its principal value, then it is possible that some other culture will make a greater contribution to the future."

The refusal to exercise available controls, Skinner continues, may be "a lethal cultural mutation." "Life, liberty, and the pursuit

Or consider the claim that "we are likely to admire behavior more as we understand it less" (p. 53). In a strong sense of "explain," it follows that we admire virtually all behavior, since we can explain virtually none. In a looser sense, Skinner is claiming that if Eichmann is incomprehensible to us, but we understand why the Vietnamese fight on, then we are likely to admire Eichmann but not the Vietnamese resistance. Similarly, Skinner asserts, "Except when physically restrained, a person is least free or dignified when he is under threat of punishment" (p. 60). Thus someone who refuses to bend to authority in the face of severe threat has lost his dignity.

The real content of Skinner's system can be appreciated only by examining such cases, point by point. The careful reader will discover that in each case a literal interpretation of Skinner's statements, where terminology is understood in something like the technical sense, yields obvious falsehood, and that a loose metaphorical interpretation does permit the translation of the familiar descriptive and evaluative vocabulary of ordinary discourse into Skinner's terms, of course with a loss of precision and clarity, in view of the poverty of his system.

We can get a taste of the explanatory force of Skinner's theory from such (typical) examples as these: a pianist learns to play a scale smoothly because "smoothly played scales are reinforcing" (p. 204); "A person can know what it is to fight for a cause only after a long history during which he has learned to perceive and to know that state of affairs called fighting for a cause" (p. 190); and so on.

Similarly, we can perceive the power of Skinner's behavioral technology by considering the useful observations and advice he offers: "Punishable behavior can be minimized by creating circumstances in which it is not likely to occur" (p. 64). If a person "is strongly reinforced when he sees other people enjoying themselves,...he will design an environment in which children are happy" (p. 150). If overpopulation, nuclear war, pollution,

determined by the environment? If so, his claim can be dismissed as pure dogmatism, foreign to the "nature of scientific inquiry." It is quite conceivable that as scientific understanding advances, it will reveal that even with full details about genetic endowment and personal history, a Laplacean omniscience could predict very little about what an organism will do. It is even possible that science may some day provide principled reasons for this conclusion (if indeed it is true).

But perhaps Skinner is suggesting merely that the term "scientific understanding" be restricted to the prediction of behavior from environmental conditions. If so, then science may reveal, as it progresses, that "scientific understanding of human behavior," in this sense, is inherently limited. At the moment we have virtually no scientific evidence and not even the germs of an interesting hypothesis about how human behavior is determined. Consequently, we can only express our hopes and guesses about what some future science may demonstrate. In any event, the claims that Skinner puts forth in this category are either dogmatic or uninteresting, depending on which interpretation we give to them.

The dogmatic element in Skinner's thinking is further revealed when he states that "the task of a scientific analysis is to explain how the behavior of a person as a physical system is related to the conditions under which the human species evolved and the conditions under which the individual lives" (p. 14). Surely the task of a scientific analysis is to discover the facts and explain them. Suppose that in fact the human brain operates by physical principles (perhaps now unknown) that provide for free choice, appropriate to situations but only marginally affected by environmental contingencies. The task of scientific analysis is not — as Skinner believes — to demonstrate that the conditions to which he restricts his attention fully determine human behavior, but rather to discover whether in fact they do (or whether they are at all significant), a very different matter. If they do not, as seems plausible, the "task of a scientific analysis" will be to clarify the issues and discover an

intelligible explanatory theory that will deal with the actual facts. Surely no scientist would follow Skinner in insisting on the a priori necessity that scientific investigation will lead to a particular conclusion, specified in advance.

In support of his belief that science will demonstrate that behavior is entirely a function of antecedent events, Skinner notes that physics advanced only when it "stopped personifying things" and attributing to them "wills, impulses, feelings, purposes," and so on (p. 8). Therefore, he concludes, the science of behavior will progress only when it stops personifying people and avoids reference to "internal states." No doubt physics advanced by rejecting the view that a rock's wish to fall is a factor in its "behavior," because in fact a rock has no such wish. For Skinner's argument to have any force, he must show that people have wills, impulses, feelings, purposes, and the like no more than rocks do. If people do differ from rocks in this respect, then a science of human behavior will have to take account of this fact.

Similarly, Skinner is correct in asserting that "modern physics or most of biology" does not discuss such matters as "a crisis of belief" or "loss of confidence" (p. 10). Evidently, from this correct observation nothing follows about the science of human behavior. Physics and biology, Skinner observes, "did not advance by looking more closely at the jubilance of a falling body, or…the nature of vital spirits, and we do not need to try to discover what personalities, states of mind, feelings, traits of character, plans, purposes, intentions, or the other perquisites of autonomous man really are in order to get on with a scientific analysis of behavior"; and we must neglect "supposed mediating states of mind" (p. 15).

This is true enough, if indeed there are no mediating states that can be characterized by an abstract theory of mind, and if personalities, etc., are no more real than the jubilance of a falling body. But if the factual assumptions are false, then we certainly do need to try to discover what the "perquisites of autonomous man" really are. Skinner might argue, more rationally, that his "science" does

But this gives the game away. We are now using "reinforce" in a sense quite different from that of the laboratory theory of behavior. It would make no sense at all to try to apply results about "scheduling" of reinforcement, for example, to this situation. Furthermore, it is no wonder that we can "explain" behavior by using the nontechnical term "reinforce" with just the meaning of "like" or "enjoy" or "learn something from" or whatever. Similarly, when Skinner tells us that a fascinating hobby is "reinforcing" (p. 36), he is surely not claiming that the behavior that leads to indulging in this hobby will be increased in probability. Rather, he means that we enjoy the hobby. A literal interpretation of such remarks yields gibberish, and a metaphorical interpretation merely replaces an ordinary term by a homonym of a technical term, with no gain in precision.

In fact, Skinnerian translation, which is easily employed by anyone, leads to a significant loss of precision, for the simple reason that the full range of terms for the description and evaluation of behavior, attitude, opinion, and so on, must be "translated" into the impoverished system of terminology borrowed from the laboratory (and deprived of its meaning in transition). It is hardly surprising, then, that Skinner's translations generally miss the point, even with the metaphorical use of such terms as "reinforce." Thus Skinner asserts that "a person wants something if he acts to get it when the occasion arises" (p. 37). It follows that it is impossible to act to get something, given the opportunity, without wanting it — say, to act thoughtlessly, or out of a sense of duty (we can, as usual, reduce Skinner's assertion to triviality by saying that what the person wants is to do his duty, and so on). It is clear from the context that Skinner means "if" as "if and only if." Thus it follows from his definition of "want" that a person cannot want something without acting to get it when the occasion arises, say for reasons of conscience (again, we can escape to triviality by assigning such reasons to the "occasion").

Since persuasion cannot be coherently described as the result of arrangement of reinforcers, it follows that behavior is not entirely determined by the specific contingencies to which Skinner arbitrarily restricts his attention, and that the major thesis of the book is false. Skinner can escape this conclusion only by claiming that persuasion is a matter of arranging reinforcing stimuli, but this claim is tenable only if the term "reinforcement" is deprived of its technical meaning and used as a mere substitute for the detailed and specific terminology of ordinary language. In any event, Skinner's "science of behavior" is irrelevant: the thesis of the book is either false (if we use terminology in its technical sense) or empty (if we do not). And the argument against the libertarian collapses entirely.

Not only is Skinner unable to uphold his claim that persuasion is a form of control, but he also offers not a particle of evidence to support his claim that the use of "weak methods of control" simply shifts the mode of control to some obscure environmental factor rather than to the mind of autonomous man. Of course, from the thesis that all behavior is controlled by the environment, it follows that reliance on weak rather than strong controls shifts control to other aspects of the environment. But the thesis, in so far as it is at all clear, is without empirical support, and in fact may even be empty, as we have seen in discussing "probability of response" and persuasion. Skinner is left with no coherent criticism of the "literature of freedom and dignity."

The emptiness of Skinner's system is revealed when he discusses more peripheral matters. He claims (p. 112) that the statement "You should (you ought to) read David Copperfield" may be translated, "You will be reinforced if you read David Copperfield." No matter how we try to interpret Skinner's suggestion, giving the term "reinforce" its literal sense, we fall into utter confusion. Probably what Skinner has in mind when he says that it is "reinforcing" to read David Copperfield is that the reader will like it or enjoy it, and thus be "reinforced."

not overlook these "perquisites," but rather accounts in other ways for the phenomena discussed in these terms. We shall see directly what substance there is to such a claim.

It is hardly possible to argue that science has advanced only by repudiating hypotheses concerning "internal states." By rejecting the study of postulated inner states Skinner reveals his hostility not only to "the nature of scientific inquiry" but even to common engineering practice. For example, Skinner believes that "information theory" ran into a "problem when an inner 'processor' had to be invented to convert input into output" (p. 18).

This is a strange way of describing the matter. Suppose that an engineer is presented with a device whose functioning he does not understand, and suppose that through experiment he can obtain information about input-output relations of this device. He would not hesitate, if rational, to construct a theory of the internal states of the device and to test it against further evidence. He might also go on to try to determine the mechanisms that function in the ways described by his theory of internal states, and the physical principles at work — leaving open the possibility that new and unknown physical principles might be involved, a particularly important matter in the study of behavior of organisms. His theory of internal states might well be the only useful guide to further research. By objecting, a priori, to this research strategy, Skinner merely condemns his strange variety of "behavioral science" to continued ineptitude.

We cannot specify, a priori, what postulates and hypotheses are legitimate. Skinner's a priorism in this regard is no more legitimate than the claim that classical physics is not "science" because it appeals to the "occult force of gravity." If a concept or principle finds its place in an explanatory theory, it cannot be excluded on methodological grounds, as Skinner continually insists. In general, Skinner's conception of science is very odd. Not only do his a priori methodological assumptions rule out all but the most trivial scientific theories; he is, furthermore, given to strange pronouncements

such as the assertion that "the laws of science are descriptions of contingencies of reinforcement" (p. 189) — which I happily leave to others to decode.

It is important to bear in mind that Skinner's strictures do not define the practice of behavioral science. In fact, those who call themselves "behavioral scientists" or even "behaviorists" vary widely in the kinds of theoretical constructions that they are willing to admit. W. V. O. Quine, who on other occasions has attempted to work within Skinner's framework, goes so far as to define "behaviorism" simply as the insistence that conjectures and conclusions must eventually be verified by observations.[3] As he points out, any reasonable person is a "behaviorist" in this sense. Quine's proposal signifies the demise of behaviorism as a substantive point of view, which is just as well. Whatever function "behaviorism" may have served in the past, it has become nothing more than a set of arbitrary restrictions on "legitimate" theory construction, and there is no reason why someone who investigates man and society should accept the kind of intellectual shackles that physical scientists would surely not tolerate and that condemn any intellectual pursuit to insignificance.

Let us consider more carefully what Skinner means when he asserts that all behavior is externally controlled and that behavior is a function of genetic and environmental conditions. Does he mean that full knowledge of such conditions would permit, in principle, specific predictions as to what a person will do? Surely not. Skinner means that genetic and environmental conditions determine "probability of response." But he is so vague about this notion that it is unclear whether his claims about determinism amount to anything at all.

No one would doubt that the likelihood of my going to the beach depends on the temperature, or that the likelihood of my produc-

[3] "Linguistics and philosophy," in S. Hook (ed.), Language and Philosophy, (New York University, 1969), p. 97.

predictable from the start, from an analysis of the problems and the means proposed to deal with them.

It must be stressed that "verbal behavior" is the only aspect of human behavior that Skinner has attempted to investigate in any detail. To his credit, he recognized early that only through a successful analysis of language could he hope to deal with human behavior. By comparing the results that have been achieved in this period with the claims that are still advanced, we gain a good insight into the nature of Skinner's science of behavior. My impression is, in fact, that the claims are becoming more extreme and more strident as the inability to support them and the reasons for this failure become increasingly obvious.

It is unnecessary to labor the point any further. Evidently Skinner has no way of dealing with the factors involved in persuading someone or changing his mind. The attempt to invoke "reinforcement" merely leads to incoherence. The point is crucial. Skinner's discussion of persuasion and "changing minds" is one of the few instances in which he tries to come to terms with what he calls the "literature of freedom and dignity." The libertarian whom he condemns distinguishes between persuasion and certain forms of control. He advocates persuasion and objects to coercion. In response, Skinner claims that persuasion is itself a (weak) form of control and that by using weak methods of control we simply shift control to other environmental conditions, not to the person himself (pp. 97 and 99).

Thus, Skinner claims, the advocate of freedom and dignity is deluding himself in his belief that persuasion leaves the matter of choice to "autonomous man," and furthermore he poses a danger to society because he stands in the way of more effective controls. As we see, however, Skinner's argument against the "literature of freedom and dignity" is without force. Persuasion is no form of control at all, in Skinner's sense; in fact, he is unable to deal with the concept. But there is little doubt that persuasion can "change minds" and affect behavior, on occasion quite effectively.

torture, I force someone to say, repeatedly, that the earth stands still, then I have changed his opinion. Comment is unnecessary.

Skinner claims that persuasion is a weak method of control, and he asserts that "changing a mind is condoned by the defenders of freedom and dignity because it is an ineffective way of changing behavior, and the changer of minds can therefore escape from the charge that he is controlling people" (p. 97). Suppose that your doctor gives you a very persuasive argument to the effect that if you continue to smoke, you will die a horrible death from lung cancer. Is it necessarily the case that this argument will be less effective in modifying your behavior than any arrangement of true reinforcers?

In fact, whether persuasion is effective or not depends on the content of the argument (for a rational person), a factor that Skinner cannot begin to describe. The problem becomes still worse if we consider other forms of "changing minds." Suppose that a description of a napalm raid on a foreign village induces someone in an American audience to carry out an act of sabotage. In this case, the "effective stimulus" is not a reinforcer, but the mode of changing behavior may be quite effective, and, furthermore, the act that is performed (the behavior "reinforced") is entirely new (not in the "repertoire") and may not even have been hinted at in the "stimulus" that induced the change of behavior. In every possible respect, then, Skinner's account is simply incoherent.

Since his William James Lectures of 1947,[6] Skinner has been sparring with these and related problems. The results are nil. It remains impossible for Skinner to formulate questions of the kind just raised in his own terms, let alone investigate them. What is more, no serious scientific hypotheses with supporting evidence have been produced to substantiate the extravagant claims to which he is addicted. Furthermore, this record of failure was

[6] See his Verbal Behavior (Appleton-Century-Crofts, 1957), which incorporates and extends these lectures.

ing a sentence of English rather than Chinese is "determined" by my past experience, or that the likelihood of my producing a sentence of a human language rather than of some imaginable but humanly inaccessible system is "determined" by my genetic constitution. We hardly need behavioral science to tell us this. When we look for more specific predictions, however, we find virtually nothing. Worse, we discover that Skinner's a priori limitations on "scientific" inquiry make it impossible for him even to formulate the relevant concepts, let alone investigate them.

Consider, for example, the notion, "likelihood of my producing a sentence of English rather than Chinese." Given a characterization of "English" and "Chinese" by an abstract theory of postulated internal states (mental states, if you like), one can give some meaning to this notion — though the probabilities, being negligible under any known characterization of determining factors, will be of no interest for the prediction of behavior. But for Skinner, even this marginal achievement is impossible. For Skinner, what we call "knowledge of French" is a "repertoire acquired as a person learns to speak French" (p. 197). Therefore probabilities of speaking French or other languages will be defined by referring to such "repertoires."

But what does it mean to say that some sentence of English that I have never heard or produced belongs to my "repertoire," but not any sentence of Chinese (so that the former has a higher "probability")? Skinnerians, at this point in the discussion, appeal to "similarity" or "generalization," but always without characterizing precisely the ways in which a new sentence is "similar" to familiar examples or "generalized" from them. The reason for this failure is simple. So far as is known, the relevant properties can be expressed only by the use of abstract theories (for example, a grammar) describing postulated internal states of the organism, and such theories are excluded, a priori, from Skinner's "science." The immediate consequence is that the Skinnerian must lapse into mysticism (unexplained "similarities" and "generalization" of a sort that cannot

be specified) as soon as the discussion touches the world of fact. While the situation is perhaps clearer in the case of language, there is no reason to suppose that other aspects of human behavior will fall within the grasp of the "science" constrained by a priori Skinnerian restrictions.

Skinner's response to criticism about such matters is illuminating. He believes that people attack him and argue against his "scientific picture of man" because "the scientific formulation has destroyed accustomed reinforcers" and causes "behavior previously reinforced by credit or admiration [to] undergo extinction," since "a person can no longer take credit or be admired for what he does." And extinction, he asserts, "often leads to aggressive attack" (p. 212). Elsewhere, he accuses his critics of "emotional instability," citing comments of Arthur Koestler and Peter Gay to the effect that behaviorism is "a monumental triviality" marked by "innate na•vetŽ" and "intellectual bankruptcy" (p. 165). Skinner does not attempt to meet this criticism by presenting some relevant results that are not a monumental triviality. He is unable to perceive that objection to his "scientific picture of man" derives not from "extinction" of certain behavior or opposition to science, but from an ability to distinguish science from triviality and obvious error.

Skinner does not comprehend the basic criticism: when his formulations are interpreted literally, they are clearly false, and when these assertions are interpreted in his characteristic vague and metaphorical way, they are merely a poor substitute for ordinary usage. Such criticisms cannot be overcome by verbal magic, that is, by mere reiteration that his approach is scientific and that those who do not see this are opposed to science, or deranged. Similarly, Skinner claims that Koestler's characterization of behaviorism is seventy years out of date, but does not indicate what great achievements of the past seventy years Koestler has neglected. In fact, the achievements of behavioral science that are not trivial, so far as we know, have no bearing on the problems that Skinner discusses.

Suppose Skinner were to claim that his book might persuade us by pointing to positive consequences of behavioral technology. But this will not do at all. It is not enough for him to point to those consequences (e.g., to draw pictures of happy people); rather he must show that these are indeed consequences of the recommended behavior. To persuade us, he must establish a connection between the recommended behavior and the pleasant situation he describes. The question is begged by use of the term "consequences."[5] It is not enough merely to conjoin a description of the desired behavior and a description of the "reinforcing" state of affairs (we overlook, again, that not even these notions are expressible in Skinner's terms). Were that sufficient for "persuasion," then we could "persuade" someone of the opposite by merely conjoining a description of an unpleasant state of affairs with a description of the behavior that Skinner hopes to produce.

If persuasion were merely a matter of pointing to reinforcing stimuli and the like, then any persuasive argument would retain its force if its steps were randomly interchanged, or if some of its steps were replaced by arbitrary descriptions of reinforcing stimuli. Of course, this is nonsense. For an argument to be persuasive, at least to a rational person, it must be coherent; its conclusions must follow from its premises. But these notions are entirely beyond the scope of Skinner's science. When he states that "deriving new reasons from old, the process of deduction" merely "depends upon a much longer verbal history" (p. 96), he is indulging in hand-waving of a most pathetic sort.

Consider Skinner's claim that "we sample and change verbal behavior, not opinions," as, he says, behavioral analysis reveals (p. 95). Taken literally, this means that if, under a credible threat of

[5] As Koestler points out, in remarks Skinner quotes, Skinner's approach represents "question-begging on a heroic scale" (p. 165). It will not do to respond, as Skinner does, by claiming that this is "name-calling" and a sign of emotional instability. Rather it will be necessary to show that this is not the literal and obvious truth (as indeed it is).

thesis is true, then reading or writing the book would appear to be an entire waste of time, since it reinforces no behavior.

Skinner would surely argue that reading the book, or perhaps the book itself, is a "reinforcer" in some other sense. He wants us to be persuaded by the book, and, not to our surprise, he refers to persuasion as a form of behavioral control, albeit a weak and ineffective form. Skinner hopes to persuade us to allow greater scope to the behavioral technologists, and apparently believes that reading this book will increase the probability of our behaving in such a way as to permit them greater scope (freedom?). Thus reading the book, he might claim, reinforces this behavior. It will change our behavior with respect to the science of behavior (p. 24).

Let us overlook the problem, insuperable in his terms, of clarifying the notion of "behavior that gives greater scope to behavioral technologists," and consider the claim that reading the book might reinforce such behavior. Unfortunately, the claim is clearly false, if we use the term "reinforce" with anything like its technical meaning. Recall that reading the book reinforces the desired behavior only if it is a consequence of the behavior. Obviously putting our fate in the hands of behavioral technologists is not behavior that led to (and hence can be reinforced by) our reading Skinner's book. Therefore the claim can be true only if we deprive the term "reinforce" of its technical meaning. Combining these observations, we see that there can be some point to reading the book or to Skinner's having written it only if the thesis of the book is divorced from the "science of behavior" on which it allegedly rests.

Let us consider further the matter of "persuasion." According to Skinner, we persuade ("change minds") "by manipulating environmental contingencies," specifically, "by pointing to stimuli associated with positive consequences" and "making a situation more favorable for action, as by describing likely reinforcing consequences" (p. 91f.). Even if we overlook the fact that persuasion, so characterized, is a form of control (a variety of "reinforcement") unknown to Skinner's science, his argument is in no way advanced.

It is for this reason that Skinner assures the reader that he has no "need to know the details of a scientific analysis of behavior" (p. 22), none of which is presented. It is not the depth or complexity of this theory that prevents Skinner from outlining it for the lay reader. For example, Jacques Monod, in his recent work on biology and human affairs,[4] gives a rather detailed presentation of achievements of modern biology that he believes to be relevant to his (clearly identified) speculations. I should add, to make myself clear, that I am not criticizing Skinner for the lack of significant achievement in the behavioral sciences as compared, say, to biology, but rather for his irresponsible claims regarding the "science of behavior," which Skinner does not bother to tell the reader about but which has allegedly produced all sorts of remarkable results concerning the control of behavior.

If a physical scientist were to assure us that we need not concern ourselves over the world's sources of energy because he has demonstrated in his laboratory that windmills will surely suffice for all future human needs, he would be expected to produce some evidence, or other scientists would expose this pernicious nonsense. The situation is different in the behavioral sciences. A person who claims that he has a behavioral technology that will solve the world's problems and a science of behavior that both supports it and reveals the factors determining human behavior is required to demonstrate nothing. One waits in vain for psychologists to make clear to the general public the actual limits of what is known. In view of the prestige of science and technology, this is an unfortunate situation.

II

Let us now turn to the evidence that Skinner provides for his extraordinary claims: e.g., that "an analysis of behavior" reveals that the achievements of artists, writers, statesmen, and scientists can

[4] Jacques Monod, Chance and Necessity (knopf, 1971).

be explained almost entirely according to environmental contingencies (p. 44); that it is the environment that makes a person wise or compassionate (p. 171); that "all these questions about purposes, feelings, knowledge, and so on, can be restated in terms of the environment to which a person has been exposed" and that "what a person 'intends to do' depends on what he has done in the past and what has then happened" (p. 72); and so on.

According to Skinner, apart from genetic endowment, behavior is determined entirely by "reinforcement." To a hungry organism, food is a positive reinforcer. This means that "anything the organism does that is followed by the receipt of food is more likely to be done again whenever the organism is hungry" (p. 27); but "Food is reinforcing only in a state of deprivation" (p. 37). A negative reinforcer is a stimulus that increases the probability of behavior that reduces the intensity of that stimulus; it is "aversive," and, roughly speaking, constitutes a threat (p. 27). A stimulus can become a conditioned reinforcer by association with other reinforcers. Thus money is "reinforcing only after it has been exchanged for reinforcing things" (p. 33). The same is generally true of approval and affection. (The reader may attempt something that Skinner always avoids, namely, to characterize the "stimuli" that constitute "approval.")

Behavior is shaped and maintained by the arrangement of such reinforcers. Thus, "We change the relative strengths of responses by differential reinforcement of alternative courses of action" (pp. 94–95). One's repertoire of behavior is determined by "the contingencies of reinforcement to which he is exposed as an individual" (p. 127). An "organism will range between vigorous activity and complete quiescence depending upon the schedules on which it has been reinforced" (p. 186). As Skinner realizes (though some of his defenders do not), meticulous control is necessary to shape behavior in highly specific ways. Thus, "The culture…teaches a person to make fine discriminations by making differential reinforcement more precise" (p. 194), a fact that causes problems when "the verbal community cannot arrange the subtle contingencies necessary to teach fine distinctions among stimuli which are inaccessible to it." "As a result the language of emotion is not precise" (p. 106).

The problem in "design of a culture" is to "make the social environment as free as possible of aversive stimuli" (p. 42), "to make life less punishing and in doing so to release for more reinforcing activities the time and energy consumed in the avoidance of punishment" (p. 81). It is an engineering problem, and we could get on with it if only we could overcome the irrational concern for freedom and dignity. What we require is the more effective use of the available technology, more and better controls. In fact, "A technology of behavior is available which would more successfully reduce the aversive consequences of behavior, proximate or deferred, and maximize the achievements of which the human organism is capable" (p. 125). But "the defenders of freedom oppose its use," thus contributing to social malaise and human suffering. It is this irrationality that Skinner hopes to persuade us to overcome.

At this point an annoying, though obvious, question intrudes. If Skinner's thesis is false, then there is no point in his having written the book or our reading it. But if his thesis is true, then there is also no point in his having written the book or our reading it. For the only point could be to modify behavior, and behavior, according to the thesis, is entirely controlled by arrangement of reinforcers. Therefore reading the book can modify behavior only if it is a reinforcer, that is, if reading the book will increase the probability of the behavior that led to reading the book (assuming an appropriate state of deprivation). At this point, we seem to be reduced to gibberish.

A counterargument might be made that even if the thesis is false, there is a point to writing and reading the book, since certain false theses are illuminating and provocative. But this escape is hardly available. In this case, the thesis is elementary and not of much interest in itself. Its only value lies in its possible truth. But if the