

DISCUSSION

IS TO ABANDON DETERMINISM TO WITHDRAW FROM THE ENTERPRISE OF SCIENCE?

Professor Ernest Nagel has made two very general and very important philosophical claims, both of which seem to me mistaken.¹ I shall call them (A) and (B) respectively.

- (A) The deterministic principle is not an “empirical generalization about the pervasive structure of the world” but a regulative or guiding principle, a directive, “instructing us to search for explanations possessing certain broadly delimited features...” (See page 322 in *The Structure of Science* and page 317 of “Determinism in History.” Hereafter referred to as SS and DH respectively.)
- (B) “To abandon the deterministic principle, is to withdraw from the enterprise of science” (SS, p. 606 and DH, p. 317).

Let us consider (A) first. I do not see how determinism’s “operative role” can be that of a guiding or regulative principle without determinism’s becoming something very different from what it purports to be. But to get beyond the stage of claim and counter-claim, I must first state how Nagel characterizes determinism. Nagel talks about determinism in terms of deterministic systems. We can say, Nagel contends, that any system, as a whole, is a deterministic one when for any state that the system is in at any given time “the necessary and sufficient condition for the occurrence of that state at that time is that the system was in a certain state at a certain previous time.” (DH, p. 294) In such a deterministic system if a variable of the system has a certain value at a given time there must be some definite state at some prior time that is the necessary and sufficient condition for that variable’s having

¹ See his “Determinism in History,” *Philosophy and Phenomenological Research*, vol. XX No. 3 (March, 1960), pp. 296-7 and 316-7, and his *The Structure of Science* (New York: 1961), pp. 278-85, 316-24, and 605-6.

that value. This is true for every value of every variable in the system. If this is also true for all the values of all the variables of all the systems in the universe and there is nothing that is not included within these systems, then determinism is true.

Utilizing the description given above, we can characterize the general claim of determinism as the claim that "for every set of characteristics which may occur at any time, there is some system that is deterministic in respect to those occurrences." (DH, p. 296) People with a similar intent have variously stated determinism as follows:

- (1) Every event has a cause.
- (2) For any event E, there is *some* set of antecedent conditions such that, whenever these conditions obtain, an event of kind E occurs.
- (3) For every set of characteristics which may occur at any time, there is some state of affairs that is necessary and sufficient for its occurrence.
- (4) For any state of any system at some initial time, some explanatory theory could be constructed which would logically establish a unique state for the system for any other time.

(1), (2), (3) and (4) are variant — more or less vague — statements of the deterministic thesis, but none of these statements appears to be a guiding principle or regulative principle. Taken at face value, at least, they certainly do not appear to be general directives or injunctions to search for causes or seek explanations. They do not seem to be telling us or instructing us to do or look for anything. 'There may be some events that do not have causes but always look for causes anyway' is not a self-contradiction. It is not even what Nowell-Smith would call logically odd. In making deterministic statements we use declarative sentences. What evidence do we have for saying that such utterances in reality function as disguised imperatives or quasi-imperatives, directing us, as scientists or men with a scientific attitude, to look for causes? And, are we on any sounder ground if we try to make out that in reality they are maxims or directives directing us to "construct theories and find appropriate systems to which those theories can be successfully applied," which, "when the state of a system is given for some initial time . . . , the theory for it must determine a unique state of the system for any other time?" (SS, p. 320) One familiar ground for urging people always to look for causes is the belief that all events have causes. One reason for telling people always to look for such systems is the belief that such systems are "a categorical feature of everything whatsoever." (SS, p. 605) But, if this is so, the ground for making the plea or directive

to look for causes and such systems can hardly be identical in meaning with the plea or directive itself. As G. J. Warnock has pointed out, "it is still the natural view to take" that in urging people to look for causes we are claiming that "if they persist success will be achieved."² Since this is so, it is surely incorrect to say that 'Every event has a cause' *really means* or in effect means 'Always look for causes.' (Incorrect, unless one wants to get tricky with '*really means*.' Then the view becomes paradoxical. Whichever maneuver is adopted, here once again — as is so usual in philosophy — "language has gone on a holiday.")

(1), (2), (3) and (4) are indeed odd. Their factual status, as Professor Nagel rightly points out, is — to put it mildly — equivocal and they are not analytic statements. But to claim that they are not really law-like statements at all but are in reality general and important directives, is not to analyze what they mean but to *stipulate a new use* for these sentences, to free them from philosophical difficulties. (Nagel's treatment of determinism here is parallel to Braithwaite's and Hare's stipulations about the meaning of religious utterances.) It seems to me far more reasonable to say, as Warnock does, that they are vacuous (though still nonanalytic) statements.³ While the sentences used to assert these statements have the grammatical form of sentences that are used to make plain factual statements, statements made from them, like statements made from 'Every substance has some solvent,' or 'Somewhere in the universe there is a green-haired bar maid,' are so near to being vacuous as to be pointless, though it is not correct to assert that they are totally devoid of meaning.⁴ (Since intelligibility admits of degrees, it is rather pointless — though sometimes bracing — to say that so and so is either meaningless or meaningful, period.) Such deterministic claims obtrude into philosophical and some metascientific discussions but they literally do no work in science and everyday life.

It is now time to consider (B). Nagel would thoroughly object to these last remarks of mine, for as puzzling as the logical status of determinism is, it remains the case — according to Nagel — that "to abandon the deterministic principle itself, is to withdraw from the enterprise of science." (DH, p. 317 and SS, p. 606) This seems to me to be completely contrary to the truth. It seems to me that the so-called law of causation or the deterministic principle is not a law in any of the sciences, a postulate assumed by all or even some of the sciences, or a

² G. J. Warnock, "Every Event Has a Cause," *Logic and Language* (Second Series), A. Flew (ed.) pp. 96-7.

³ *Ibid.*, pp. 97, 107, 110.

⁴ *Ibid.*, pp. 97-107, 110.

regulative principle of the sciences. In doing science or in taking a scientific attitude toward things one need not accept either determinism or indeterminism. They are both metaphysical doctrines that add nothing to the structure of science.

It may be that to reason scientifically is to look for causes, to try to formulate coherent and comprehensive law-like statements that are capable of being tested. (This may be, as Nagel suggests, partially definitory of what it is to do science.⁵) But in *doing science* one need not assume that one must or even will always find a causal explanation for every occurrence or that everything can be explained. Such a deterministic belief may be a personal article of faith of the scientist, but it is not a kind of scientific credo; and it is not a part of any science or a necessary postulate of scientific thinking. In doing science we neither logically nor psychologically need this article of faith. It may be emotionally comforting for some, but it still remains from a scientific point of view metaphysical excess baggage.

Warnock has given a very plausible account of why people have come to think the law of causation or determinism is somehow a necessary part of science — a well-known account that Nagel completely overlooks.⁶ It is natural to feel that determinism says something “of the greatest importance” for it is very easy to confuse the law of causation, that is (1), (2), (3) or (4), with certain very important though uncontroversial factual statements. It is an important — though patently true — statement of fact that many people in our culture do search (frequently with striking success) for laws of nature or for the causes of events. It is a further and important cultural fact that we now rely less than we formerly did on prayers, spells or ritual performances and turn more to scientific explanations in our efforts to find out how the world goes. That people do this is an important fact and if, as Spengler prophesies they will, they stop doing this or slack in their efforts, they should be urged not to do so, for to fix belief in this scientific way is, as Pierce and Dewey stressed, a very good thing. But this fact about the incidence of the use of scientific explanations has nothing to do with determinism.

It is another important and again obvious truth of a perfectly factual sort, that those “who seek to formulate statements of law meet with considerable and, on the whole with constantly increasing, success.”⁷ Yet, to say that for every event there are some conditions sufficient for

⁵ Though, as Toulmin shows, science is a many-splendored thing. See Stephen Toulmin, *Foresight and Understanding: An Enquiry into the Aims of Science*, (London: 1961).

⁶ Warnock, *op. cit.*, pp. 109-110.

⁷ *Ibid.*, p. 109.

the occurrence of that event, is clearly not to say that people often succeed in discovering them, nor is it to say that none will constantly elude discovery. Nagel himself has stressed this. But in this connection he fails to see its import.

A further point needs to be made in this connection. A scientist need not believe that every event has a cause, that there must be a reason for everything or that all that seems inexplicable will one day be explained.⁸ Such beliefs may be heuristically valuable for some scientific inquirers, but the crucial point here is that statements asserting these beliefs are not a part of the language of science nor need they be assumed for the enterprise of science to continue. They do not follow from 'Always look for causes' or any other directive. It may be that to do science a scientist must look for causes, but in order to do that he need not assume the truth of determinism. He need not assume (1) or some more sophisticated form of determinism like (3) or (4). From 'Every event has a cause' or from (2), (3) or (4), we cannot derive: a) 'What seems inexplicable will one day be explained,' b) 'In more and more areas we have gained good causal explanations of events,' or c) 'We will continue to succeed in making good scientific explanations of events including human actions.' We must note that (a), (b) and (c) are all logically independent of (1), (2), (3), (4) and any other intelligible statement of the thesis of determinism.

Finally, 'Every event has a cause,' like (2), (3) and (4) is close to vacuity. Science does not and cannot rest on such formulae. Historically speaking, belief in determinism *may* have been an important stimulant to scientific inquiry, but we have no reason to believe that to abandon determinism is to abandon the enterprise of science.

KAI NIELSEN.

NEW YORK UNIVERSITY.

⁸ On this point see Arthur C. Danto, "Faith, Language and Religious Experience: A Dialogue" in *Religious Experience and Truth*, Sidney Hook ed. (New York: 1961), p. 140.