

AVERROES AND THE CASE OF THE FIERY FURNACE

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1

Much of what Averroes had to say about the concepts of causality and nonlogical necessity seem to me both intrinsically important and part of a great tradition. Yet his philosophical ability and significance has never been adequately appreciated. Like al-Ghazālī, he has been the object of much scholarship, and his historical influence on Christian philosophical thought and Western scientific thought has been well documented. But unlike al-Ghazālī and for complicated reasons, he has never been fully appreciated by either the Islamic or Christian tradition.¹ This fact is unfortunate if I am right in thinking that his view has the potential for development in a direction which, had it been persistently pursued, would have both adequately answered al-Ghazālī's critique of causality and would have vitiated Hume's analysis in advance. This paper is not intended to be a contribution to the scholarly literature on Averroes, though, of course, I will attempt historical accuracy; but it is an effort to take Averroes seriously as a guide in discussing philosophical issues that are crucial at all times and are left unmoved by passing philosophical fashions and fads.

My way of going will be as follows: 1) to present the Fiery Furnace episode as a paradigm case of a miracle in order to clarify and systematize the radically different attitudes Islamic philosophers and theologians have taken toward the concepts of causality and nonlogical necessity; 2) to state the generally accepted interpretations of the

views of the Ash'arites, al-Ghazālī, and Averroes, and to note certain problems of interpretation; 3) to explain the most important Ash'arite criticisms of causality; and, most importantly, 4) to state, elaborate, extend, and defend Averroes' position.

2

The fiery furnace episode is a favorite among Islamic philosophers. If a man falls into a fiery furnace, is it necessary that he be incinerated? It would seem so, on the face of it, given the nature of fire and human flesh and bones, unless he got out before being badly burnt or had on an asbestos suit. However a prophet falls into a fire, does not get out, does not have on talc or an asbestos suit, but still is not incinerated. How is this miracle possible? Islamic philosophers responded in various ways.

i) It *is not* possible; such miracles do not occur and references to them must be interpreted metaphorically. Al-Ghazālī ascribed this view to "the philosophers" (primarily Avicenna) whom he was criticizing in *The Incoherence of the Philosophers*. According to al-Ghazālī,

... they deny that Abraham could fall into the fire and not be burned notwithstanding the fact that the fire remained fire, and they affirm that this could only be possible through abstracting the warmth from the fire (through which it would, however, cease to be fire) or through changing the essence of Abraham and making him a stone or something on which fire has no influence, and neither the one nor the other is possible.²

ii) It *is* possible; such miracles literally happened and must not be interpreted metaphorically. To understand how they are possible one has to understand that there is no causality without agency, and that there are no natural agents—or human agents either perhaps—but only one Agent, God, who not only causally creates but also causally sustains all existence. The existence of physical bodies is a contingent matter, and these physical bodies are sustained in temporally finite spans of duration, and in temporally finite patterns of succession, by direct divine action. "Accordingly the orderly flow of these events has no inherent

necessity, being no more than a habit . . . decreed arbitrarily by the divine will. Hence when God creates a miracle, that is, when He disrupts the habitual course of nature, no contradiction obtains."³ This view is the accepted interpretation of the Ash'arites by Islamic scholars. There is, however, a qualification of this "occasionalistic" interpretation of Ash'arite doctrine that must be noted. This qualification was indicated by the "perhaps" in connection with human agency. It is usual to give an occasionalistic interpretation to Ash'arite views of human agency also, but other interpretations have also been given which allow the notion of human agency in certain respects.⁴

iii) It *is* possible; such miracles literally happened and need not be interpreted metaphorically. To understand how they are possible, however, one need not assume that God operates continuously as the only cause in the universe. One can reject the view that there are natural agents and nonlogical necessity without going to the extreme opposite view of occasionalism. God originally ordained that all the regularities found in the world would occur just as we find them. Given this original ordination, whenever A occurs, B also occurs without God's sustaining the relation each time. Miracles occur simply when God interdicts an ordination for a special purpose, again a procedure which involves no self-inconsistent claim (as "the philosophers" claimed). God, being omnipotent, is *able* to interdict constantly, and the logical possibility of complete instability of physical objects and their relations, used by philosophers as a *reductio* against occasionalistic views, must be admitted. But God does not do everything that he can do; such behavior would be inconsistent with various aspects of his revealed nature and will. God not only interdicts rarely and for good reason but also informs man of the fact when it occurs and why. This view has been ascribed to al-Ghazālī by a commentator who argues that al-Ghazālī is incorrectly interpreted as an occasionalist.⁵

iv) It *is not* possible; but this fact does not preclude the compatibility of the concepts of nonlogical necessity and the occurrence of miracles. If fire remains fire, and the prophet remains a man of flesh and bones and there are no

intervening conditions, then, indeed, the prophet must be incinerated. There are natural necessities which must produce their results, and to deny this fact is to get enmeshed in self-inconsistencies. There is a necessary connection between what a thing is and what it is able to do. To say that fire remains fire and is nevertheless unable to incinerate the flesh of a human being is to say that fire has certain characteristics which explain why it incinerates combustible materials and that flesh is combustible but nevertheless is not incinerated. This statement is a flat self-contradiction. However the existence of such natural necessities is not incompatible with the existence of miracles. It is perfectly possible that God, being omnipotent, could ring the fire with a fire-resisting sheath so that it did not incinerate the prophet, or that the prophet was rubbed with talc or wore an asbestos suit so that, again, he was not incinerated—but in either case conditions intervened so that the occasion for the exhibition of natural necessities were lacking and hence the ability of a particular to do *x* was not exemplified. But the fact that the conditions for the exemplification of the necessary connection between what a particular is and what it is able to do are lacking does not show that there is no necessary connection between them. Particulars have the power to do certain things even though they are not at the moment doing it. So natural necessities are perfectly compatible with miracles and those philosophers who denied this possibility (cf. i) are simply heretical as well as philosophically wrong.

Averroes held this position in his *The Incoherence of the Incoherence*,⁶ and he even thought that al-Ghazālī finally came to his senses and saw that the denial of “forms” leads to the reductio that there is no necessity in anything whatsoever, and that books may change capriciously into horses and soil the library floor, and so on. This consequence, as well as the impossibility of miracles, must be avoided. Averroes wrote:

When Ghazali saw that the theory that things have no particular qualities and forms from which particular acts follow, for everything is very objectionable, and contrary to common sense, he conceded this in his last section and

replaced it by the denial of two points: first that a thing can have these qualities but that they need not act on a thing in the way they usually act on it, e.g., fire can have its warmth but need not burn something that is brought near to it, even if it is usually burnt when fire is brought near to it. . . . The first point can be accepted by the philosophers, for because of external causes the procession of acts from agents may not be necessary, and it is not impossible that for instance fire may sometimes be brought near cotton without burning it, when something is placed with the cotton that makes it non-inflammable, as Ghazali says in his instance of talc and a living being.⁷

Van den Bergh concurs with Averroes' interpretation of al-Ghazālī, though he makes it clear, as presumably Averroes would want, that this interpretation of al-Ghazālī's position is not identical with that of Averroes'. Van den Bergh writes: “In this section Ghazali abandons the Ash'arite theory of the denial of causation, and reverts to the rationalistic supernaturalism of the Muslim philosophers (i.e., their attempt to justify supernatural facts by rational arguments, by theories, for example, of influences emanating from the soul or of a universal natural sympathy) which ultimately derives from Stoicism.”⁸ This interpretation seems to raise questions about the consistency of al-Ghazālī's view, since he presumably could not hold this view of form as well as his arguments *against* nonlogical necessity, which have led commentators variously to place him in either category (ii) or (iii).⁹

It might seem that Averroes is inconsistent at this point, for, as we have seen, he writes that al-Ghazālī's first point can be accepted by the philosophers, since “the procession of acts from agents may not be necessary” because of interposing conditions. Yet it is quite clear that this quoted phrase must not be construed as Averroes' rejection of a necessary connection between what a thing is and what it is able to do, and must do, given the appropriate conditions. We may assume that Averroes has expressed himself elliptically in this context. Presumably he does not mean that certain acts are not necessarily related to appropriate agents, in order for the concept of agency to make sense, but rather what he means is that certain acts which are

expected need not necessarily occur due to intervening agents.¹⁰ This notion is equivalent to saying that the conditions for the display of the necessary power of agent *a* to do *y* are not met.

3

If the positive doctrines of the Ash'arites in general and al-Ghazālī in particular are not wholly clear, their criticisms of the concept of nonlogical necessity are extremely clear and important. Their arguments are numerous, but only three fundamental ones will be considered along with Averroes' reply. I will concentrate on elaborating and defending Averroes' reply. The three arguments are the religious one from miracles, the metaphysical one from the independence of events, and the epistemic one from lack of evidence. We have already discussed the miracle argument and will now concentrate on the metaphysical and epistemic arguments.

ii) Causes and effects can be independently described; hence neither a cause implies that an effect will occur, nor an effect implies that a cause has occurred. But if there is no implication between (statements about) causes and effects, there can be no necessary connection between such events. Or, putting the matter another way, if there were a necessary connection between *C* and *E*, the assertion of *C* and not *E* would be self-inconsistent; but this assertion is not self-inconsistent, since *C* and *E* are independently describable. Hence there can be no necessary connection between *C* and *E*.

According to us [al-Ghazali] the connexion between what is usually believed to be a cause and what is believed to be an effect is not a necessary connexion; each of two things has its own individuality and is not the other, and neither the affirmation nor the negation, neither the existence nor the non-existence of the one is implied in the affirmation, negation, existence, and non-existence of the other—e.g., the satisfaction of thirst does not imply drinking, nor satiety eating, nor burning contact with fire . . . and so on for all the empirical connexions existing in medicine, astronomy, the sciences, and the crafts. . . . To investigate all these innumerable connexions would take us too long, and so we shall choose one single example, namely the burning of

cotton through contact with fire; for we regard it as possible that the contact might occur without the burning taking place, and also that the cotton might be changed into ashes without any contact with fire. . . .¹¹

ii) There are no empirical, or experiential, grounds for accepting the belief that *C*'s and *E*'s are necessarily related. What *do* we experience when we say that *a* is the cause of *b*? We simply experience as a matter of fact that *a* and *b* always occur together; we do not experience anything that shows *b* must follow from *a*. Returning to his example, al-Ghazālī asks what proof there is that fire is the agent, rather than God, in the burning of the cotton. "For fire is a dead body which has no action, and what is the proof that it is the agent? Indeed, the philosophers have no other proof than the observation of the occurrence of the burning, when there is contact with fire, but observation proves only a simultaneity, not a causation, and, in reality, there is no other cause but God."¹²

Except for a rigid positivist, the fact that we do not experience something is no good reason for believing that it does not exist. And since there are few rigid positivists anymore, al-Ghazālī's epistemic argument may seem unconvincing. However there is an argument implicit in his overall view which is impressive, and one which came to play a crucial role in subsequent discussions of the issues we are considering. The implicit argument is this: causal propositions are known to be true only empirically; whatever propositions are known to be true only empirically are contingent; hence causal propositions are contingent. And whatever is contingent is not necessary; hence causal propositions are not necessary. That this view is implicit in al-Ghazālī's thinking is suggested by the way the metaphysical and epistemic arguments seem to supplement each other. According to the former, as we have seen, *C* and *E* are independently describable and hence are existentially independent. Being independent their conjunction is contingent and hence presumably known only through experience. The epistemic argument is the converse: since causal statements are known only through experience, they must be contingent and hence not necessary. This argument, in

contemporary terminology, can be formulated in this fashion: 'x is contingent' and 'x is a posteriori', on the one hand, and 'x is necessary' and 'x is a priori', on the other, are materially equivalent; causal or scientific propositions are known to be true only a posteriori; hence they must be contingent and not necessary.¹³

4

Averroes' response to the metaphysical argument aims at showing that the event-independence world view leads to paradox, skepticism, and the denial of the possibility of any world at all. His main positive thrust is to show that there is a necessary connection between what a thing or particular is, on the one hand, and what it is able to do and undergo, on the other, and that to deny this relationship lands one in a self-inconsistent position. I want to give several quotations from Averroes' *The Incoherence of the Incoherence* to illustrate his response and his own positive doctrine, and then I will proceed to formulate what I take to be Averroes' timeless insights into contemporary examples and idioms, extend them, and defend them.

If a thing had not its specific nature, it would not have a special name nor a definition, and all things would be one—indeed, not even one; for it might be asked whether this one has one special act or one special passivity or not, and if it had a special act, then there would indeed exist special acts proceeding from special natures, but if it had no single special act, then the one would not be one. But if the nature of oneness is denied, the nature of being is denied, and the consequence of the denial of being is nothingness.¹⁴

Now intelligence is nothing but the perception of things with their causes, and in this it distinguishes itself from all the other faculties of apprehension, and he who denies causes must deny the intellect. Logic implies the existence of causes and effects, and knowledge of these effects can only be rendered perfect through knowledge of their causes. Denial of cause implies the denial of knowledge, and denial of knowledge implies that nothing in this world can be really known, and that what is supposed to be known is nothing but opinion, that neither proof nor definition exist, and that the essential attributes which compose definitions are void. The man who denies the necessity of any item of knowledge

must admit that even this, his own affirmation, is not necessary knowledge.¹⁵

Consider the following example of various types of particulars, their natures, and what they are able to do and have to undergo. The atmosphere is able to crush a container that has no air inside, the sea to crush a submarine that goes too deep, dynamite to explode when ignited, electric current to heat a resistance coil that is wired-in, and an avalanche to crush the houses in its path. Correspondingly the can with no air inside has the disposition to be crushed by the atmosphere, the submarine with a shell of a certain strength to be crushed by the deep water, the resistance coil to become hot with increased movement of molecules, and the houses to be crushed by the avalanche. There are, in short, both active and passive particulars in the world, though it is unlikely that any particular plays wholly one role. A landslide crushes the tractor that furrowed the earth. These ascriptions of abilities and disabilities are only causal promissory notes. They tell us that the natures of the particulars, the natures of which are as yet unstated, are such that the specific manifestations of abilities and disabilities must occur under the appropriate releasing conditions. Supplying the cause of such manifestations consists in specifying the nature of the particular involved, along with the appropriate releasing condition. Explaining the collapse of the can (E) consists in specifying that the atmosphere has weight and so exerts pressure and the equalizing air has been pumped out of the can (C). Explaining the heating up of the resistance coil (E) consists in specifying the molecular structure of the current and the fact that the resistance coil has been wired in (C). And so on for all the other examples. The general formula is this: N of p plus appropriate condition (x) constitute the cause while the particular manifestation of an ability or disability (y) constitutes the effect.¹⁶

Now the crucial question is, what sort of relationship holds between the nature of a particular and the abilities and disabilities this nature helps explain? Clearly it is not a contingent one in the sense that particulars could lose all their abilities and disabilities, or special sets of them, and

still be said to remain the same particular. A liquid that had a gasoline smell but would not explode under any conditions would not count as gasoline, since a host of inter-related concepts and explanations would break down. To claim that it remained gasoline, though it is unable to act in any way like gasoline, is to flatly contradict oneself. It is to say that a certain liquid both has and does not have nature N. The claim that atmospheric pressure failed to raise water in a pump, given the appropriate conditions, but nevertheless that air still has weight and the atmospheric blanket remains the same is simply self-inconsistent. To talk about the nature of the atmospheric blanket remaining the same, even though it loses the abilities and disabilities this nature helps to explain, is to assert and deny at once that it has nature N. In the case of the prophet, Averroes is saying, the notion that fire still remains fire even though the heat is gone is a good example of a fanciful sort of thinking that leads to the view that there are never any necessary relationships between the nature of a particular and its bundles of abilities and disabilities. But in truth a fire that had no heat is no fire at all, but simply another particular with a superficial resemblance—the sort of flickering red lights one sees in false fire logs. Fire has ceased to exist because the heat of fire is intimately bound up with other abilities and disabilities that modern scientific theory helps to explain, and to deny the heat while keeping the other properties plus the nature of fire that helps to explain them all is to land oneself in a straightforward self-inconsistency.

Averroes' reply to al-Ghazālī's event-independence argument can now be fully appreciated. According to al-Ghazālī's argument, there is no self-inconsistency in saying that the atmospheric pressure remains the same, there is a partial vacuum in the shaft of the pump, but nevertheless this time the N of p and x turn the water purple instead of pushing it up the pump. For Averroes this claim is not only self-inconsistent but it makes any ordinary or scientific knowledge or explanations impossible. If it is possible to have N of p plus x and not y, then it is not simply that old explanations have broken down but that there have never been

any explanations in the first place, and that in principle there could be no such explanations of why anything is what it is and does what it does and not something else. With the breakdown between what a particular is and what it is able to do, we would even be unable to distinguish one particular from another, and we would have a nulliverse instead of a universe.¹⁷

There are numerous objections to the type of view advocated by Averroes, but I am able here to consider only several of them. More detailed rebuttals of these criticisms will be found in my previous writings.

i) There seems to be an immediate problem with Averroes' view, since some individuals do gain or lose certain abilities or disabilities but do not thereby lose their identity—they still have the same nature. A drug may lose its effectiveness over a period of time, photographic paper will not make prints after a while, and a person may lose his ability to remember names; but the drug, paper, and person do not thereby lose their identities. This problem is only a *prima facie* one, however, since such changes in abilities and disabilities themselves occur in some theoretical ambit within which they are explained, and hence the overall theory provides an invariable characterization of x which continues constant throughout the changes while explaining them. Such theoretical structures presuppose what might be called the nature of some "fundamental particulars" which constitute the paradigmatic viewpoint of that scientific theory. The fundamental particulars are taken as unchanging in order to explain those particulars which keep their identity through change.

ii) The "nature" of a particular, it might be argued, is essentially a static characterization, clearly related to the outmoded concepts of natural kind and nominal essence. We know from biology that naturally occurring species do not exhibit the constancy required by the concept of natural kind. Classifications turn out to be divisions that reflect some convenience of notation. We are also told that it is impossible to separate essential and nonessential properties of the members of classes except on pragmatic grounds.

What properties we characterize as essential reflects some practical purpose.

However, as we see from the previous section, it is a misconception to suppose that the nature of a particular is a static characterization which must remain constant through time. Nothing could be further from the truth. At any given time the nature of a particular explains its abilities and disabilities, but the latter themselves may change. This change, in turn, is explained by reference to a corresponding change in the nature of the entity involved. It is true that the introduction of the concept of N of p entails the acceptance of a concept of natural kind, but it is false to suppose that the acceptance of the latter implies that classes must be constant. The biologist is claiming that there are no unchanging natural kinds, not that there are no natural kinds at all. For them natural kind refers to a group of individuals that have a cluster of characteristics in common at any given time, though these characters themselves are constantly changing. What really makes this collection a natural kind is that the members share a genetic, generative mechanism which, along with the nature of the environment, explains why the characters are held in common, and changes in which explain the changes in the ensemble of characters. Far from counting against a view like Averroes', this concept of natural kind, which is the biologist's concept of genotype, can only be clearly understood and justified within the framework of causal concepts we have been defending.

Finally it is a simple matter to reply to the criticism that the nature of a particular is equivalent to its nominal essence, and that it is impossible to separate properties into essential and nonessential ones except on practical grounds. Nominal essences are unchanging ensembles of properties that supposedly define a class. However, on the present view, the nature of a particular is not to be described in terms of unchanging properties and hence is not concerned with nominal essences except insofar as the properties by which we recognize a member of a species are held to follow from the real essences, or genetic make-up, of the individuals of that species. Natural kinds so

interpreted are not determined by properties at all, but by causal, generative mechanisms held in common by members of the class.

iii) It is often argued that concepts of nonlogical necessity remain metaphysically opaque. This criticism depends upon the mistaken notion that one who holds such a view conceives of 'cause' as an undefined descriptive predicate that refers to an ontological tie that binds objects and events together. However causal necessity is not a force or power that has some existence of its own but refers to *forceful objects at work*. There are not both things and causality in nature, but causally active as well as causally passive things. In Sterling Lamprecht's words,

Causality is a name for a certain quality of events; it is not a name for the agency behind the events. The agency is there, to be sure: it is the lava flow, the medicine, the light rays, the mechanic's muscles, the tossing waves. There is no other "force"; there is no other cause, than just these specific things. But these things are *forceful*; they operate; they produce.¹⁵

This point can be made quite vividly if we are willing to take the death of Charles I seriously. The executioner had a good eye, a strong arm, and a sharp ax, and he whacked off the king's head. Swinging the ax to make contact in just that way (necessarily) caused the king to lose his head. This necessity, however, was no ontological tie behind events that binds them together (could anything be further from the truth in this case?) It lay rather in the concrete situation, in the force used to swing the ax, in the sharpness of the ax, the angle of descent, and contact with a yielding substance. And so it always is. Causal necessity is nothing *in general*; it is precisely the relationships of necessity between what an object is and what it is able to do discovered by the experiments of science and the experience of daily life.

5

Averroes' response to al-Ghazālī's epistemic argument is not developed, as far as I know, though it is clear that he saw no difficulty in justifying statements about natural kinds on empirical grounds. The response depends upon

the Aristotelian distinction between knowledge of the fact and knowledge of the reasoned fact, or, as the distinction was eventually made by the Scholastics, a *ratio cognoscendi* and a *ratio essendi*.¹⁹ The former is the evidential ground for asserting that something is the case; the latter, the explanation of why something is what it is, and does what it does, rather than something else. The former are the empirical grounds for knowing the latter; the latter explain the former. That stars flicker is the ground for saying that they are quite distant from the earth; their great distance, in turn, explains why they flicker. That the moon waxes the way it does is the ground for saying that it is spherical; that it is spherical explains its way of waxing. These empirical evidence-hypotheses relationships, however, are perfectly compatible with interpreting the relations between great distance and flickering appearance, and sphericity and way of waxing, as noncontingent ones.

Al-Ghazālī's epistemic argument, it will be recalled, implicitly contains a strong criticism of natural necessity, one that depends upon the assumption that 'x is contingent' and 'x is a posteriori', on the one hand, and 'x is necessary' and 'x is a priori', on the other, are materially equivalent. That Averroes had no explicit reply to an implicit argument certainly should not come as a surprise. It seems to me, however, that a reply is implicit in the traditional distinction between a *ratio cognoscendi* and a *ratio essendi*, and that when made explicit constitutes a further defense of Averroes' view of nonlogical necessity.

The essence of the reply is to undermine the alleged material equivalencies between 'x is contingent' and 'x is a posteriori', and between 'x is necessary' and 'x is a priori'. There are several ways we can come to see that the assertion of these equivalencies is mistaken. (a) If there are two explanations of an event, I can only know which is the correct one by a posteriori means. But whichever one turns out to be acceptable must be necessarily true—about natural kinds and their powers and capacities—if it is to be an explanation at all. We might explain what makes this particular Mack truck go by saying that it has an engine with pistons that are moved by gasoline exploding in the cylinders

and that the movement of the pistons is communicated to the axles and wheels of the truck. But something might come to seem wrong with our explanation. The exhaust seems too thick for a gasoline motor and upon further checking it turns out to be a diesel-powered truck. Part of the previous explanation remains true, to be sure, but the part about exploding gasoline has to be rejected now and replaced by information about the nature of diesel fuel. We decide which explanation is the correct one wholly on a posteriori grounds, but it does not follow that the nature of gasoline and diesel fuel, their powers and capacities, are simply contingent. Given the appropriate conditions, gasoline must explode or it would no longer be accepted as the same particular. Assuming the appropriate conditions really had occurred but nothing happened, then the gasoline had magically changed into something else. The same, of course, can be said for diesel fuel. If the natures of these liquids are to explain their powers and capacities, then there must be a relationship of necessity among them—in short, there must be natural kinds in any world in which an explanation is possible.

(b) Another way of seeing that the alleged equivalencies of 'necessary' and 'a priori' and of 'contingent' and 'a posteriori' are false is to disclose the confusion in thought upon which the claim that they are rests. It is a variation on a confusion omnipresent in both traditional and contemporary thought, the confusion between the meaning of a proposition, on the one hand, and the grounds we have for holding it, on the other. The simplest example of this confusion would be the simplistic interpretation of 'cause' as 'constant conjunction'. That x and y always go together is one reason we might give for saying that x and y are causally related, but clearly the meaning of a specific causal statement cannot be exhaustively analyzed by a general statement. Modern regularity theorists, of course, realize this point and do not propose such an explicit definition of 'cause', but offer explications of it that have both specific and universal components.

The variation on this confusion, which is the crucial one for our discussion, is a second-order one. In holding that all

propositions known a posteriori must be contingent, one is assuming that a proposition itself must be characterized by, or have its nature determined by, the way we come to know it to be true. But clearly the nature of a proposition—including whether it is contingent or necessary—like its meaning, is independent of the way the proposition comes to be accepted as true, or known to be true. I believe on good grounds that a certain truck is gasoline-powered—it has only a faint exhaust, the driver stopped at a station which sells only gasoline, and so on. My belief, it is true, is based on a posteriori grounds, and it is always possible that I have been mistaken. Perhaps the driver was using the best grade of diesel fuel, only stopped at the station to ask directions, and had changed the usual position of the diesel exhaust. (How far can we legitimately doubt? Even after a chemist has analyzed the fuel and a mechanic looked at the motor?) But the dubitability of such evidence does not carry over to the nature, characterization of, or meaning of the proposition itself. Admittedly the proposition that the truck is gasoline-powered is known to be true a posteriori, and it is always logically possible that I am mistaken in believing it; but these facts do not affect in the slightest the necessity which the proposition itself presupposes if it is true at all. The nature of gasoline explains the explosive power as well as the capacities of gasoline, and this explanatory relationship of natural necessity exists quite independently of how propositions concerning it come to be held as true.

NOTES

1. "Tahāfut al-Tahāfut is the work for which this Cordovan philosopher was best known—and unfavorably so—in Eastern Islam. It came at a time when philosophy had become a monopoly of theologians, a servant of dogma." Philip K. Hitti, *Makers of Arab History* (New York: Harper and Row, 1971), p. 230. "Having laid so much stress on rational thinking, Averroism in due course aroused the same religious reaction [in Christianity] that Rushdism had aroused [in Islam]. . . . Paris spearheaded the attack. Its council in 1210 put the ban on the works of both Aristotle and Averroes." *Ibid.* p. 234. "Last of the great Arabic-writing philosophers, Ibn-Rushd produced no progeny in Islam. He belonged more to Christian Europe than to Muslim Asia or Africa" [and

then only as "the commentator"]. Philip K. Hitti, *History of the Arabs*, Tenth Edition (London: Macmillan, 1970), p. 583. ". . . Averroes was attempting to check the spread of Ash'arism, particularly in North Africa and Muslim Spain. The attempt, however, was abortive, and Aristotelian causal theory, though it continued to be held in Islam, remained on the defensive." Michael E. Marmura, "Causation in Islamic Thought," *Dictionary of the History of Ideas*, ed. P. Wiener, 4 vols (New York: Charles Scribner's Sons, 1973), p. 289. "In the Muslim east, the prevalence of Asharite theology in the official world and of Sufism in that of popular religion also created a climate hostile to intellectual innovation. Averroes did, however, play a major role in the history of Western philosophy, in part through his clarification of Aristotle's thought and in part because many Catholics misunderstood his doctrine of harmony and supposed that he preached the ascendancy of philosophy over religion. *Averroism* became a synonym for heresy." John B. Christopher, *The Islamic Tradition* (New York: Harper and Row, 1972), pp. 115-116. In his *Islam* (New York: Doubleday, 1968), Fazlur Rahman mentions Averroes only once, even though he devotes a chapter to The Philosophical Movement.

2. *Averroes' The Incoherence of the Incoherence*, trans. Simon Van den Bergh, 2 vols. (Oxford: Oxford University Press, 1954), I, p. 321.

3. Marmura, "Causation in Islamic Thought," p. 286. For a detailed account and criticism of Islamic occasionalism, see Majid Fakhry's *Islamic Occasionalism and Its Critique by Averroes and Aquinas* (London: Allen and Unwin, 1958).

4. Marmura, "Causation in Islamic Thought," pp. 288, 289. Professor Marmura refers his readers to R. M. Frank's "The Structure of Created Causality according to al-Ash'ari," *Studia Islamica* 25 (1966): 13-75.

5. William J. Courtenay, "The Critique on Natural Causality in the Mutakallimun and Nominalism," *Harvard Theological Review* 66 (1973): 77-94.

6. *Averroes' The Incoherence of the Incoherence*, I, pp. 316-333.

7. *Ibid.*, I, pp. 330-331. Cf. 327-329.

8. *Ibid.*, II, p. 182. Note on I, p. 326.7.

9. And it still remains the case that al-Ghazālī wants to salvage the "rod-into-serpent" type of miracle, in which case he is still vulnerable to what he took to be the telling *reductio* of "the philosophers." In *The Preserver from Error*, however, as Van den Bergh indicates, al-Ghazālī seems to reject this sort of miracle and to distinguish it from the case of the prophet. Cf. *Averroes' The Incoherence of the Incoherence*, II, p. 176. Van den Bergh's Note is for I, p. 315.6.

10. *Averroes' The Incoherence of the Incoherence*, II, p. 185. Van den Bergh's Note for I, p. 331.1.

11. *Ibid.*, I, p. 316. Cf. Al-Ghazālī, *Tahāfut al-Falasifah*, trans. S. A. Kamali, Pakistan Philosophical Congress (Lahore, 1958), p. 185; Marmura, "Causation in Islamic Thought," p. 288.

12. *Averroes' The Incoherence of the Incoherence*, I, p. 317.

13. Cf. E. H. Madden and R. Harrè, "In Defence of Natural Agents," *Philosophical Quarterly* 23 (1973): 121 ff.
14. *Averroes' The Incoherence of the Incoherence*, I, p. 318.
15. *Ibid.*, p. 319.
16. Cf. E. H. Madden, "A Third View of Causality," *The Review of Metaphysics*, 23 (1969): 67-84; E. H. Madden and P. H. Hare, "The Powers That Be," *Dialogue* X (1971): 12-31; and R. Harrè and E. H. Madden, *Causal Powers* (Oxford: Blackwell, 1975).
17. Van den Bergh observes that this argument of Averroes is the same as Aristotle's argument against the Heraclitean flux (*Averroes' The Incoherence of the Incoherence*, II, p. 178). Van den Bergh's note is for I, p. 318.3.
18. Sterling Lamprecht, *The Metaphysics of Naturalism* (New York: Appleton-Century-Crofts, 1967), p. 144.
19. *The Works of Aristotle Translated into English*, ed. W. D. Ross, 11 vols. (Oxford: Oxford University Press, 1908-1931), p. 78a, 25 ff., 30 ff.