
The Case for Determinism

Brand Blanshard

Introduction: Brand Blanshard was born in 1892 in Frederickburg, Ohio. After completing his bachelor of arts degree at the University of Michigan in 1914, he earned a master's degree at Columbia University. He was named a Rhodes Scholar and studied at Oxford University, receiving a bachelor of science degree there in 1920. Blanshard then enrolled in the graduate program in philosophy at Harvard University. He finished his doctorate in 1921 and then taught for four years at his alma mater, the University of Michigan. In 1925 he accepted a position at Swarthmore College, where he remained for twenty years. Blanshard then went to Yale University, where he was Professor of Philosophy until his retirement in 1961. He delivered the Gifford Lectures at the University of St. Andrews, Scotland, in 1952-1953 and was president of the American Theological Society in 1955-1956. He died in 1987 in New Haven, Connecticut.

Blanshard's numerous publications include *The Nature of Thought* (1939), *Education in the Age of Science* (1959), *Reason and Goodness* (1961), *Reason and Analysis* (1962), *Reason and Belief* (1974), and *Four Reasonable Men: Marcus Aurelius, John Stuart Mill, Ernest Renan, Henry Sidgwick* (1984).

Our reading is "The Case for Determinism," a paper Blanshard delivered at New York University in 1957. Blanshard begins by defining the philosophical position he will defend. *Determinism* is the view that every event is caused—that is, given the events that precede it, the event in question *must* occur. *Indeterminism*, by contrast, holds that there are some events that do not necessarily follow from their antecedents. Blanshard presents three reasons why reflective people reject determinism and accept indeterminism: (1) a deep-seated feeling that some of our human actions are free, (2) a conviction that contemporary physics (specifically, theories about the behavior of subatomic particles) supports indeterminism, and (3) a belief that determinism eliminates moral responsibility. Blanshard then explains why he finds each reason unpersuasive. (1) We feel free because we tend to look to the future, rather than to the past, where the causes of our action lie. (2) Recent discoveries in physics do not require us to posit indeterminacy on the subatomic level—and even if they did, this kind of indeterminacy does not imply free will on the human level. (3) Moral choices are necessitated by a person's internal ideals, and this kind of determinism "is the best kind of freedom."

—Donald Abel



I am a determinist. None of the arguments offered on the other side seem of much weight except one form of the moral argument, and that itself is far from decisive. Perhaps the most useful thing I can do in this paper is explain why the commoner arguments for indeterminism do not, to my mind, carry conviction. In the course of this explanation the brand of determinism to which I am inclined should become gradually apparent.

But first a definition or two. Determinism is easier to define than indeterminism, and at first glance there seems to be no difficulty in saying what one means by it. It is the view that all events are caused. But unless one also says what one means by "event" and "caused," there is likely to be trouble later. Do I include among events not only changes but the lack of change, not only the fall of the water over the cataract's edge but the persistence of ice in the frozen river? The answer is yes. By an event I mean any change or persistence of state or position. And what is meant by saying that an event is caused? The natural answer is that the event is so connected with some preceding event that unless the latter had occurred the former would not have occurred. Indeterminism means the denial of this. And the denial of this is the statement that there is at least one event to which no preceding event is necessary. But that gets us into trouble at once, for it is doubtful if any indeterminist would want to make such an assertion. What he wants to say is that his decision to tell the truth is undetermined, not that there is no preceding event necessary to it. He would not contend, for example, that he could tell the truth if he had never been born. No, the causal statement to which the indeterminist takes exception is a different one. He is not saying that there is any event to which some nameable antecedents are not necessary; he is saying that there are some events whose antecedents do not make them necessary. He is not denying that all consequents have necessary antecedents; he is denying that all antecedents have necessary consequents. He is saying that the state of things just before he decided to tell the truth might have been exactly what it was and yet he might have decided to tell a lie.

By determinism, then, I mean the view that every event *A* is so connected with a later event *B* that, given *A*, *B* must occur. By indeterminism I mean the view that there is some event *B* that is not so connected with any previous event *A* that, given *A*, it must occur. Now, what is meant here by "must"? We cannot in the end evade that question, but I hope you will not take it as an evasion if at this point I am content to let you fill in the blank in any way you wish. Make it a logical "must," if you care to, or

a physical or metaphysical¹ “must,” or even the watered-down “must” that means “A is always in fact followed by B.” We can discuss the issue usefully though we leave ourselves some latitude on this point.

With these definitions in mind, let us ask what are the most important grounds for indeterminism. This is not the same as asking what commonly moves people to be indeterminists; the answer to that seems to me all too easy. Everyone vaguely knows that to be undetermined is to be free, and everyone wants to be free. My question is rather, When reflective people accept the indeterminist view nowadays, what considerations seem most cogent to them? It seems to me that there are three: first, the stubborn feeling of freedom, which seems to resist all dialectical² solvents; second, the conviction that natural science itself has now gone over to the indeterminist side; and, third, that determinism would make nonsense of moral responsibility. The third of these seems to me the most important, but I must try to explain why none of them seem to me conclusive.

One of the clearest heads that ever devoted itself to this old issue was Henry Sidgwick.³ Sidgwick noted that, if at any given moment we stop to think about it, we always feel as if more than one course were open to us, that we could speak or be silent, lift our hand or not lift it. If the determinist is right, this must be an illusion, of course, for whatever we might have done, there must have been a cause, given which we had to do what we did. Now, a mere intuitive assurance about ourselves may be a very weak ground for belief; Freud⁴ has shown us that we may be profoundly deceived about how we really feel or why we act as we do. But the curious point is that, though a man who hates his father without knowing it can usually be shown that he does and can often be cured of his feeling, no amount of dialectic seems to shake our feeling of being free to perform either of two proposed acts. By this feeling of being free I do not mean merely the freedom to do what we choose. No one on either side questions that we have that sort of freedom, but it is obviously not the sort of freedom that the indeterminist wants, since it is consistent with determinism of the most rigid sort. The real issue, so far as the will is concerned, is not whether we can do what we choose to do, but whether we can choose our own choice, whether the choice itself issues in accordance with law from some antecedent. And the feeling of freedom that is relevant as evidence is the feeling of an open future as regards the choice itself. After the noise of argument has died down, a sort of intuition stubbornly remains that we can not only lift our hand if we choose, but that the choice itself is open to us. Is this not an impressive fact?

No, I do not think it is. The first reason is that when we are making a choice our faces are always turned toward the future, toward the consequences that one act or the other will bring us, never toward the past with its possible sources of constraint. Hence these sources are not noticed. Hence we remain unaware that we are under constraint at all. Hence we feel free from such constraint. The case is almost as simple as that. When you consider buying a new typewriter, your thought is fixed on the pleasure and advantage you would gain from it, or the drain it would make on your budget. You are not delving into the causes that led to your taking pleasure in the prospect of owning a type-

writer or to your having a complex about expenditure. You are too much preoccupied with the ends to which the choice would be a means to give any attention to the causes of which your choice may be an effect. But that is no reason for thinking that if you did preoccupy yourself with these causes you would not find them at work. You may remember that Sir Francis Galton⁵ was so much impressed with this possibility that for some time he kept account in a notebook of the occasions on which he made important choices with a full measure of this feeling of freedom; then shortly after each choice he turned his eye backward in search of constraints that might have been acting on him stealthily. He found it so easy to bring such constraining factors to light that he surrendered to the determinist view.

But this, you may say, is not enough. Our preoccupation with the future may show why we are not aware of the constraints acting on us, and hence why we do not feel bound by them; it does not explain why our sense of freedom persists after the constraints are disclosed to us. By disclosing the causes of some fear, for example, psychoanalytic therapy can remove the fear, and when these causes are brought to light, the fear commonly does go. How is it, then, that when the causes of our volition are brought to light, volition continues to feel as free as before? Does this not show that it is really independent of those causes?

No again. The two cases are not parallel. The man with the panic fear of dogs is investing all dogs with the qualities—remembered, though in disguised form—of the monster that frightened him as a child. When this monster and his relation to it are brought to light, so that they can be dissociated from the Fidos and Towsers around him, the fear goes, because its appropriate object has gone. It is quite different with our feeling of freedom. We feel free, it was suggested, because we are not aware of the forces acting on us. Now, in spite of the determinist’s conviction that when a choice is made there are always causal influences at work, he does not pretend to reveal the influences at work in our present choice. The chooser’s face is always turned forward; his present choice is always unique; and no matter how much he knows about the will and the laws, his present choice always emerges out of deep shadow. The determinist who buys a typewriter is as little interested at the moment in the strings that may be pulling at him from his physiological or subconscious cellars as his indeterminist colleague, and hence feels just as free. Thus, whereas the new knowledge gained through psychoanalysis does remove the grounds of fear, the knowledge gained by the determinist is not at all of the sort that would remove the grounds for the feeling of freedom. To make the persistence of this feeling in the determinist an argument against his case is therefore a confusion.

The second reason, I suggested, why so many thoughtful persons remain indeterminists is that they are convinced that science has gone indeterminist. Well, has it? If you follow Heisenberg, Eddington, and Born,⁶ it has. If you follow Russell, Planck, and Einstein,⁷ it has not. When such experts disagree it is no doubt folly for the layman to rush in. But since I am discussing the main reasons why people stick to indeterminism, and have admitted that the new physics is one of them, I cannot afford to be quite prudent. Let me say, then, with much hesitation that, as far as I can follow the argument, it provides no good

evidence for indeterminism even in the physical world, and that, if it did, it would provide no good evidence for indeterminism in the realm of will.

First as to physical indeterminism. Physicists now tell us that descriptive statements about the behavior of bodies are really statistical statements. It was known long ago that the pressure that makes a football hard is not the simple quality one feels in pushing something: it is the beating on the inner surface of the football of millions of molecular bullets. We now know that each of these bullets is a swarm of atoms, themselves normally swarms of still minuter somethings, of which the proton and the electron are typical. The physicist admits that the behavior of an enormous mass of these particles, such as a billiard ball, is so stable that we may safely consider it as governed by causal law. But that is no reason, he adds, for assigning a like stability to the ultimate particles themselves. Indeed, there is good reason, namely the principle of indeterminacy, for saying that they sometimes act by mere chance. That principle tells us that whereas, when we are talking about a billiard ball, we can say that it has a certain momentum and direction at point *B* as a result of having a certain momentum and direction at point *A*, we can never say that sort of thing about an electron. Why? Because the conditions of observation are such that, when they allow us to fix the position exactly, they make it impossible to fix the momentum exactly. Suppose that we can determine the position of a moving particle with more accuracy the shorter the wave length of light we use. But suppose that the shorter the wave length, the more it interferes with the momentum of the particle, making it leap unpredictably about. And suppose there is no way of determining the position without in this way leaving the momentum vague, or of determining the momentum without leaving the position vague. It will then be impossible to state any precise law that governs the particle's movement. We can never say that such-and-such a momentum at point *A* was necessarily followed by such-and-such a momentum at point *B*, because these statements can have no precise meaning, and can be given none, for either antecedent or consequent. Hence to speak any longer of nature as governed ultimately by causal laws—that is, statements of precise connection between antecedent and consequent—is simply out of the question.

This argument, as Sir David Ross⁸ has pointed out, may be interpreted in different ways. It may be taken to say that, though the particle does have a certain position and momentum, we can never tell, definitely and for both at the same time, what they are. Many interpreters thus understand the theory. But so taken, there is of course nothing in it to throw the slightest doubt on the reign of causality. It is merely a statement that in a certain region our knowledge of causal law has limits. Secondly, the theory might be taken to mean that electrons are not the sort of things that have position and momentum at all in the ordinary sense, but are fields, perhaps, or widespreading waves. This, too, has no suggestion of indeterminism. It would not mean that general statements about the nature and behavior of electrons could not be made, but only that such statements would not contain references to position and momentum. Thirdly, the theory might mean that, though these particles do have a position and a momentum, the position or momentum is not definitely this

rather than that. Even laymen must rise at this point and protest, with all respect, that this is meaningless. Vagueness in our thought of a position makes sense; vagueness of actual position makes none. Or, finally, the argument may mean that, though the particle does have a definite position and momentum, these cannot even in theory be correlated with anything that went before. But how could we possibly know this? The only ground for accepting it is that we do not know of any such correlates. And that is no reason for denying that any exist. Indeed, to deny this is to abandon the established assumption and practice of science. Science has advanced in the past precisely because, when things happened whose causes were unknown, it was assumed that they had causes nevertheless. To assume that a frustration of present knowledge, even one that looks permanent, is a sign of chance in nature is both practically uncourageous and theoretically a non sequitur.⁹

But let us suppose that the Eddingtonians are right and that what has been called "free will among the electrons" is the fact. Would that imply indeterminism in the realm that most nearly concerns us, the realm of choice? I cannot see that it would. The argument supposed to show that it would is as follows: Psychological processes depend on physical processes. But physical processes are themselves at bottom unpredictable. Hence the psychological processes dependent on them must share this unpredictability. Stated in the abstract, the argument sounds impressive. But what does it actually come to? We are told that, even if there is inconstancy in the behavior of single particles, there is no observable inconstancy in the behavior of masses of them; the particles of a billiard ball are never able to get together and go on a spree simultaneously. Eddington admitted that they might, just as he admitted that an army of monkeys with a million typewriters might produce all the books in the British Museum, but he admitted also that the chances of a billiard ball's behaving in this way were so astronomically remote that he would not believe it if he saw it.

The question of importance for us, then, is whether, if acts of choice are dependent on physical processes at all, they depend on the behavior of particles singly or on that of masses of particles. To this there can be but one answer. They depend on mass behavior. An act of choice is an extremely complex process. It involves the idea of one or more ends, the association of that idea with more or less numerous other ideas, the presence of desires and repulsions, and the operation of habits and impulses; indeed, in those choices for which freedom is most demanded, the whole personality seems to be at work. The cortical basis for so complex a process must be extremely broad. But if it is, the great mass of cells involved must, by the physicist's admission, act with a high stability, and the correlated psychological processes must show a similar stability. But that is what we mean by action in accordance with causal law. So, even if the physicists are right about the unstable behavior of single particles, there is no reason whatever for translating this theory into a doctrine of indeterminism for human choice.

We come now to the third of the reasons commonly advanced in support of indeterminism. This is that determinism makes a mess of morality. The charge has taken many forms. We are told that determinism makes praise and blame meaning-

less, punishment brutal, remorse pointless, amendment hopeless, duty a deceit. All these allegations have been effectively answered except the one about duty, where I admit I am not quite satisfied. But none of them are in the form in which determinism most troubles the plain man. What most affronts him, I think, is the suggestion that he is only a machine, a big foolish clock that seems to itself to be acting freely, but whose movements are controlled completely by the wheels and weights inside, a Punch-and-Judy show¹⁰ whose appearance of doing things because they are right or reasonable is a sham because everything is mechanically regulated by wires from below. He has no objections to determinism as applied by physicists to atoms, by himself to machines, or by his doctor to his body. He has an emphatic objection to determinism as applied by anyone to his reflection and his will, for this seems to make him a gigantic mechanical toy, or worse, a sort of Frankenstein monster.

In this objection I think we must agree with the plain man. If anyone were to show me that determinism involved either materialism or mechanism,¹¹ I would renounce it at once, for that would be equivalent, in my opinion, to reducing it to absurdity. The “physicalism” once proposed by Neurath and Carnap¹² as a basis for the scientific study of behavior I could not accept for a moment, because it is so dogmatically antiempirical. To use empirical methods means, for me, not to approach nature with a preconceived notion as to what facts must be like, but to be ready to consider all kinds of alleged facts on their merits. Among these the introspectively observable fact of reflective choice, and the inference to its existence in others, are particularly plain, however different from anything that occurs in the realm of the material or the publicly observable or the mechanically controlled.

Now, what can be meant by saying that such choice, though not determined mechanically, is still determined? Are you suggesting, it will be asked, that in the realm of reflection and choice there operates a different kind of causality from any we know in the realm of bodies? My answer is: Yes, just that. To put it more particularly, I am suggesting (1) that even within the psychical realm there are different causal levels, (2) that a causality of higher level may supervene on one of lower level, and (3) that when causality of the highest level is at work, we have precisely what the indeterminists, without knowing it, want.

1. First, then, as to causal levels. I am assuming that even the indeterminist would admit that most mental events are causally governed. No one would want to deny that his stepping on a tack had something to do with his feeling pain, or that his touching a flame had something to do with his getting burned, or that his later thought of the flame had something to do with his experience of its hotness. A law of association is a causal law of mental events. In one respect it is like a law of physical events: in neither case have we any light as to *why* the consequent follows on the antecedent. Hume was right about the billiard balls.¹³ He was right about the flame and the heat; we do not see why something bright and yellow should also be hot. He was right about association; we do not understand how one idea calls up another; we only know that it does. Causality in all such cases means to us little if anything more than a routine of regular sequence.

Is all mental causation like that? Surely not. Consider a musician composing a piece or a logician making a deduction. Let us make our musician a philosopher also, who after adding a bar pauses to ask himself, “Why did I add just that?” Can we believe he would answer, “Because whenever in the past I have had the preceding bars in mind, they have always been followed by this bar”? What makes this suggestion so inept is partly that he may never have thought of the preceding bars before, partly that, if he had, the repetition of an old sequence would be precisely what he would avoid. No, his answer, I think, would be something like this: “I wrote what I did because it seemed the right thing to do. I developed my theme in the manner demanded to carry it through in an aesthetically satisfactory way.” In other words, the constraint that was really at work in him was not that of association; it was something that worked distinctly against association; it was the constraint of an aesthetic ideal. And, if so, there is a causality of a different level. It is idle to say that the musician is wholly in the dark about it. He can see not only *that B* succeeded *A*; as he looks back, he can see in large measure *why* it did.

It is the same with logical inference, only more clearly so. The thinker starts, let us say, with the idea of a regular solid whose faces are squares, and proceeds to develop in thought the further characteristics that such a solid must possess. He constructs it in imagination and then sees that it must have six faces, eight vertices, and twelve edges. Is this association merely? It may be. It is, for example, if he merely does in imagination what a child does when it counts the edges on a lump of sugar. This is not inference and does not feel like it. When a person, starting with the thought of a solid with square faces, deduces that it must have eight vertices, and then asks why he should have thought of that, the natural answer is, Because the first property entails the second. Of course this is not the only condition, but it seems to me contrary to introspectively plain fact to say that it had nothing to do with the movement of thought. It is easy to put this in such a way as to invite attack. If we say that the condition of our thinking of *B* is the observed necessity between *A* and *B*, we are assuming that *B* is already thought of as a means of explaining how it comes to be thought of. But that is not what I am saying. I am saying that in thinking at its best, thought comes under the constraint of necessities in its object, so that the objective fact that *A* necessitates *B* partially determines our passing in thought from *A* to *B*. Even when the explanation is put in this form, the objection has been raised that necessity is a timeless link between concepts, while causality is a temporal bond between events, and that the two must be kept sharply apart. To which the answer is: Distinct, yes; but always apart, no. A timeless relation may serve perfectly well as the condition of a temporal passage. I hold that in the course of our thinking we can easily verify this fact, and, because I do, I am not put off by pronouncements about what we should and should not be able to see.

2. My second point about these causal levels is that our mental processes seldom move on one level alone. The higher is always supervening on the lower and taking over partial control. Though brokenly and imperfectly rational, rational creatures we still are. It must be admitted that most of our so-called

thinking moves by association, and is hardly thinking at all. But even in the duller of us “bright shoots of everlastingness,” strands of necessity, aesthetic or logical, from time to time appear. “The quarto and folio editions of mankind” can follow the argument with fewer lapses than most of us; in the texts of the greatest of all dramas, we are told, there was seldom a blot or erasure; but Ben Jonson¹⁴ added, and no doubt rightly, that there ought to have been a thousand. The effort of both thought and art is to escape the arbitrary, the merely personal, everything that, casual and capricious, is irrelevant, and to keep to lines appointed by the whole that one is constructing. I do not suggest that logical and aesthetic necessity are the same. I do say that they are both to be distinguished from association or habit as representing a different level of control. That control is never complete; all creation in thought or art is successful in degree only. It is successful in the degree to which it ceases to be an expression of merely personal impulses and becomes the instrument of a necessity lying in its own subject matter.

3. This brings us to our last point. Since moral choice, like thought and art, moves on different causal levels, it achieves freedom, just as they do, only when it is determined by its own appropriate necessity. Most of our so-called choices are so clearly brought about by association, impulse, and feeling that the judicious indeterminist will raise no issue about them. When we decide to get a drink of water, to take another nibble of chocolate, to go to bed at the usual hour, the forces at work are too plain to be denied. It is not acts like these on which the indeterminist takes his stand. It is rather on those where, with habit, impulse, and association prompting us powerfully to do *X*, we see that we ought to do *Y* and therefore do it. To suppose that in such cases we are still the puppets of habit and impulse seems to the indeterminist palpably false.

So it does to us. Surely about this the indeterminist is right. Action impelled by the sense of duty, as Kant¹⁵ perceived, is action on a different level from anything mechanical or associative. But Kant was mistaken in supposing that when we were determined by reason we were not determined at all. This supposition seems to me wholly unwarranted. The determination is still there, but, since it is a determination by the moral necessities of the case, it is just what the moral man wants and thus is the equivalent of freedom. For the moral man, like the logician and the artist, is really seeking self-surrender. Through him as through the others an impersonal ideal is working, and to the extent that this ideal takes possession of him and molds him according to its pattern, he feels free and is free.

The logician is most fully himself when the wind gets into his sails and carries him effortlessly along the line of his calculations. Many an artist and musician have left it on record that their best work was done when the whole they were creating took the brush or pen away from them and completed the work itself. It determined them, but they were free, because to be determined by this whole was at once the secret of their craft and the end of their desire. This is the condition of the moral man also. He has caught a vision, dimmer perhaps than that of the logician or the artist, but equally objective and compelling. It is a vision of the good. This good necessitates certain things, not as means to ends merely, for that is not usually a necessary link,

but as integral parts of itself. It requires that he should put love above hate, that he should regard his neighbor’s good as of like value with his own, that he should repair injuries, and express gratitude, and respect promises, and revere truth. Of course it does not guide him infallibly. On the values of a particular case he may easily be mistaken. But that no more shows that there are no values present to be estimated, and no ideal demanding a special mode of action, than the fact that we make a mistake in adding figures shows that there are no figures to be added, or a right way of adding them. In both instances what we want is control by the objective requirements of the case. The saint, like the thinker and the artist, has often said this in so many words. I feel most free, said St. Paul, precisely when I am most a slave.

We have now dealt, as best we can in a restricted space, with the three commonest objections to determinism. They all seem to admit of answers. To the objection that we always feel free, we answer that it is natural to feel so, even if we are determined, since our faces are set toward results and not toward causes, and the causes of present action always elude us. To the objection that science has gone indeterminist, we answer that that is only one interpretation of recent discoveries, and not the most plausible one, and that, even if it were true, it would not carry with it indeterminism for human choice. To the objection that determinism would reduce us to the level of mechanical puppets, we answer that though we are puppets in part we live, as Aristotle¹⁶ said, on various levels. And so far as causality in reflection, art, and moral choice involves control by immanent ideal, mechanism has passed over into that rational determinism that is the best kind of freedom.

NOTES

1. *metaphysical*: relating to *metaphysics*, the branch of philosophy that studies the fundamental nature of reality. [D.C.A., ed.]
2. *dialectical*: relating to *dialectic*, a philosophical method of investigating a topic by questioning and dialogue. [D.C.A.]
3. Sidgwick (1838-1900) was an English philosopher. [D.C.A.]
4. Sigmund Freud (1856-1939) was the Austrian neurologist who founded psychoanalysis. [D.C.A.]
5. Galton (1822-1911) was an English scientist. [D.C.A.]
6. Werner Heisenberg (1901-1976) was a German physicist; Arthur Eddington (1882-1944) was an English astronomer; Max Born (1882-1970) was a German physicist. [D.C.A.]
7. Bertrand Russell (1872-1970) was an English mathematician and philosopher; Max Planck (1858-1947) was a German physicist; Albert Einstein was an American (German-born) physicist. [D.C.A.]
8. W. Davis Ross (1877-1971) was a British philosopher. [D.C.A.]
9. *non sequitur*: an inference that does not follow from its premise(s) (literally, in Latin, “it does not follow”). [D.C.A.]
10. *Punch-and-Judy show*: a traditional comic puppet show about the quarrelsome Punch and his wife, Judy. [D.C.A.]

11. *Materialism* is the theory that everything is composed entirely of matter; *mechanism* is the theory that all natural processes can be explained mechanically, in terms of masses in motion. [D.C.A.]
12. Otto Neurath (1882-1945) was an Austrian sociologist and philosopher; Rudolf Carnap (1891-1970) was an American (German born) philosopher. According to their “physicalism” theory, all behavior can be described in terms of physical states. [D.C.A.]
13. David Hume (1711-1776) was a Scottish philosopher and historian. Hume argued that when we observe one billiard ball strike a second ball, and then see the second one move, we observe simply one event followed by another; we do not observe (or know) that the first event caused the second. [D.C.A.]
14. Jonson (1572-1637) was an English dramatist. [D.C.A.]
15. Immanuel Kant (1724-1804) was a German philosopher. [D.C.A.]
16. Aristotle (384-322 B.C.E.) was a Greek philosopher. [D.C.A.]

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