Causality and Economic Theory
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While economists are perennially concerned about causes and effects, the subject of causality has traditionally been the preserve of philosophers. That is why Professor Hicks' slim new book, *Causality in Economics* (Basil Blackwell, Oxford, 1979, pp. xii+124), is an unusual and important venture; it is an economist's attempt to examine the nature of causality in relation to his own subject. The book (henceforth *Causality*) falls into three different parts. The first three chapters are a semi-philosophical treatise on causality and time and they comprise the theme of the book. Chapters 4 to 7 are on economics. Diverse examples from the subject are drawn to illustrate the various propositions about causality propounded in an abstract form in the opening chapters. The final chapter is a discourse on the foundations of probability and the tone once again is philosophical.

**On the Edge of History and the Sciences**

The stage is set by arguing that the relation between economics and causality is a special one. And one of the reasons for this is the special relation between economics and time.

Experimental science, Hicks argues, is out of historical time, meaning the date of an experiment is immaterial. Economics, on the other hand, is in time and is in this sense akin to history. And thus Hicks' observation which is already beginning to acquire the status of an aphorism: "Economics, accordingly, if it is on the edge of the sciences is also on the edge of history; facing both ways, it is in a key position" (p. 4). But what does it mean for a subject to be in time?

Hicks has been writing about this for some time now. And a careful reading of *Causality* and some of his other works makes it clear that by

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this he means that economic facts "are not permanent, or repeatable, like the facts of the natural sciences" (p. 3 of his "Revolutions"). This view is connected to Hicks' other view that different economic theories are applicable to different times. But time in itself cannot affect anything: if everything is the same in two different time periods then the effects must be the same. While there are philosophical schools which would not accept this proposition, economists in general do; and it appears from his later remarks (see p. 106 of Causality) that Hicks would.

What then does it mean to say that the time of an experiment matters? Consider a proposition like 'A causes B'. What Hicks' position amounts to is that though we frequently make such observations in economics, and perhaps we have to, our subject does not really permit such general propositions. What is more likely to be valid is a qualified statement like 'A, in the inter-War type of world, causes B'. Certainly there are specific features of the inter-War period which are relevant but these are so enmeshed in the actual ethos of that period that not only is it impossible to reconstruct them for any experiment, but it is not even possible to conceptually single them out and state them. And consequently we are forced to bring time into our propositions: A causes B in an inter-War type of world. And often when we do not qualify explicitly by specifying a period of relevance, such a specification is implicit. This seems to be one plausible interpretation of Hicks' fundamental proposition that economics is in time.

And now we can see why Hicks claims that the sciences, unlike economics, are not in time. Consider the proposition: A stone dropped from a tower will accelerate at 32 feet per second (in brief, proposition P). Imagine for the sake of argument that in the nineteenth century the atmosphere was extremely rarefied but in the twentieth century it is very dense. P will then be found to be valid in the nineteenth century but not in the twentieth. Observing this scientists may first assert that 'P is true in the nineteenth century'. But soon they would realise that it is a particular aspect of the century that is relevant, namely the rarefied atmosphere. Then they can drop the reference to the time period in the hypothesis and restate it by saying that 'P is true in a vacuum'. Hicks' remarks amount to the assertion that this is generally possible in the sciences. In economics, on the other hand, from a statement like "Keynes' theories were applicable in the thirties," it is very difficult, if not impossible, to abstract the essence of the thirties and restate it without reference to the thirties.2

While this is a very subtle and interesting observation, it is however

2Contrast this to Nagel's observation in his "Assumptions in Economic Theory," American Economic Review, (May 1963) that "most if not all statements of a theory" should be free of spatiotemporal "restrictions."
important to note that a large part of economic research is an effort to extract its theories out of time. Thus a lot of modern macroeconomic research is directed towards finding out as to what the features of the thirties were which made Keynesianism valid. Thus Malinvaud’s attempt at classifying economies!

Hicks argues that in economics a double-vision is needed: the ex ante view and the ex post. And he uses a brilliant example from astronomy as analogy (the analogousness of which is, however, questionable): whether the earth moves round the sun or the sun moves round the earth is simply a matter of point of view. The child and the priest, who believe that it is the sun that moves, cannot be castigated for stupidity. A good astronomer needs this double-vision.

Hicks uses this double-vision argument also to deliver us from the well-known incompatibility between freedom and rationality on the one hand and determinism on the other. If determinism is true then we cannot hold individuals responsible for their deeds. And further, what then is the meaning of rationality? Thus J.R. Lucas writes, “Determinism is felt to be a threat not only to humanity, but to rationality.” Rationality being central to large areas of economics, this controversy stares the economist in the face. Hicks tries to rescue the economist by asking him to maintain a double vision: to treat the past as deterministic but not the future. This however is not a solution at all but a method of closing ones eyes to the problem. While that may at times be a good idea, there is a case for trying to discover avenues out of this quandary. A few pages in the form of an Appendix are set aside for this purpose.

Defining Causality and its Categories

What is causality? In his article, “The Austrian Theory of Capital and its Rebirth in Modern Economics” Hicks writes, “We compare two alternative paths that extend into the future. Along one of those paths some new ‘cause’ is not operating; along the other it is. The difference between the paths is the effect of that cause.” This is an elegant method, but there may of course be serious problems in conceiving of an imaginary world in

3As Ved Mehta puts it, not surprisingly more poetically, in his Fly and the Fly-Bottle, Encounters with British Intellectuals (Weidenfeld and Nicolson, 1961, p. 214): “Were all thieves kleptomaniacs? Were the Genghis Khans and Adolf Hitlers helpless victims of circumstance? Should we therefore substitute the psychiatrist’s couch for the Hangman’s noose?”


5Published in J.R. Hicks and W. Weber (eds), Carl Menger and the Austrian School of Economics.
which something that has happened in reality does not happen, all other things being the same. The problem hinges on whether we think of the world as composed of neatly detachable events or not.

In Causality, Hicks gives a briefer and more ambiguous definition, the essence of which is the same: 'A causes B' according to this means 'not-A implies not-B'. There are problems with this. Firstly, this definition simply shifts the difficulty of defining 'causes' to another equally mystifying term 'implies'. Secondly the term 'not-A' can be quite an ambiguous description of the world. (Before discussing this problem further I should stress that Hicks is not unaware of these difficulties. But I shall come to that later.) The problem is best discussed with an example. Consider the statement: The red flag fluttering in the breeze caused the bull to charge. Let A stand for 'the red flag fluttering in the breeze'. What then is not-A? A blue flag fluttering in the breeze? A red flag sagging from a pole? An absence of any flag whatsoever? Actually all these are not-As. In fact, not-A is a collection of social states rather than being a specific one. Viewed in this way, Hicks' definition is not at all clear. Bulls have been known to charge for a variety of reasons; and the absence of a red flag is no guarantee of timidity on the part of the horned creature.

Hicks, however, is too perceptive a writer not to observe this difficulty. And sure enough he faces it squarely (pp. 8 and 26). 'Not-A', he argues, would be meaningful in the context of some given theory. While clearly that helps, it does not solve the entire problem. Consider a general equilibrium model. The only variables that can change ceteris paribus are the exogenous variables. For all other variables a ceteris paribus change is not only ambiguous but is usually an impossibility. Thus if in a standard neo-classical general equilibrium model we want to know the effect on demand of a change in price we cannot do this by considering two different prices with all other things remaining unchanged. This is so because different prices are typically commensurate with different exogenous conditions. So when we think of a price change we have to allow for changes in exogenous variables. And these latter changes are not uniquely given. And we are thus back to the difficulty mentioned above. This problem does not arise only if the cause is an exogenous variable. In practice this can be a very serious problem because it is possible that in reality there are no exogenous variables (see p. 22 of Causality for a very incisive observation about exogenous variables in economics).

Actually what is wrong is probably to expect a cogent definition of 'cause' in this book. For such an exercise one would have to go to a philosophical treatise. In introducing any difficult concept, like causality or power, there are two extreme options (with possible combinations): We could first define it carefully and then use it. And alternatively, we could proceed directly to use it hoping that people have a reasonably uniform
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notion of the concept, or at least they will learn its meaning as they read on. Hicks adopts this second route and there is no harm in that.

Hicks next proceeds to classify causality. And this is somewhat overdone. Thus we learn about weak causality, strong causality, separable and non-separable ones; overlapping causality, mutual causality, contemporaneous and static ones. Some of these could have been dropped or at least left unchristened without any significant loss.

Hicks argues that Hume's principle that a cause necessarily precedes (in time) its effect, is not infallible, that causality can be contemporaneous. His argument is ingenious. He claims that our adherence to Hume's principle is caused by a false belief that every cause and effect takes place in points of time. In reality these could be spread over intervals of time. Take an example. The good sleep last night was caused by the pitter-patter of rain throughout the night. This is an example of contemporaneous causality: both the cause and the effect are spread over the same interval. This also shows that mutual causality (i.e. a two-way causality) is a distinct category, since the rain was clearly not caused by the good sleep.

We are now ready to appreciate the meaning of static analysis in economics. If in contemporaneous causality we keep stretching the interval of time towards infinity what we get in the limit is static causality, which is the cornerstone of long-run static analysis in economics.

It is interesting to note that though Hicks brings in time in a fundamental way for classifying causality, in principle, this is not necessary. Thus in abstract modelling it is possible to rigorously define the meaning of one variable being causally prior to another without any reference to time. Herbert Simon discusses this at length in his paper "Causal Ordering and Identifiability" (in W.C. Hood and T.C. Koopmans eds, Studies in Econometric Method, Yale University Press, 1953). There he outlines a method of arranging equations in a linear system so as to identify the causal ordering among variables. And despite the absence of time, it is possible in his framework to talk of contemporaneous and mutual causality.

6The best example of this is ‘time’. We all know what it is and so when a person speaks about time his listeners understand him. But most efforts to define it have ended in a profusion of semantics. Thus the well-known story of a gentleman who, not too conversant with the English language and worried that he would miss his dinner party, asked his companion in the bus, ‘Sir what is time?’ The companion who was a professor of Philosophy (it is reported) sat up and spoke continuously till the bus reached the depot. The man missed his dinner and was no wiser for that.

7This is exactly the way a child learns. No one would try and teach a child what a square is by defining it. So we keep using the word and pointing out squares to him. And gradually the child learn its meaning and understands exactly what his father means when he refers to a square garden, even though neither the father nor the son can define it.
While time is of course important in reality, a large number of economic models are specified without reference to time. One possible way of interpreting causality in such models is in terms of what Hicks calls static causality, but that is not the only one. Simon's atemporal notions of causality could also be of relevance.

Chapter 3 focuses on another complex issue. Causality is a relation between facts. But two distinct facts can never be linked by using logic only. Consequently there must be some empiricism implicit in causal statements. This seems fine but the problem is that in practice we often refer to causality as though it was an alternative to empiricism, as though it reveals some inner linkages between disparate facts. This however is wishful thinking. There is unfortunately no escape from empiricism; and thus Hicks observes that causality "has to begin from some proposition, some relation between characteristics that has already been recognised, and that cannot be provided by deduction" (p. 28).

Chapter 3 appears over-simple, particularly if one has not reflected on these issues earlier. It is a chapter of many subtleties and insights. It is worthwhile, at this point, to take a closer look at the relation between causality and empiricism. In doing so we refrain from delving into the well-known problem of distinction between facts and theories. There is however no attempt to deny that genuine difficulties arise if we allow for the possibility that what we describe as facts may depend on our a priori theoretical beliefs. The ensuing argument is motivated from Causality but is not contained in it and should not therefore be attributed to Hicks.

Assume that a professor in Chicago has amassed a wealth of data and he observes that whenever the money supply has increased, a year later prices have risen. And he puts forward the general proposition that "increases in money supply lead to inflation." One standard reaction to this is that this proposition is based on pure empiricism and till one can show that money supply causes inflation we cannot accept this proposition. This reflects a belief that causality can somehow deliver us from empiricism. But that can never be.

What would a typical causal explanation of the above proposition consist of? Presumably something like this: Given (i) that a money supply increase means a larger money balance with individuals, and (ii) that as the money balance increases individuals spend more, and (iii) that with increased spending prices rise, it is clear that inflation is caused by increases in money supply.8

Notice that in this argument the building blocks, namely (i), (ii) and

8Of course, I am aware that this is not a very good argument. But for our present purpose we do not really need a good argument but merely need to pretend that we have one.
(iti) are once again purely empirical statements. So when we show causality between two facts we merely break up the route between these two facts into shorter steps, each of which is based on empiricism. Consequently if one finds the Chicago professor's proposition unacceptable because it is based on pure empiricism, then even a causal explanation will not satisfy one. Thus the above criticism of empiricism is an inconsistent one.

What we can reasonably argue is that the above proposition is unacceptable not because it is based on correlation but because it is not based on a sufficiently well-founded correlation. We could then legitimately ask the professor that given that is so, could he establish the link between money and prices in terms of certain better known facts or correlations.

This leads one to reemphasise the traditional view, so wantonly violated in modern theorising, that in constructing a theory the axioms should be more obvious (better founded empirically) than the final propositions.9 There are some versions of consumer theory where one gets the distinct feeling that the law, that as price falls demand increases, is much more obvious than the abstruse axioms used to derive this.

Where does Hicks' view fit into all this? As mentioned above, a large number of people betray in their talk a belief that causality can help us dispense with pure empiricism. Hume,10 on the other hand, argued that causality is nothing else but well-founded correlation. Hicks argues that in order to show causality we need a "theory." It is not absolutely clear as to what he means by theory. From the above discussion it is obvious that for a causal explanation one needs to share with one's listeners a belief in certain basic facts using which the causal link is established. So by a "theory" if Hicks means a framework of 'accepted' facts, his view is exactly what we have discussed in this section.

There is, however, no attempt to deny that other interpretations of Hicks' analysis are possible.

Illustrations from Economics

The section on economics begins with an example of a static theory from Adam Smith. The example is used to introduce two important concepts: the Economic Principle and the Equilibrium Method. The

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10In his An Enquiry Concerning Human Understanding, what is being attributed to Hume here is often referred to as the official Humean view. For some other ways of interpreting him, see O. Hanfling, "Hume's Idea of Necessary Connexion," Philosophy, 1979, Vol. 54, pp. 501-14.
Economic Principle refers to a principle which is very commonly used in economic analysis. It asserts that relative advantage leads to relative wealth. There are two ways of viewing this principle. Firstly, we could treat it as being empirical. In that form it amounts to an assertion that people are rational. It is, however, important to note that in an inter-dependent world it is possible for each individual in a group to behave rationally, but for the group to behave irrationally (examples of this abound in Game Theory). Thus, strictly speaking, the Economic Principle should be applied only to individual decision-making. And if one does apply it to group decisions or international decisions it should not be equated with the assumption of individual rationality. It then amounts to a much stronger and probably empirically false assertion.

There is a second way of interpreting this principle, i.e. as a definition. This amounts to defining economic actions as those actions which are consistent with the Economic Principle. Viewed in this way, this principle is not at all a denial of the fact that human beings do not always behave so as to maximise welfare.

A situation where the Economic Principle has worked itself out, i.e. agents have opted for the most advantageous position among all the positions open to them, is an equilibrium situation. The Equilibrium Method is an approach in which we compare alternative equilibria in the same time period under alternative hypothetical assumptions.

In the context of static theories, Hicks examines the 'classical' steady state and the 'neo-classical' production function; and he claims to be an adherent of neither.

He returns once again to contemporaneous causality, this time to argue that “this is the characteristic form of causal relation in modern economics” (p. 63). A variety of examples are used to establish this. At times there is a tendency to stretch and twist examples too much to get them to fall into the slot of contemporaneous causality. In some of these examples Hicks himself point out how some causes may precede their effects. But then through certain redefinitions he manages to make them contemporaneous. In these Hicks versus Hicks arguments, frequently the reasons in favour of contemporaneous causality appear contrived. This has the risk of making people believe that the notion of contemporaneous causality itself is contrived, which is far from true.

Chapters 6 and 7 are on Keynesian macroeconomics. These discussions

31Indeed, even here, there is room for reservations. The importance of human ignorance and non-hedonistic motivations have been pointed out often enough. The human love of novelty is also increasingly being emphasised. As F. Knight had observed in his “What is Truth in Economics?” Journal of Political Economy, 1940, Vol. 48, “... our interests are to a considerable extent explorative in a more intrinsic sense; the motive of action is in part curiosity as to what the result will be, and hence depends on partial ignorance of the result when the action is performed.”
are strung around causality—contemporaneous and sequential, but Hicks often digresses into pure economic analysis. And fortunately so, because some of the best sections of the book are these digressions. His remarks on the concept of general equilibrium (p. 79 particularly note 10) are interesting and his suggestions for a new theory of liquidity (pp. 96-100) are full of insights.

By Keynesian macroeconomics Hicks means the ISLM analysis. This we all know, does not capture the entirety of Keynes. But nevertheless there seems little reason to object to the use of ISLM to represent at least the basics of Keynes, particularly since Keynes himself had found it quite appropriate. Their points of disagreement and the gradual convergence of opinions is captured well in the letters exchanged between Hicks and Keynes on this subject: see D. Moggeridge (ed.), Collected Works of John Maynard Keynes Volume 14, Macmillan, 1973, pp. 71-83.

The ISLM analysis has three building blocks: the consumption function, the marginal efficiency of capital schedule and liquidity preference. The first two could be thought of (with some manipulations) as contemporaneous causal relations. But a problem arises with the last relation. This is a stock relation which refers to points of time rather than intervals. It turns out that this fits better in the frame of sequential causality which is the traditional view of causality with the cause preceding the effect. This is the context in which Hicks discusses the possibility of a new theory of liquidity.

Two Views on Probability

The final chapter consists of a discussion of the foundations of probability. Hicks discusses two traditional views of probability: the frequency theory and the axiomatic theory.

According to the frequency theory the probability of an event is determined by the frequency of its occurrence in a large number of repetitions of an experiment. Having stated it in this traditional fashion, Hicks points out, with his characteristic attention to detail, that there is one problem with this definition. If the repetitions of the experiment are identical, then the results will be identical as well. (Of course this presumes a deterministic view of the world.) So while the repetitions should be similar for the results to be meaningful, they must not be identical.

In economics, Hicks argues, the other definition is very important. This alternative view, which is maintained by Keynes and Jeffreys, treats probability as a degree of belief. In discussing Jeffreys' axioms for proba-
bility, Hicks criticises the axiom which claims that "of two alternatives that are open on given information, either one is more probable than the other or both are equally probable." This is an analogue of the completeness axiom in consumer preference theory. And in the same vein in which the completeness axiom has been criticised in consumer theory, Hicks proceeds to criticise this axiom of Jeffreys: while for a given event there would be some more likely and some less likely events, there would typically also exist a grey band of events that are (given our knowledge) neither more likely nor less likely. They simply cannot be ranked.

While Hicks' criticism is probably valid, it is not clear how useful this weaker notion of probability is. And if it is not too useful it is not obvious that we should retract in the manner suggested by Hicks. After all, the likely validity of any assumption increases with its weakening but we do not weaken assumptions endlessly because their power of explanation then declines. The weakening of utility, from cardinal to ordinal, was widely accepted because Hicks showed that most of our precious results in consumer theory remained unchanged. What is being argued is that Hicks has not done a similar exercise here, while inducing us to drop the completeness axiom in making probability comparisons.

Hicks' position of course tends to undermine the relevance of statistical methods in economics. And this is one of the conclusions that Hicks reaches. The "statistical approach"—presumably thereby meaning econometrics—may not be as useful as is conventionally supposed. According to Hicks, it encourages the deduction of general laws from inadequate information. And it also tends to make us suppress considerable nonquantifiable information. That cannot be justified. "The probability calculus is no excuse for forgetfulness" (p. 122).

In Retrospect

All said and done, how does one rate the book overall? This cannot be answered in one line, hence this paper. But nevertheless at the risk of over simplification I would say the following. It is a very unusual book. It has sparks of remarkable insights, an occasional ability to cut through a mass of detail to highlight a point of great subtlety. But despite all this, the book in its entirety is a disappointment. One of the causes of this is no doubt that one expects too much from Hicks. The book lies on the edge of economics and the edge of philosophy, and despite the many sparkles of brilliance, large tracts remain mechanical and are unlikely to cause a stir in either discipline. This does not, of course, in any way change ones conviction that to economists many years hence, looking back at the twentieth century, Hicks will appear as large and outstanding as do to us Pareto, Jevons and Marshall.
Appendix: Rationality and Determinism

The alleged conflict between rationality and determinism has a close cousin. According to a popular view: 'If determinism is true, then one's future is predetermined and hence one need not make any effort'. Similar arguments have led to allegations of inconsistency in Marxist thinking. Since for a Marxist, socialism is inevitable, why does he advocate that people strive towards it? Is it not like an astronomer advocating the eclipses he predicts? I shall argue that this paradox and the one which Hicks refers to—the conflict between rationality and determinism—arise from the same root cause.

It is argued by Lyons in his "Determinism and Knowledge", Analysis, 1975, that paradoxes of this kind "stems from a belief that all causality must be at the billiard-ball level." His argument, while correct, lacks catholicity. What is it that makes a billiard-ball different from a human being, in the context of determinism? This question would have been answered in the process of examining the problem raised by Hicks.

A definition of determinism is called for at the very outset. It can be said, risking over-simplicity, that an agent is determined if its actions are totally dependent on causes outside its control. In the case of human beings, determinism adopts the view that an individual's thoughts and actions are totally determined by his heredity and environment, which will be referred to, for brevity, as 'external factors'.

All the above fallacies stem from an implicit belief that determinism precludes the possibility that any incident in a human being's life could depend on factors which are not external. That is, there is a tendency to believe that since (assuming determinism) whether John reads Macbeth or not depends on external factors, it cannot depend on John's penchant for Shakespeare. But clearly, this need not be. Certainly, \( x \) is a function of \( y \), does not imply that \( x \) is not a function of \( z \). A composite function is also a function. Hence, \( x \) could be a function of \( z \), which in turn could be a function of \( y \). This fallacy will be referred to, in belief, as FIB—the fallacy of the ignored bridging function.

Now, consider the problem of determinism and effort. The belief that if determinism is true then one need not make any effort in life, could be illustrated with an example. John is about to take an examination and he wants to pass it. The question is whether he should study or not. It may seem that if determinism is true, then he need not. This conclusion is a consequence of the following belief:

(A) If determinism is true, then John cannot alter the outcome of the examination by studying or not studying.

But (A) is false and stems from FIB. (A) implies a denial of the existence of a function or mapping between the set consisting of studying and not studying to the set consisting of passing and failing. Clearly,
determinism does not necessitate this. Determinism merely says that whether John will pass or fail is predestined. In fact, it is quite possible that there exists an immutable natural law that an examinee will pass if, and only if, he studies. In deciding whether to study or not, all John needs to know is this natural law which implies:

(B) If John want to pass then he should study.

If determinism is true, then whether he will pass or not is predetermined but that is only because whether he will study or not is predetermined. Hence, determinism is compatible with (B) and (A) is therefore false. So when John asks whether he should study for his examination, a determinist need not be in a quandary. The fact that the outcome of the examination is predetermined in no way affects the answer, "You should study if you want to pass." This answer is unchanged whether or not one is a determinist. Similarly, there is no contradiction in saying that socialism is inevitable, and that people must strive for socialism. It does, of course, imply a belief that it is inevitable that the people will strive towards socialism. And when an astronomer advocates the eclipses he predicts, it is thought to be foolish, not because it is foolish to advocate predestined events as seems to be implied by Magee in Popper (Fontana, 1973, p. 95), but simply because eclipses, unlike socialism, cannot be brought about by human striving.

Now consider the problem of rationality and determinism. It is worth noting at the outset that, if rationality is taken to mean—as is frequently done in the social sciences—some sort of consistency in a person's behaviour, then, obviously rationality need not contradict determinism. A magnetic needle, which always points north, behaves consistently, though its behaviour is undoubtedly determined. The conflict is supposed to be between determinism and rationality, when rationality is defined in terms of some sort of a motivation, like the motivation to maximise happiness or utility.

The alleged incompatibility could be expressed as follows. Consider the statements (a) and (b).

(a) An agent's actions are determined by external factors.

(b) Faced with a set of alternatives, an agent selects so as to maximise his happiness or preference.

(b) is not a tautology. It suggests that an agent has a preference relation over the domain of alternatives, and he chooses so as to maximise his preference (i.e. he chooses from his choice set).

The problem arises from the belief that if (a) is true, then (b) is false. Lucas (op. cit., p. 27) writes, "If determinism is true, then my actions are no longer really my actions, and they no longer can be regarded as having been done for reasons rather than causes." This is not true. Reasons and causes are not mutually exclusive. Determinism does not imply that an agent's actions are not determined by his preference. It simply says that
his actions are totally determined by external factors. It is clearly possible that an agent's action is a function of his preference, which in turn is a function of external factors. This implies that both (a) and (b) may be true. These statements had seemed incompatible because of FIB. Now it is obvious why a billiard-ball and a human being are different in spite of the fact that the actions of both are determined. In both cases (a) is true, but (b) is true only for human beings. For both, external factors totally determine behaviour, but only for human beings the causal chain runs through reason and preference on its journey from external factors to behaviour. Similarly determinism does not imply that there is no difference between a fettered man and a man who is sitting still because the latter, unlike the former, can walk off if he wants to.