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III.—WILL THE FUTURE BE LIKE THE PAST?

By Frederick L. Will.

I.

In the elaboration of arguments in the last two hundred years for and against scepticism concerning induction, one central point at issue has been that concerning the "uniformity of nature" and the necessity of assumptions about that uniformity in all inductive reasoning. To this point the sceptics have again and again recurred, following the precedent of Hume, in their arguments to show the overall doubtfulness, the absolutely irremediable lack of cogency of inductive arguments in general; and to this point also have recurred their opponents in their endeavours to refute these same sceptical conclusions. The question which the sceptics have raised concerning the uniformity of nature is expressed partially and in non-technical language in the question of the above title, "Will the future be like the past?"

There is an advantage of simplicity and clarity in expressing the question thus with reference to the future, as Hume himself did in the *Enquiry*, even though quite clearly the question of the validity of inductive procedures is by no means restricted to conclusions about future things or events. The question about induction which both the sceptics and their opponents have attempted, each in their own way, to answer is a question about all those procedures in which, in science and everyday life, we use the evidence of observed facts or states of affairs to conclude concerning unobserved ones. The unobserved matters about which the conclusion is drawn may be in the past or present as well as in the future. In each case the basic procedure is the same. On the basis of observations now being made or already made which reveal that certain things have a specified characteristic, or set of characteristics, it is concluded that other events or things of the same kind, though unobserved, in the past, present, or future, have these same characteristics. And the question raised about this procedure is likewise the same. By what right do we conclude from the observed to the unobserved? Granted that all the cases which have been tested have shown hydrogen to be inflammable, by what right do we conclude on this evidence

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that under similar conditions hydrogen has always been, is now, and will continue to be inflammable?

Abstracting from this more general question about induction it is permissible, in the interest of simplicity, to consider the question in but one of its temporal phases, namely that referring to the future. This phase may justly be viewed as a test case of the general question. To the extent that our inductive conclusions about the future can be justified, so can our inductive conclusions be justified generally. If inductive methods can be shown to be all completely without justification when their conclusions refer to the future, this conclusion can be easily generalised to apply to all inductive conclusions whatsoever; and if inductive procedures can be justified in so far as they refer to the future, by exactly the same procedure, and with exactly the same kind of evidence, they can be justified when their conclusions are drawn concerning the present and the past. It may be noted also that even with this restriction of reference solely to the future the question of inductive validity still bears directly upon the question of the validity of scientific laws, which is the aspect of induction which has always appeared to philosophers as most provocative as well as fundamental. For these laws are statements about the course of nature, the connexions between things and events, not only as they are in the present, or have been in the past, but also as they will be in the future.

II.

The standard argument for complete inductive scepticism, for the belief that inductive procedures have no rational and no empirical justification whatever, is the one stated in a small variety of ways in the writings of Hume. If one consults these writings in search of an answer to the question of inductive validity one finds the same clear answer argued first in technical detail in the *Treatise*, secondly compressed into a few non-technical paragraphs in the *Abstract of a Treatise of Human Nature*, and thirdly, presented again in a non-technical but somewhat fuller version in a chapter in the *Enquiry Concerning Human Understanding*. There is no basis whatever for any conclusion concerning future matters, according to this argument; there is no way whatever in which such conclusions can be established to be certainly true or even probable. For in the first place no such conclusion can be demonstrated by reasoning alone, since they are all conclusions about matters of fact, and since it is the case that the denial of any assertion of a matter of fact is not self-contradictory. But if one gives up the rationalistic aspiration to

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demonstrate propositions about matters of fact or existence *a priori*, and turns instead to experience, this road, though apparently more promising at first, likewise ends by leading one exactly nowhere. Clearly no statement about future matters of fact can be established by observation. Future things cannot be observed. Any event or state of affairs which can be observed is by definition not in the future. The only recourse which remains therefore is the inductive procedure of employing present or past observations and inferring therefrom the nature of the future. But this procedure to which we are all forced, or rather, to which we all should be forced, if we did not, in company with the animals, use it naturally from birth, is in the light of close analysis completely indefensible. For such reasoning assumes, and is quite invalid without the assumption, that the future will be like the past.

> ". . . all inferences from experience suppose, as their foundation, that the future will resemble the past, and that similar powers will be conjoined with similar sensible qualities. If there be any suspicion that the course of nature may change, and that the past may be no rule for the future, all experience becomes useless, and can give rise to no inference or conclusion." [1]

Will the future "resemble the past"? Or be "conformable to the past"? These are the ways in which in the *Enquiry* Hume expresses the question concerning the uniformity of nature, restricting to its reference toward the future the question which already had been asked in broader terms in the *Treatise*. There, without the temporal restriction, it is argued that the principle of inductive conclusions, the principle upon which reason would proceed if reason determined us in these matters, is "*that instances, of which we have had no experience, must resemble those, of which we have had experience, and that the course of nature continues always uniformly the same*". (Bk. I, Pt. III, Sect. VI.)

However the principle is stated, the argument about it remains the same. It is indispensable, if inductive conclusions are to be justified; but just as it is absolutely indispensable, so, and this is the measure of our logical misfortune, it cannot be established as certain or as probable in any way. It cannot be established by any demonstrative argument. For it is clearly an assertion of a matter of fact, and therefore the kind of assertion whose denial is non-contradictory and conceivable.

[1] *Enquiry Concerning Human Understanding*, Sect. IV, § 32. The arabic numerals in references to this work indicate the marginal sections in the Selby-Bigge edition of 1902.

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> "That there are no demonstrative arguments in the case seems evident; since it implies no contradiction that the course of nature may change, and that an object, seemingly like those which we have experienced, may be attended with different or contrary effects. May I not clearly and distinctly conceive that a body, falling from the clouds, and which, in all other respects, resembles snow, has yet the taste of salt or the feeling of fire? Is there any more intelligible proposition than to affirm, that all the trees will flourish in December and January, and decay in May and June? Now whatever is intelligible, and can be distinctly conceived, implies no contradiction and can never be proved false by any demonstrative argument or abstract reasoning *à priori*." (*Enquiry*, Sect. IV, § 30. Cf. *Treatise*, *loc. cit.*)

Any further doubts about the doubtfulness of this principle which is the main-spring of inductive inference are quickly disposed of. No one who understands the principle with its reference to unobserved instances will suggest that it can be simply observed to be true. It is still true that one cannot observe the future, or the unobserved generally. And, finally, no one who has a sound logical conscience and appreciates the indispensability of the principle to induction generally will tolerate the suggestion that the principle may be established by inductions from experience. Such a process would be circular.

> "It is impossible, therefore, that any arguments from experience can prove this resemblance of the past to the future; since all these arguments are founded on the supposition of that resemblance."

And again:

> ". . . all our experimental conclusions proceed upon the supposition that the future will be conformable to the past. To endeavour, therefore, the proof of this last supposition by probable arguments, or arguments regarding existence, must be evidently going in a circle, and taking that for granted, which is the very point in question." (*Enquiry*, Sect. IV, §§ 32, 30.)

On this point the *Treatise* (*loc. cit.*) and the *Abstract* speak with one voice. One final quotation from the latter may serve to summarise the conclusion.

> "'Tis evident that *Adam* with all his science, would never have been able to *demonstrate*, that the course of nature must continue uniformly the same, and that the future must be conformable to the past. What is possible can never be demonstrated to be false; and 'tis possible the course of nature may change, since we can conceive such a change. Nay, I will go farther, and assert, that he could not so much as prove by any *probable* arguments, that the future must be conformable to the past. All probable arguments are built on the supposition, that there is this conformity betwixt the future and the past, and therefore can never prove it. This conformity is a *matter of fact*, and if it

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> must be proved, will admit of no proof but from experience. But our experience in the past can be a proof of nothing for the future, but upon a supposition, that there is a resemblance betwixt them. This therefore is a point, which can admit of no proof at all, and which we take for granted without any proof." (*Abstract*, 1938 ed., p. 15.)

All inductive inferences about the future depend for their validity upon a fundamental principle which, it now turns out, we have not the slightest reason for believing to be true but which nevertheless we simply take for granted. We have, accordingly, no reason for believing any of these inferences; they are all a matter of custom or habit, or, if one prefers more recent terminology, of " animal faith ".

III.

It would be more promising in respect to logical neatness and precision for one to consider the alleged circularity of all inductive procedure, which is the central point of the above argument, while using as a test case some specific scientific law or principle rather than some affirmation as vague and imprecise as that the future will resemble the past. But, for the purpose of analysing the sceptic's views and meeting the arguments by which these views have been defended, such a procedure would have this deficiency, that no matter what specific scientific generalisation were chosen, one reply which would be sure to be made would consist of an appeal beyond this generalisation to some general beliefs about uniformity, some general Principle of Uniformity which, it would be urged, is assumed somehow in the inductive establishment of this and other scientific generalisations. Since the sceptical argument has been presented in terms of general Principles of Uniformity, and it is in these terms that it is alleged to demonstrate the logical circularity of all inductive reasoning, it seems worth while to attempt to deal with this argument, if one can, in the same terms—in terms of some alleged Principle of Uniformity for which it has been claimed in recent philosophy that it does serve as a wide and basic inductive assumption.

In his *Treatise on Probability*, J. M. Keynes attempts to formulate a set of principles which, if assumed to be true of a given area of subject-matter, would justify, in accordance with the principles of probability, the employment of inductive methods in that area. One of the principles which he discusses, the simplest and at the same time the one for which it seems, at first view, most plausible to contend that it may serve as a broad inductive assumption, is the one to which he gave the name of the " Principle of the Uniformity of Nature ". This Principle

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affirms that nature is uniform in a specific way; and that is in respect to position in space and time. "It involves", writes Keynes, "the assertion of a generalised judgment of irrelevance, namely, of the irrelevance of mere position in time and space to generalisations which have no reference to particular positions in time and space" (p. 226. *Cf.* also pp. 255-256, 263, 276). It is this principle, he argues, which

> ". . . supplies the answer, if it is correct, to the criticism that the instances, on which generalisations are based, are all alike in being past, and that any generalisation, which is applicable to the future, must be based, for this reason, upon imperfect analogy. We judge directly that the resemblance between instances, which consists in their being past, is in itself irrelevant, and does not supply a valid ground for impugning a generalisation" (p. 256).

It is, however, difficult to interpret this so-called Principle in such a way that it makes a statement which is both definite and is not at the same time refuted in some areas of experience. Keynes observes that what this Principle affirms is "that the same total cause always produces the same effect" (p. 248), and this is so; but the difficulty here is that of giving a definite meaning to the important adjective "same" as it applies to causes and effects. Unless there is a specifiable meaning applicable to causes in all fields, the formula "same cause—same effect" is not a univocal principle affirming the presence of a specific kind of uniformity in every area of natural phenomena. Yet, when one sets out to specify just what kind of sameness is meant when this formula is employed, one discovers that there is a great variety of interpretations of this word in different fields of inquiry, and that what determines whether a given set of circumstances is regarded as the same cause, for example, varies from field to field, depending upon the nature of the subject-matter as that is revealed in the various generalisations which are regarded as established for that subject-matter. These generalisations exhibit among themselves great differences in scope and precision, as well as in the degree of confidence with which they are accepted. They include, for example, the generalisations about the coherence and constancy of properties which are involved in our belief in and distinctions among various kinds of material objects. And they include the more precise generalisations, frequently expressed in the form of mathematical equations, which would normally be referred to as "scientific laws", as well as the broader generalisations formulated in various accepted Principles and Theories. When this is understood, when one sees that in the employment of the Principle of Uniformity what

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determines the kind of sameness to which the Principle affirms that differences in mere position in space and time are irrelevant is the specific generalisations, the laws, principles, and so on, which have been established in that field, one is in a better position to understand this so-called Principle and its alleged employment as a general inductive assumption. In any given field the Principle of Uniformity states that mere differences in space and time are irrelevant in just this sense, that there are certain generalisations, true of this field, which describe the conditions under which certain objects exist and events occur, and in which differences in mere position in space and time make little or no detectable difference. That this is so, accordingly, is not an inductive assumption in that field in the sense that it is specified and made before all inductive inquiry in the field. It is an inductive assumption in the more usual sense that conclusions of previous experience and inquiries are available for employment in any field as bases for further investigation in that field.

The primary purpose here is not to elucidate and specify the variations of meaning which such a Principle or formula must undergo if it is to be understood as applying to the great variety of fields in which inductive inquiry is carried on, to the great variety in the kinds of uniformity which the generalisations in these fields describe. The primary purpose is to inquire whether the sceptics are right in insisting that it is impossible to provide genuine evidence for beliefs about uniformity, or whether, on the contrary, it is possible to furnish empirical evidence for these beliefs which, in its employment, does not involve circular reasoning. It is granted that what the Principle of Uniformity affirms in any field, if " Principle " it may be called, is that there is uniformity in that field in this sense and no other ; that there are certain specific generalisations which apply to that field and in which mere differences of position in time and space are regarded as irrelevant. In the light of this interpretation of uniformity the question briefly is, how can such a broad affirmation be confirmed or verified by induction without circularity ?

IV.

For purposes of simplicity, in order to secure the clearest statement of the argument in the fewest words, it will be useful in what follows to abbreviate the statement of this Principle of Uniformity and also to consider it only in reference to time. If it can be shown that what the Principle affirms concerning the irrelevance of time in specific generalisations can be confirmed inductively, it can also be shown in exactly the same way tha

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it is possible to confirm the Principle in its spatial reference also. So abbreviated and restricted, the Principle asserts that, in the specific way just defined, differences in time make no difference. Can this interpretation of the assertion that the future will resemble the past be confirmed ? What, if any, is the evidence for it ?

It follows directly from the interpretation which has just been given of this principle what the evidence for it must be. If the Principle affirms no more for any given area of fact than the validity in that area of certain generalisations which are uniform with respect to space and time, then the evidence for the Principle must be whatever evidence there is for these particular generalisations. This includes all the observations in the past and present which confirm the presence in that area of the uniformities of which these general statements speak. Belief in the uniformity in a given area is not something which is specifiable apart from the laws, principles, and other generalisations regarded as established in that area, but is itself belief in just the kind of uniformities which these generalisations describe and define. If it is correct, then, to say of any generalisation, *e.g.* of any scientific law, that it is confirmed or verified by empirical evidence, is it not correct to say that, to that extent, there is evidence for belief in the uniformity of nature ?

The sceptic's answer to this question repeats that final rejoinder of Hume. Granted that there is empirical evidence which has been used to establish various scientific laws, all that it is evidence for, he insists, is the assertion that *in the past* these laws were true, that in the past differences in time have made no difference. This evidence is absolutely worthless for inferences which speak about the future unless it is possible to assume that the future will be like the past. But stop ! That is part of what one is trying to show, that is, that mere differences in temporal position, whether past or future, make no difference in these laws of nature. That the future will be like the past means, among other things, that in the future these laws will hold, that in this specific respect differences in time will make no difference. This cannot be inductively confirmed, the sceptic is saying, because any inductive argument for it assumes it and is therefore, as evidence, completely valueless.

One major source of the plausibility of the sceptic's reasoning lies in the analogies which knowing the future easily suggests and in terms of which one is apt to think and be misled. Is this not, one may ask, like any case of sampling ? And must one not take care, when reasoning inductively from samples, that

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one's samples are fair? If a scientist reasons concerning the behaviour of oxygen, nitrogen, or hydrogen on Mars, if such elements there be on Mars, on the basis of the known behaviour of these elements on the earth, he is assuming that in some respects the samples of the elements on the other planet are like those we have here. Similarly in reasoning about the future behaviour of these elements on the basis of present and past behaviour one must assume that future samples of these elements will be like present and past ones. Now if it is the case that past samples may be regarded as evidence about future ones only upon such an assumption, then no examination of past samples, however extensive, can be regarded as yielding evidence for the assumption itself. Any reasoning which did attempt to employ such samples as evidence for the assumption would be forced to use the assumption as a principle in the reasoning and would therefore beg the whole question at issue.

A physical representation of the kind of analogy presented here might be as follows: Suppose that there was somewhere in the world an enclosure beyond which it was impossible for anyone ever to go or to make any observations. Nothing could be seen, heard, or in any other way perceived beyond the border. The territory beyond the enclosure, forever barred from human perception, is the land of Future. The territory within the enclosure is the land of Present and Past, but since it is overwhelmingly the latter, it all goes under the name of Past. Now suppose that someone within the enclosure is interested in some proposition about the way things behave beyond the enclosure, say, a simple and homely proposition about chickens, to the effect that beyond the enclosure roosters fight more than hens. And he wonders what evidence, if any, there is for this proposition. Of course he cannot observe this to be true. He must base it upon his observation in the land of Past; and if he does base it upon the observed fact that roosters in the land of Past fight more than hens, he must assume that in this respect chickens beyond the enclosure behave like chickens within it, so that, knowing that in the latter area roosters are the more pugnacious, he may employ this knowledge as evidence that things are this way also in the former area. This is an assumption which no empirical evidence, confined as it must be to evidence in Past, can be employed to support. Any attempt to support it with such evidence must itself assume that in respect to the phenomena involved differences between Past and Future are negligible; and since that is exactly what the reasoning is attempting to establish, the process is patently circular.

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This is the kind of metaphor which makes friends, and influences people, in this case, to draw the wrong conclusions. There are several faults in the analogy. The chief one is that, as represented, the border between Past and Future is stationary, while in the temporal situation it is not. To duplicate the temporal situation in this respect the analogy should represent the border as constantly moving, revealing as it does constantly, in territory which has hitherto been Future, hens and roosters similar as regards difference in disposition to those already observed in Past. The matter of evidence for the proposition about hens and roosters is then also different. If this proposition is in a position analogous to the beliefs about uniformity which are represented in modern scientific laws, the situation is something like this. Previously inhabitants in Past had drawn more sweeping conclusions concerning the difference between the disposition to fight of male and female chickens. They have discovered recently that in respect to young chicks and pullets this generalisation did not hold. They have therefore revised the proposition to exclude all the known negative instances and speak only and more surely of the behaviour of hens and roosters, meaning by these latter terms just fully grown and developed female and male chickens.

So far as there is any record, chickens in Past have verified this rule ; so far as there is any record, every chicken revealed by the ever-receding border has likewise verified it ; so far as there is any record there has not been one negative instance. Is it not the case that the inhabitants of Past do have evidence for the proposition that all chickens obey this rule, those already in Past, which they call " Past-chickens ", and those also which are not yet in Past but which will be subsequently revealed by the moving border, and which they call not unnaturally " Future-chickens " ? They have a vast number of positive instances of the rule, and no negative instances, except those in respect to which the rule has already been revised. In view of the present evidence that in all cases, year after year and century after century, the progressively revealed chickens have verified and do verify this rule, must one not conclude that the inhabitants of Past do have evidence for this proposition, and that anyone is wrong who says that they have actually no evidence one way or other ?

The sceptic, however, is still prepared to argue his case, and his argument, in terms of the present analogy, has a now familiar ring. That the inhabitants of Past have no evidence whatsoever about the behaviour of Future-chickens, he will insist ; and

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as grounds he will point out that although the border does progressively recede and reveal chickens like those previously observed in Past, these are really not Future-chickens. By the very fact that they have been revealed they are no longer Future-chickens, but are now Past-chickens. Observation of them is not observation of Future-chickens, and any attempt to reason from such observation to conclusions about Future-chickens must therefore assume that Future-chickens are like Past-chickens. For the inhabitants of Past, in these efforts to know the land beyond the border, this is both an inescapable and unknowable presumption.

What should one say of an argument of this kind? Only through some logical slip, one feels strongly, would it be possible to arrive at such a conclusion. One would have thought that the receding border was a matter upon which the inhabitants of Past may legitimately congratulate themselves in the light of their interest in learning what Future-chickens, when they become Past, are going to be like. If the border had not yet begun to recede they would indeed be in an unfortunate position for securing such knowledge. But happily this is not the case. The border is constantly receding. And granting that it will constantly recede, revealing always more of the land of Future, and even granting also that this means that there is an inexhaustible area to be revealed, the inhabitants of Past are in the fortunate position that with the progressive recession they may learn more and more about chickens, Past and Future. They may derive hypotheses from their experience of what has already been revealed and proceed further to test these by the progressive revelations of Future, in the light of which they may be confirmed, refuted, or revised. The sceptic's argument amounts to the assertion that all this apparent good fortune is really illusory and that the sorry Pastians are actually in no better position with respect to knowing about Future-chickens and Future-things generally than they would be if the border never moved at all. For the movement of the border does not reveal Future-chickens, since Future is by definition the land beyond the border. No matter how much or how little is revealed, by the very fact that it is revealed and on this side of the border it is not Future but Past, and therefore, since the land of Future always is beyond observation, no empirical method can produce any evidence that what is in that land is in any way similar to what is not. That this rendering of the sceptic's position, though in the language of the above metaphor, is undistorted and fair may be seen by consulting the words of an illustrious modern sceptic and follower of Hume,

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Bertrand Russell. In his chapter, " On Induction ", in *The Problems of Philosophy*, Russell expressed the matter in this fashion :

> " It has been argued that we have reason to know that the future will resemble the past, because what was the future has constantly become the past, and has always been found to resemble the past, so that we really have experience of the future, namely of times which were formerly future, which we may call past futures. But such an argument really begs the very question at issue. We have experience of past futures, but not of future futures, and the question is : Will future futures resemble past futures ? This question is not to be answered by an argument which starts from past futures alone. We have therefore still to seek for some principle which shall enable us to know that the future will follow the same laws as the past " (pp. 100-101).

This is the central difficulty urged by Hume, Russell, and others in arguing that there can never be any empirical evidence that the future will be like the past. Empirically, in Russell's language, it is possible to have evidence only that this has been true of past and possibly present futures, not that it will be true of future futures. It is the situation in the land of Past all over again. There are generalisations which are constantly being confirmed by experience. But every time a confirming instance occurs it is nullified as evidence by the argument that it is not really a confirming instance at all. For by the fact that it has occurred it is an instance of a past future, and therefore it tells nothing whatever about future futures. In treating of the land of Past it was suggested that there is involved in arguing in this manner a logical slip or error. It remains to investigate how this is the case.

V.

Suppose that in 1936, to take but a short span of time, a man says that in the above-defined sense the future will be like the past. In 1936, if he could somehow have shown that 1937 would be like 1936, this would have been evidence for his statement, as even a sceptic would admit. But in 1937, when he does establish that 1937 is like 1936, it has somehow ceased to be evidence. So long as he did not have it, it was evidence ; as soon as he gets it it ceases to be. The constant neutralisation of the evidence which is effected in this argument is effected by the same kind of verbal trick which children play upon one another in fun. Child A asks child B what he is going to do to-morrow. B replies that he is going to play ball, go swimming, or what not. Thereupon A says, " You can't do that ".

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B: Why not?

A: Because to-morrow never comes. When to-morrow comes it won't be to-morrow; it will be to-day. You can never play to-morrow; you can only play to-day.

Again, if a prophet announces that next year will bring a utopia, and if each succeeding year, when the predicted utopia does not come, he defends himself by pointing out that he said "next year" and that obviously this is not next year, no reasonable person would pay much attention to him. Such a person would realise, on a moment's reflexion, that the prophet is being deceptive with the word "next". In 1936, "next year" means "1937"; in 1937 it means "1938". Since every year "next year" means a different year, a year yet to come, what the prophet says can never be verified or disproved. If in 1936 he meant by this phrase 1937, as he sensibly should, then this statement can be verified or refuted in 1937. But if, when 1937 comes, he insists that he did not mean 1937, but "next year", and if in 1938 he again insists that he did not mean that year, and so on, then what he seems to be meaning by "next year" is the $n + 1$th year where n is the ever-progressing number of the present year. No one should alter his present activities or his plans for the future on the basis of such a prediction, for, of course, it really is not a prediction. While in the form of a statement about the future it does not say anything about the future, anything which could possibly be true or false in the infinity of time, if infinity it is, which yet remains to transpire. For what the prophet is saying is that utopia will come next year, and by his own interpretation of the words "next year" he is affirming that next year will never come. In other words, at the time which never comes, and hence when nothing occurs, a utopia will occur. This is not even sensible speech; it is a contradiction.

In a similar though less simple way those who employ the sceptical argument about uniformity to show that there is no evidence whatever for any statement about the future are being themselves deceived and are deceiving others by their use of expressions like "next", "future", "future future", and "past future". The man who said in 1936 that the future would be like the past, that mere differences in temporal position make no difference in the behaviour of nature which is described in scientific laws, meant, as he sensibly should, that this was true of the years 1937, 1938, and so on. He said something of the form "all A's are B's" and it has been possible since 1936 to examine the A's of 1937 to 1946 and to see whether what he said is con-

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firmed or disproved by the available evidence. If, however, now that it is 1946, and all this evidence is in, he should remark that since it is 1946 the years 1937-46 are no longer future and therefore have ceased to be evidence for the proposition, then he is guilty of using, or rather abusing, the word " future " in the way in which the prophet in the previous example was abusing the word " next ". For the only basis for his contention that the observed *A*'s are not confirming evidence, or what is the same thing, that they are confirming instances only if one assumes quite circularly that the future is like the past, is in his illusive use of the word " future ". Time does pass, and, because it does, the present is a constantly changing one ; and the point of reference for the use of words like " future " and " past " is accordingly different. The correct conclusion to be drawn from the fact that time passes is that the future is constantly being revealed and that, in consequence, we have had and shall have the opportunity to learn more and more accurately what the laws of nature's behaviour are and how therefore the future will be like the past. But this sceptical man has his eyes fixed in fatal fascination upon the movement of time, the constantly changing present. And seeing that, as the present changes, what was once future is not now future, but present, and will shortly be past, he is led to draw the conclusion that after all, for any present whatever, the future is forever hidden behind a veil.

Now in a sense this is true, and in a sense it is not. And it is the confusion of the two senses which makes the trouble. The one sense, the kind of future which is forever hidden behind the veil of the ever-moving present, is not the kind of future of which this man began to speak. The kind of future of which he began to speak was the future of 1937, 1938, and so on ; the kind of future years or futures which do become present and then past. This kind of future is constantly being revealed ; in this sense of " future " the *A*'s of 1937 to 1946 are positive instances confirming our beliefs about scientific uniformity. But the sceptical man, although under the impression that he is still talking about the future in this sense, the sense of things which have not yet happened but which may happen, is actually talking about the future in the other sense ; at least he is saying things which are true only if the word is interpreted in this other way. That is why he is deceived. He is unaware that the meaning of the word has changed. He thinks when he asserts that there is no evidence that the future will be like the past, and that all one has evidence for is that past futures have resembled their

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pasts, that he is using this crucial word in the way in which he began, in the way people are constantly using it to make sensible observations about the next and future months, years, and so on. But he is not using it in this way, and the key to this particular puzzle about knowledge of the future lies finally in realising that he is not. Like a prophet who says that a utopia lies around the next corner, a corner which, no matter how many corners we turn, and no matter how many utopias or hells on earth we find in turning, is still the next corner, like him the sceptical man is talking about a future which by definition will never come. In this sense of the word the statement that the future will be like the past no longer means, as it originally did, that the years, or rather events in the years 1937, 1938, and so on, have a certain characteristic. It means instead that in a future which is always future, in years which never come, events will have this characteristic. In short, he is now saying that at a time which never comes differences in time will make no difference, that at a time when no events occur (for if they did it would be present and not future) certain types of events will obey certain fairly uniform laws.

There are then, two senses of the word " future " to be carefully discriminated. They may be designated future-1 and future-2. In the sense of future-1, when one speaks about the future he is speaking of events which have not occurred, of things which do not exist, but of events and things which, with the constant movement of the line of the present, may sometime occur or exist. In the sense of future-2 when one speaks about the future he is speaking of the time which is always beyond the line of the moving present, of a time which never comes, which by definition can never come, no matter how far the line of the present moves.

Interpreted in the sense of future-1 there are beliefs about the way the future will be like the past, which have been and are being confirmed constantly by the uniform experience of countless positive instances in everyday life and in vast areas of science. Because they have been thus confirmed they constitute a vast set of assumptions with which scientists and laymen approach their problems in the various areas to which the confirmation applies. It is when these beliefs are interpreted in the sense of future-2 that the sceptics are able to produce a plausible argument to show that these beliefs are not empirically confirmable and are hence unknowable. But, when these are so interpreted, the argument has no bearing whatever, favourable or unfavourable, upon the soundness or success of any inductive inquiry. It asserts that specific types of events occur in specific ways, not

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in 1945, 1955, or any other year which will ever come, but in a year and a time which will never come. That one cannot produce empirical evidence for the statement that at a time which never comes and when no events occur, events will occur in these rather than other ways, may be readily admitted. But this is no good reason for scepticism. No scepticism is entailed by this admission so long as it is made with the understanding that there is evidence about the other kind of future, the kind which will come and in which events do occur. And it is this latter kind of future only, of these two kinds, with which our inductions are concerned. It is this kind of future alone about which our inductions predict, and this kind alone which will ever confirm or refute our assertions. It is, therefore, not sensible for anyone to worry, in his inductive reasoning, about the character of a future which by definition can never come, about his incapacity to prove that if this future did come, which is itself a contradictory condition, it would have this or that character. And no one would worry about such a thing for an instant unless misled by fallacious reasoning such as that which has just been exposed. No one, for example, in the present international puzzlement or uncertainty, wastes a moment worrying about the kind of future wars, future-2 wars, which by definition cannot happen. The kind of future wars which one does worry about and is concerned to prevent is the kind which may come, which can occur in some present. And just as a future war which by definition cannot occur is not a future war in any sense which is pertinent to our present international deliberations, so generally a future event which by definition can occur in no present is not a future event in any sense which is pertinent to the validity of our inductive reasoning beyond the present and past, either in science or in everyday life.

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