Memory

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Mind, New Series, Volume 51, Issue 201 (Jan., 1942), 47-68.
III.—MEMORY.

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It is the purpose of this paper to consider the trustworthiness of memory. This branch of cognitive experience seems to have suffered some neglect at the hands of logicians.

The ordinary man holds that at least some of his memories seem so compelling in their information that it would be scepticism run mad to challenge their credentials. But this very intolerance of doubt should put the logician on his guard. Overweening assurance in cognitive matters is always suspect.

It is important to distinguish two problems with regard to the cognitive nature of memory, although they are inter-related.

(1) Is the information conveyed in memory a matter of certainty or only of opinion? Ordinary men and many philosophers would join in holding that at least some memories give certainty. An argument will be developed against the absolutely indubitable character of any memory.

(2) There is the more subtle question whether the memory tells its own story; whether, that is, we can trust implicitly in it as and when it occurs without seeking the support of further experience before giving it full confidence. Do we trust memory because there are reasons external to it for doing so, or is it, so to say, self-authenticating?

Here again the ordinary man would make, on behalf anyhow of some of his memories, a plea that they are self-authenticating. That I entered this room, that I passed along a certain street, have lived in a certain town, been educated at a certain school, been familiarly called by a certain name, these and many things seem so indubitable, as I remember them now, that no further quest for confirmation seems likely to serve a useful purpose. Of course there may be ambiguities in the terms with which these past experiences are described, in the meaning of the words, house, street, school, name and so on. But that I did go through certain experiences, of which the descriptions may give an incomplete definition, nothing can persuade me to doubt.

It is the purpose of this paper to raise such a doubt, and to plead that the opinion that memory is informative is a hypothesis which must take its chance in the rough and tumble of experience along with other hypotheses.
This paper is divided into three parts. (1) There is an analysis of the nature of memory as it presents itself in our experience, which is preliminary to the discussion of its informativeness. (2) There is a brief discussion of the status of various kinds of memory in relation to certainty and opinion. (3) The view that the informative character of memory is a hypothesis is examined, together with the grounds for believing the hypothesis to be correct.

I.

I propose to start from the total present experience of an individual who may in sophisticated language be said to be sitting in a room and to remember having walked along a street. That total experience is shot through with interpretation, inference and opinion. He cannot look at a chair without at the same time thinking of its structure and qualities in a way that is only possible owing to past experiences of similar objects. Since we are inquiring into the validity of memory, it is necessary to make a drastic abstraction and think away all those elements in his present experience which are the result of past experience and inference. Opinions about the external world with its bodies and laws of nature cannot be come by save by that collation of our past and present experience which memory alone renders possible. No validity must be claimed for these opinions while the claim of memory to be truly informative is still sub judice.

The totality of the experience may be divided for simplicity into two parts, the sense-impressions connected with the act of sitting in the room, and the memory of having walked in the street. Each part is itself a whole of parts with a complex structure. There are some resemblances between elements in each structure; each structure contains items with colour, shape, size and so on. These resemblances enable the memory to be distinguished from the non-memory, because each element in the memory that resembles an element in the non-memory differs from its correspondent in a similar way. Thus seeing a red object, say, a cushion, differs from remembering seeing a red object, say a pillar-box, in a way similar to that in which seeing a man standing in the room differs from remembering seeing a man standing in the street, and to that in which having a headache now differs from remembering having had one in the street. This resemblance with a difference would be still more striking if we supposed the person sitting in the room to remember having sat in it on a previous occasion in precisely similar circumstances.
It would be wrong to emphasise the resemblance too strongly. Opinions differ as to whether, when the memory of, say, a sensory experience occurs, the memory is composed of sub-sensory elements each resembling its original in a faded way. Alternatively, it may be that the elements in the memory event are purely symbolic, that when for instance some one having seen several red things comes to remember seeing some red thing, it is the word red and not a faded replica of the colour red that is present in the memory structure. None the less, the relation between the two kinds of red may be present to the rememberer.

Let us now consider the question what information about the world is vouchsafed by the present total experience. What is necessary to give a complete record of it? There are certain sensory elements, coloured shapes, light and shade, internal feelings and so on. It is sometimes said that these are directly known. They are certainly occurring. Whether it adds anything to say that they are “known” seems doubtful. If the record is to be complete, all the shapes and shades and their mutual relations must be set down in detail either on a map or by any appropriate set of symbols. Then the whole structure of the memory with all its terms and relations must be set down, for that is certainly part of the present total experience.

It may be stressed in passing that there is a complex structure in the memory event. It has been argued that this is a mistake; that all the complexity is in the remembered event, and that the memory is a simple unitary act of the mind apprehending a complex. This view is surely untenable. Take the case of a mistaken memory or, should we say, of a state simulating memory, of a street with houses, gardens and traffic. Here the complex must be in the memory event, for there is no remembered event. Will it be said that a genuine memory is less articulated than the state simulating it? Then wherein is the simulation? Again, if there is any truth in our view of the past which we have pieced together, not every detail of a given totality is remembered. The material of the houses may be remembered but not the number of storeys, and so on. The memory event must then be as complex as what is said to be remembered, which is a selection of a total experience, for how otherwise can we say how much of it is remembered? There must be as many terms and relations as there are in what is remembered. And these must be properly disposed in relation to one another. It will not do if the paving stones are on the roofs and the slates in the street. In fact, the memory must be in some sense a copy of the thing remembered. This does not involve the alleged fallacy in the copying theory of
truth, because that theory postulates that the mind is aware of a copy rather than a reality, and so introduces an otiose tertium quid. In this account the memory event is merely said to constitute or contain a copy of what is supposed to be remembered. Finally, to postulate that the structure as a whole is a copy does not prejudge the question whether each element has any sensory similarity to the remembered elements.

In drawing up the record, then, the complex of present sensory elements must be set out and the complex structure of the memory event. Is there anything else in the world which this experience entitles us to record? Must we not also record in all its detail the event remembered? A memory is not identical with the experience remembered. Does this present memory enable us to specify some part of the world lying outside the present totality, namely the remembered event? That is the question to be discussed.

It must be admitted that the differentiation of memory from other parts of a present experience has been rather hastily characterised. Suppose that instead of a memory of walking down a street, there was an imaginative picture of walking down the street. This need not consist of mental images. I may suppose myself walking down a street past a red letter box, the letters R—F—D symbolising that colour in my mind. All that was previously said before about the resemblance with a difference between elements in the memory and elements in the experience of sitting in the room may now be asserted of the resemblance between elements in my imagined excursion and those in the experience of sitting in the room.

In fact, it may be that the clue given by resemblance with a difference does not indicate the distinction between sense experience and memory but between sense experience and a wider range of other experiences including day-dreams and reveries, as well as memories. The difference between these two kinds of experience is directly presented as well as the resemblance of certain components of one class to components of the other. Is it permitted to designate without more ado the difference between these resembling components by calling one lively and the other a faint counterpart?

It is to be emphasised that these terms must not be interpreted literally. In the ordinary sense of lively the memory may be much more lively than the non-memory. For instance, the experience of being in this room that I remember may have been charged by an emotion illuminating the scene with a vivid excitement that even now re-kindles in my memory while I am sitting
listlessly in my chair dead to the world around me. The words are to be taken as terms of art used to distinguish a quality of experience which is directly recognised. Again, this usage must not be taken to imply that the component of memory is a faded image of a sensory experience nor to exclude the possibility that the components of memory are arbitrary symbols somehow representing the remembered elements.

This usage enables us to define shortly the difference between memory and reverie. When what we call a memory occurs, the structure is accompanied by a propensity to predicate liveliness of it, although it is not, in fact, lively in the present totality. This may be regarded as the sole and sufficient characteristic required to distinguish memory from reverie. The propensity may not always be strong; indeed, it may be so weak that its presence is a matter of doubt, there may be an indeterminate borderland between memory and day-dream. This possibility has no tendency to impede the arguments about memory which will be developed.

The foregoing paragraph introduced a sophisticated term. It was said that in memory we have a propensity to "predicate" liveliness of the memory structure. It would be undesirable to introduce such a sophistication at this stage, save by necessity. Could we not simply say that there is a propensity to "conjoin" liveliness with the structure? In the imagination there are many permutations and combinations of elements. Why should not liveliness be an attribute that may be conjoined with others? The answer is clearly simple. If liveliness were conjoined to the memory structure, that structure would not be faint; it would lose the character which by definition it is recognised to have.

Why, it might be objected, should not the faint structure and the same structure conjoined with liveliness exist side by side? But this conflicts with experience, if side by side is used in the sense in which the memory of walking in the street and the lively experience of sitting in the room are experienced as side by side. If the validity of memory is fully admitted, and the lively experience of walking in the street is to be put on the record, it must not be placed on the record alongside the lively experience of sitting in the room, and the memory of walking in the street, but above (or below) the record of those two structures. There is a sense in which sitting in the room and remembering the walk are alongside, and remembering the walk and performing the walk are not, although these last mentioned may be regarded as alongside each other in their own different way. A two-dimensional surface provides a convenient medium for symbolising these mutual relations.
If, however, we set alongside the lively experience of sitting in the room the faint counterpart of a walk in the street and that only, we have omitted something that is also alongside the lively experience of sitting in precisely the same sense that the faint counterpart of a walk is alongside it, namely the tendency to predicate liveliness of the walk structure. Hence, it is quite clear that the predication of liveliness of a structure is to be distinguished from the conjoining of liveliness to it. It is not to be supposed that liveliness was conjoined to the walk in the street twice over; one such conjunction is already represented above (or below) the experience of sitting in the room; it is impossible to place another alongside it; yet the record of the faint counterpart of a walk is insufficient. Some such notion as predication must therefore be accepted as necessary to an adequate record of all that occurs alongside the sitting in the room.

It is sometimes said that we have direct knowledge of the data which occur in a sensible experience; e.g., that we know that that red patch is square. Such a form of words may have meaning, though I must confess that I have never apprehended what it is. What at least is clear is that the knowledge constituted by the predication of liveliness of the walk structure, if indeed that predication is finally held to be valid, is totally different from the so-called knowledge that that red patch is square. The view that knowledge is properly employed in both cases cannot be saved by saying that they are different species of a cognitive relation. It is of the essence of a sensible experience of a red square patch that red and square are, in fact, conjoined within the experience, whereas it appears to be of the essence of the predicating experience just described that liveliness and the walk structure are not so conjoined. What two kinds of experience could be more opposed? It may be said that the predication does in a sense link liveliness to the walk structure. But this link is different from and inconsistent with the kind of link or conjunction which happens when a lively walk happens or a red square patch is experienced. And it is just because of that difference that we had to introduce this novel concept of predication. Where the conjunctions of nature end, those of knowledge begin.

In the description of memory here set forth, no mention has been made of the past. This need not be introduced as an additional ultimate concept. We have already seen that the lively walk, if it exists, is not alongside the lively sitting, the faint counterpart of the walk or the propensity to predicate liveliness of the walk structure in the sense in which those three
experiences are alongside each other. The past may be defined simply as the Lebensraum of the lively walk. If the propensity to predicate involved in memory did not vouch for the existence of a lively counterpart, no meaning would be left in the idea of a past.

The chain of past events of which we commonly think can be constructed with the aid of memories. Thus, if the memory of A is remembered as part of an experience of which lively B was an ingredient, lively A has to be represented further above (or below) the present than B.¹

II.

Memory has been distinguished from imaginative reverie by inclusion of a propensity to predicate. In some cases, it may be said, or, according to one idea, in all cases, there is an actual predication. It is consistent with the foregoing arguments to make propensity to predicate cover the case of actual predication, when that occurs, or even to substitute actual predication for propensity to predicate. It might be said that the remembering state may either be one of certainty or of opinion. Or, alternatively, it may be asserted that it can only be one of certainty.

It is not necessary to argue about terminology. Some would hold that when a man says “I remember X” he ought to mean “I know X”, and that when his state is one of opinion only he ought to say “I think I remember X”. The significance of both states requires logical scrutiny.

According to the ordinary view, even when there is some doubt in the mind, the memory is not wholly lacking in cognitive character. When a man thinks he remembers something, it is supposed that in many, though not all, cases that something happened. The frequency of occurrence may be roughly correlated with the strength of the opinion. Even when the propensity is very weak, if on the occasions of such weak propensity occurring, the event has sometimes happened, the memory is not without cognitive significance. For since the event remembered is usually even in the simplest cases highly complex, e.g. the configuration of the street down which I walked, it is very improbable that such a memory should correspond to a lively event by chance.

Turning now to the narrower class where there is no question

¹ Of course sophisticated man peoples the past with many events of which he has no memory; but then he also peoples the present with many events of which he has no direct experience.
of doubt in the mind, we have to consider the view that all memories claiming to be certain are indeed so. Is there a class of memories, distinguishable from memory-opinions when they occur, of which it is possible to say that if one of this class occurs the remembered event happened? But is it not the case that memory often plays us tricks? Some may be disposed to rebut this count against memory by distinguishing even in the class where there is no explicit doubt between memories and memories. There is the casual fleeting memory, or, as it may be called, the state which simulates memory, and there is the assured feeling of certitude on which after full reflexion and deliberately testing every manner of doubt we are prepared to take our stand.

This rebuttal is not altogether satisfactory. There is an awkward suspicion that the clearly marked boundary that one would expect to delimit something so absolute as knowledge is lacking. It would probably have to be admitted that some people are quite incorrigible and incapable of applying sufficient tests to their own prima facie feelings of assurance. Is certitude to be confined to a small band of apostles of righteousness? And is it not rather dubious to suppose that the cognitive character of an experience changes in kind correlative with the increase in the degree of a psychological concomitant, attention?

Again, this point of view seems to relegate too much to the scrap heap. It safeguards the validity of the small class of elect memories. But is there not much to be learnt from those experiences which, since they cannot be implicitly relied on, are by this account merely states simulating memory? They are, indeed, often misleading, but we should be hard put to it if we had to guide our lives without their aid.

At this point we may summon to the assistance of memory the fact, which cannot be challenged, that it is only on the basis of opinions which depend on trust in some memories that we can say that memory ever plays us tricks. The more sure we feel that seemingly reliable memories are sometimes wrong, the more reliance do we thereby place on the view that a great many memories have been correct. If it could be shown that all memories subsequently judged misleading could be placed at the time of their occurrence into the inferior class of mere semblances, then this argument would do much to vindicate the validity of memory. But it is by no means certain that the misleading memories can always be detected as inferior at the time of their occurrence.

It is quite true that if we are completely sceptical with regard to the validity of all memories, we shall have no grounds for
condemning some as misleading. But this does not save us from an awkward dilemma. Let A, B, C . . . X be a series of facts vouchsafed by memory, of which X is presented with equal assurance but inconsistent with the others. Our natural disposition is to accept A to W but to reject X. Now if our unwillingness to accept X impugns the validity of memory itself, we have no specific grounds for rejecting X, since we can no longer take A, B, C, etc., as true. None the less, the inconsistency of X with the others does give grounds for impugning memory. The proposition that memory is valid entails A to X. But X is inconsistent with A—W. The only way out of this dilemma is to reject the proposition that memory is valid. Then there is no inconsistency; we have no grounds for believing that either A—W or X are true, though either, but not both, may be.

This conclusion is not unavoidable. For the rejection of X on the grounds of A—W implies some intermediate general proposition about the nature of the world, unless at least X is the direct negative of one of the memories A—W, and it is not necessary to suppose that memories which directly contradict each other ever exist together. Thus I may have a large number of reliable memories which imply that a friend died last month. X may consist of a memory which seems equally reliable that I met him in the street yesterday. The intermediate proposition is that it is impossible to meet a man in the street who died a month ago. But this is not necessarily so. We have only to revise our ideas sufficiently about what is possible in the world to make all memories reconcilable. In fact, we are not willing to do this, and prefer to reject a memory, even though it has the highest degree of cogency ever experienced when it occurs, rather than make a radical revision of our ideas of the order of the universe based on a large number of other memories.

All these difficulties and inconsistencies may be overcome by a simple revision of the definition of the cognitive nature of memory even of the highest status. For the proposition that, when a memory of the highest status occurs, we know that a lively counterpart of its content has occurred, it is only necessary to substitute the proposition that when a memory occurs, it is probable that a lively counterpart of its content, or something similar to it, has occurred.

This substitution has the following advantages:—

1. It destroys the necessity for having a rigid and unplausible boundary line between memories proper and states simulating memories.
2. It is consistent with some vagueness about the distinction between memories and day-dreams or dreams.

3. It justifies our propensity to reject a memory, even if it appears to have the highest reliability when it occurs, rather than reconstruct our view of the universe based on many other memories.

4. The misleading character of a memory, even of the highest status, no longer undermines the reliability of memory generally.

5. It seems reasonable to expect to find correlation between the degree of reliance which the subject is disposed to place upon a given memory and the frequency with which other evidence, when that is available, points to the lively content having occurred; and this correlation is, in fact, found.

6. It also seems reasonable to suppose that in certain cases the probability vouchedsafed by memory is so high as to be approximately equivalent to certainty.

It is to be noticed that this revised definition requires some change in widely accepted views about the nature of direct knowledge. It is usually held that the data supplied by direct knowledge are matters of certainty, and that probability only attends the inferences drawn from them.\(^1\) It is now claimed that the proper way of recording certain data provided directly by our experience without the aid of reasoning is to state that an event of a certain composition may have, or is likely to have, occurred. Memory is, in fact, held to be informative, but not infallible. It is an example of a direct cognitive relation, but lacks certainty.

This view overcomes the difficulties due to the existence of misleading memories, it harmonises with what we believe about the working of other parts of the natural order, and, if prejudices arising out of traditional logic can be overcome, it should appear sensible, and even intellectually satisfying.

But though the view is sensible enough, it is still necessary to ask whether there are any grounds whatever for holding it. What reason have we for supposing that memory is informative at all? This is the crucial question.

\(^1\) Cf. the first sentences in *A Treatise on Probability*, by Mr. J. M. Keynes. "Part of our knowledge we obtain direct; and part by argument. The theory of Probability is concerned with that part which we obtain by argument."
III.

It may be objected that this is pushing Cartesian scepticism too far. Everyone will be able to think of events for which memory seems to vouch with such absolute assurance, that he will be entirely impatient of any doubt. To question his convictions may seem to him to be degrading philosophy to a futile game. Or he may put it: "It is necessary to begin somewhere; these memories seem to give the greatest degree of assurance man has ever had about anything, or ever hopes to have; if you do not build on them, you will never find anything upon which you can build; if you are determined to believe nothing, you need not; but then you had better leave the constructive tasks of philosophy to others whose minds are not eroded by this childish negativism".

To this plea of common sense, the logician must, I fear, present a stern opposition. Within the present totality there is a structure of faint elements, of which there is an overwhelmingly strong propensity to predicate liveliness. But can this propensity serve instead of a good reason? The propensity might exist, and yet there might, in fact, never have been such a lively structure. The existence of the propensity to predicate cannot be said to entail the existence of the lively structure, or even to entail that the lively structure probably existed.

This clash between common sense and logic having been set forth, it seems impossible to proceed further along this path. Philosophical discussion would soon give place to acrimonious argument.

It seems expedient, therefore, to approach the matter from an entirely different point of view by abandoning completely the self-authenticating character of memory. Let us suppose instead that the view that memories are informative is a mere hypothesis. Is it possible to find verification for it? In answering this, we must remember the position of primitive ignorance with regard to the nature of the world from which this inquiry began. (The hypothesis is that memories are informative only; there will be no further reference to the view that memories are infallible.)

How is support to be found for the hypothesis? Since memory is sub judice, and almost all, if not all, that is alleged to be known now is only known on the assumption that the information supplied by memory is correct, this support may be hard to find. The only procedure open to us appears to be to make predictions on the basis of the hypothesis that memory is informative and test the hypothesis by their success or failure.
What is the nature of a prediction? Like memory, prediction predicates liveliness of a given structure, although within the present totality the structure is not, in fact, lively. What is the difference between memory and prediction?

There may be a desire to distinguish between them by asserting that memory is direct knowledge and prediction inferential. This, however, will not do, since some inferential judgments predicating liveliness of faint structures relate to the past and prediction is supposed in sophisticated language to refer to the future. What is this future?

It has already been shown how memories enable a chain to be constructed terminating in the present totality. This is the case whether their supposed validity is chimerical or not. Is it possible to suppose quite simply that it is within the scope of imagination to continue this chain, thus providing a Lebensstrauem for the lively contents of predictions? Perhaps the process is a little more roundabout. It is clear that in the imagination various elements of experience may be combined. In memory we have experience of many lively counterparts being accredited to faint contents. By a simple process of analogy or extrapolation a faint counterpart of the lively content of the present totality may be imagined. But where? If a lively structure B is remembered as occurring simultaneously with the memory of A, lively B comes on the chain between lively A and the memory of B. For B in this proposition write a present lively experience. This experience must come, therefore, between lively events now remembered and the supposed memory of the present experience. And so an extension of the chain is postulated on the side of the present opposite to the past. This extension of the chain which contains the imagined memory of the present is called the future, and on it room may be found for the lively contents of predictions.

It still remains to consider how a prediction may be distinguished from a memory at the time of its occurrence. It may suffice to say that the propensity is to predicate liveliness of the present faint structure on a part of the chain on which a memory of the present is imagined as possible. Indeed, the prediction may itself be remembered at the same time that it is fulfilled; if this is imagined when the prediction occurs, it follows at once that the conjunction of liveliness with the structure in the prediction is predicated to occur in the future in the sense defined in the foregoing paragraph.

Prediction rests on two fundamental hypotheses, namely (i) that the assertions of memory are informative, and (ii) that
things which have remained similar for some time are likely to continue to do so. The possibility of verifying a prediction rests on the hypothesis that memory is informative, for unless the memory of the prediction being made which accompanies the fulfilment of the prediction is informative, there is no reason to suppose that the content of lively event M when it occurs resembles the content of any prediction. If, when lively M occurs and I simultaneously remember prediction M, there is no probability that prediction M occurred, the occurrence of lively M cannot be held to confirm any prediction.

I call attention to the form in which I have stated the fundamental postulate of induction, that things which have remained similar for some time are likely to continue to do so. This appears to me to be the right way of stating it. Primitive man is confronted with an extraordinary degree of stability in nature; the hills, the woods, the stars, the shape of his own body remain in large degree similar through time. Certain changes are continually occurring. The progress of knowledge seems to consist largely in being impressed by the stable elements within the changing panorama. Thus the arrangement of the causes of our sensory experience including our own bodies in a three-dimensional continuum rendered an enormous advance possible in the appreciation of stability. In place of a bewildering series of kaleidoscopic changes as I walk about the room, we have the apprehension of stationary and unchanging chairs and tables. Each discovery of laws of nature involves another advance. The ideal of science is to attain a view of things which renders the whole panorama of nature completely constant. Given the configuration of things at a point of time and the laws of nature postulated, the whole process may be regarded as a continuance of the same state of affairs.

If predictions are based on the two hypotheses: (i) that memories are informative, and (ii) that things which have remained similar for some time are likely to continue to do so, their fulfilment is in agreement with these hypotheses. It is to be observed, however, that if either hypothesis is wrong, the verification gives no positive support to the other. Let us consider each hypothesis separately. Suppose that it is desired to verify the hypothesis that things which have remained similar for some time are likely to continue to do so. If memory is known a priori to be informative, it enables us to distinguish the stable from the fleeting elements in experience. We make predictions by extrapolating the stable elements into the future. If by so doing we obtain correct results, there is a strong probability that the
inductive hypothesis which enabled us to do so is correct. If it were incorrect, any one of an infinite number of configurations would have been equally likely to succeed the present experience; consequently it would be very improbable that we should often succeed in predicting the succession which, in fact, occurs. This improbability is the inverse of the probability of the inductive hypothesis established by our success in prediction.

It is to be observed that the predictions here considered are those of everyday in which we rely on elements in our experience already known to have been stable. Predictions designed to test a new hypothesis are in a different class. A new hypothesis is intended to make a revision of our ideas about what the stable elements are, and the success or failure of the prediction only has relevance to the proposed revision. But the predictions of everyday, which tend to confirm the view that things which have been stable will continue to remain so, are much more numerous, the predictions, namely, that the same old streets, houses, fields, sun, moon, etc., will show themselves in response to appropriate actions on our part.

But if memory is not known to be informative, the alleged verification of the prediction gives no support for the inductive hypothesis for two reasons. (1) There was no valid way when the prediction was made for distinguishing things which had remained similar from those which had not. (2) There is no reason to suppose that a given event was, in fact, predicted.

Now suppose that it is desired to verify the hypothesis that memory is informative. If the inductive hypothesis is known to be correct on independent grounds, the fulfilment of a prediction supports the view that memory is informative. For the fulfilment is _pro tanto_ evidence that the stable elements in the situation have been correctly selected. But that selection was based on the hypothesis that memory is informative, for without the aid of past experience it would be impossible to distinguish the stable from the fleeting elements in a given totality. Therefore, if the selection proves correct it supports the view that memory is informative, and a very high degree of probability for the validity of memory may be obtained. This result, however, would only stand if it could be assumed that the memory of the prediction is correct. But this depends on the memory hypothesis the truth of which is at issue. It has been shown that the informativeness of memory plays a double part in the process of proof, and though accepting the inductive hypothesis _a priori_, would tend to establish the informativeness of memories on which predictions were based, if only those predictions could be assumed to be
correctly remembered, as they cannot be, this attempt to establish the informativeness of memory falls to the ground.

If the inductive principle is not established a priori, the verification of a prediction, even if that could be remembered, would lend no support to the memory hypothesis. If when the prediction is made there is no reason to suppose that hitherto stable elements will live longer than fleeting elements, the fact that the elements selected as stable are found to endure is no evidence that the memory hypothesis which enabled them to be selected as stable is correct.

Thus the position is that if the validity of memory were known a priori, the verifications of predictions would lend strong support to the inductive hypothesis. If the inductive hypothesis were accepted a priori the verifications of predictions would lend strong support to the memory hypothesis if only we could be sure independently that predictions were correctly remembered.

If neither hypothesis can be accepted a priori, the verifications of predictions are in agreement with the two hypotheses, but lend them no support. What is the position? In the present totality I have faint memory structures, such that if lively counterparts are accredited to them, there appear to be stable elements in nature. I have memories of predictions based on the supposition that those stable elements will continue stable. But I have no reason to suppose that the lively counterparts existed, I have no reason to suppose that the predictions existed, and I have no reason to suppose that stable elements are likely to continue stable. The whole scheme of ideas is mutually consistent, but I have no reason for giving it credence. If I assumed the opposite, no probability would be violated. The whole scheme might well be a product of my fancy here and now. And if that is so, I have no reason whatever to suppose that the universe will not presently dissolve. All prudent men should live on their capital. The rate of interest is far from covering the risk of premature dissolution.

From this impasse it appears to me that we are rescued by two considerations with which I shall deal in turn.

(1) May it not be that the inductive hypothesis can be accepted a priori, not merely as a working hypothesis but as a truth? The proposition is that if certain things have been found to remain stable for some time, they are likely to continue to do so for a little longer. This proposition is conditional. It is not claimed that stable elements have been found, for the memory hypothesis is still subject to inquiry.

It may be feared that I am endeavouring to re-introduce the
principle of the uniformity of nature in new phraseology. But this is by no means so. I am only claiming a uniformity limited in space and time and scope of application, and I am only claiming probability, not certainty. The general uniformity of nature appears to me a wild and somewhat disreputable speculation of philosophers.

The principle for which I argue can only be established by reference to the general nature of the universe. Of this in a certain sense we know nothing a priori. It might be a Heraclitean flux through and through, or it might be uniform through and through, or it might be any form of admixture. But suppose it were possible to discover by experience that it was not Heraclitean through and through, would anything follow? Let us suppose that by experience it was discovered to have certain stable elements in some part of it. Experience only vouches with certainty for that part of it which constitutes the experience. Accepting the experience and turning to review the general constitution of the universe, it would be possible to say of it that it has in a certain part of it stable elements. Now, if contact has been made with certain stable fragments, it is improbable at any time that one is on the extreme edge of those fragments. Whatever their size, it is much more probable that one is at some distance from the edge.

To say that anything is as likely to happen as anything else at a given moment despite experience, is to affirm that immediately outside experience the universe is entirely Heraclitean. If it has not been so within experience, then one must just have finished exploring the whole of a specialised fragment, and this, though possible, is a priori improbable.

The principle stated is related to the theory of sampling, and it is suggested that it should stand at the basis of all logic. Of course, as is well known, a sample may be entirely misleading; and this is recognised when it is admitted that the universe may at the next instant dissolve and leave not a wrack behind. In the absence of knowledge to the contrary the sample may be accepted as a guide to what is likely to be in the vicinity.

It is important to emphasise that this principle is not based on experience; only if its validity is independently established, shall we be able to tap the findings of past experience. Within a present, however, we have experience of one kind of continuity—spatial. In reflecting upon this, we may contemplate an example of an application of the principle. A room commonly contains smooth surfaces of various shapes and sizes. 'Suppose a man's vision, reduced to a pin-point, to move for a pre-determined
finite length over a surface, or alternatively the finger of some one blindfolded. It is improbable that at the end of the time it would rest on the edge of the surface. This proposition is independent of the sizes of the objects and of the distribution of their sizes. There is no assumption of an equally probable chance of each size or of a distribution according to any law. The room may be filled with a chance collection of heterogeneous objects; the probability is valid, however improbable—according to some other principle—is the distribution of sizes; and of course it is assumed that this is entirely unknown. The meaning of this probability principle may here be interpreted in terms of frequency. If a large number of experiments are made, the eye or hand will come to rest on the edge of a surface much less often than at some point a finite distance from the edge.

It may be objected that the experiment will take time to perform. But no experiment is necessary. The truth may be apprehended \emph{a priori} within a given present. No doubt, if the experiment is made the principle will be verified. But, as in the case of some more sophisticated probability propositions, the experiment would be entirely hocus; if carried out, it would only serve to establish the propriety of the conditions, namely that the parties to it had acted in good faith, and not the truth of the probability proposition itself.

There need be no hesitation in passing from spatial to temporal continuities, for the spatial character of the surface plays no part in aiding the mind to apprehend the probability law.

It is with reluctance, that I have introduced this \emph{a priori} principle. I put it forward, however, with some confidence; and would even venture that it may be possible to build much of the structure of logic upon it alone. The temptation to consider its relation to the orthodox theory of probability must be resisted here. Has not too much attention been paid in that theory to the concomitance of characteristics, and too little to the existence of stabilities in nature? The consequence has been an unnecessary and unrealistic assumption of atomism, with its corollary, from which no honest escape is possible, that we can neither know nor reasonably conjecture anything whatever about what is likely to happen next. It is sometimes forgotten that atomism is itself an hypothesis requiring to be justified by evidence. It cannot therefore be adduced in argument against the probability here set out which makes no assumption about the general character of the universe whatever.

Now so far the informative character of memory has not been admitted, and the inductive postulate has been stated in a condi-
tional form. But it has already been shown that if the inductive postulate could be accepted in this form a priori, and waiving for the moment the difficulty about remembering predictions, to which I shall return, the memory hypothesis would be strongly supported by the fulfilment of predictions.

If memories are informative, stable elements can be selected. If it is reasonable a priori to assume the continued stability of these, predictions can be made. In general, if a prediction is fulfilled it is highly probable that it was made on correct grounds, for any one out of an infinite number of things may happen.¹

If we start from the position that any one of an infinite number of things may happen at any moment, the fulfilment of the prediction of a particular thing verifies in high degree the grounds of the prediction. Now the grounds for the myriad predictions of everyday life, which are in fact fulfilled, depend on the informative character of memory. For only if memory is informative can we distinguish the stable elements in the universe. Therefore there is very strong empirical support for the informative character of memory.

At an earlier stage, it was held that if either the memory hypothesis or the inductive hypothesis could be established a priori, experience would give strong support for the other. Those who cherish that internal feeling of assurance which they have in regard to their memories may have hoped that I should be driven to postulate the informative character of memory a priori. In fact, I have done the opposite. It may now be confessed that the alternatives were not quite symmetrical, and that the support given to the inductive hypothesis by postulating the informative character of memory would not have been entirely satisfactory.

The correct results of predictions based on memory would have established the continuity of stable elements in the period falling within the predictions. But a person who was profoundly sceptical of the stability of the universe might contend that nothing was established for the future. At the next moment all would probably change. Indeed, if the validity of memory is accepted, the fulfilment of the predictions really adds little. If the stability revealed by memories stretching, say, for forty years is no evidence of continued stability, the stability revealed for the few extra hours or days during which a prediction is

¹The idea that fulfilment tends to verify in a high degree the grounds of a prediction sounds at first blush paradoxical. But this is because by prediction is usually meant the choice among a small number of possible alternatives; in this case fulfilment only gives a low degree of support for the grounds of the prediction.
fulfilled is no evidence either. The sceptic must be routed on his own ground by the assertion of the validity of the inductive principle. Once that is done, the memory hypothesis may be established by induction in an unexceptionable manner. It only remains to consider the memory of prediction, for all this theory falls to the ground if at the time of fulfilment there is no reason to suppose that the prediction was ever made.

(2) The second source from which I seek to draw support in defeating scepticism is the specious present. It appears to me that predictions are often made and fulfilled within a specious present, so that there is no need to resort to memory to find instances of predictions fulfilled. For instance, I may predict continuity for the ordinary objects around me and the prediction may be fulfilled within one present totality. And if a flash of lightning occurs, I may predict and experience its end within the same totality. Only if memory is informative should I have grounds for predicting continuity for the chairs and tables and death for the lightning flash; the success of the prediction within the specious present is therefore strong evidence of the informativeness of memory.

In discussing induction, for economy and to avoid vexed questions, I confined myself to the probability that things which had remained similar for some time would continue to do so. In illustrating the richness of the specious present, it may be permitted also to give examples of the fulfilment in it of other predictions which depend on memory being informative, although they involve the use of a more elaborate inductive argument.

For instance, the prediction that a specific act of volition will result in my arm being raised and the raising of my arm may surely lie within a specious present. This confirms the informative character of my memory of the effects of similar acts of volition in the past.

Or, again, I may hear the early notes of a well-remembered tune. My memories teach me that the vocal chords or instruments which produce such noises usually, though not always, continue to the bitter end. And, hark, of all the million and one sounds and noises that might have supervened, just those expected notes come forth. This instance is a good one. For it is generally admitted that if the successive notes of a tune did not lie within the specious present, they could not be recognised as constituting a tune at all.

If these two lines of thought are correct, the case for the empirical basis of our trust in memory is complete, and the logician’s qualms when faced with the plain man’s petulant “but
I have direct knowledge that I have just walked down the street may be dispelled.

The vindication of the informative character of memory here set forth may reduce difficulties connected with its causal relation to the events remembered. So long as memory is regarded as a kind of self-authenticating knowledge of past events, vouching by virtue of its own internal nature for the predications made, some very queer relation between the memory and the past has to be assumed. This relation seems out of harmony with the ordinary processes of nature known to us. Now, though there is still more in heaven and earth than falls within our comprehension, and we could not refuse to postulate a quasi-mystical link between the present and past if the facts required it, it is proper to pause and re-examine the ground carefully before doing so. The account which I have given dispenses with the necessity of assuming any such link. The memory may be regarded as a trace left by the lively event, a footprint in the sand, or the resuscitated pain of an old wound. The human constitution reacts sharply to such an occurrence with the propensity to predicate. But the memory itself says nothing and knows nothing. A hypothesis may then be made that memory is informative just as a hypothesis might be suggested by the footprint that the island is inhabited. The hypothesis is found by experience to be highly probable. But long before this verification has been explicitly checked, man’s instinctive equipment makes him get busy and think and act as though he knew that the memory was informative. A by-product of this instinct is that philosophers have been led to exaggerate the scope of our intuitive knowledge to the detriment of their own studies.

One more word should be said about the heedless credence given by common sense to memory. There is every reason to suppose that man is endowed with a violently strong propensity to trust to memory, that is, to conjoin liveliness in his imagination to the faint structures thrown up in the present by past lively structures, and to wish to predicate that conjunction as a fact. Trust in memory has been of immense biological advantage. And the instinct in rational man to impose such trust had to be especially violent precisely because, pending his full comprehension of the inductive principle, there was no reason whatever to do so. In many respects man has been much guided by the reason that is strong within him, but if in the early stage of its development he had been led by it to complete scepticism about his memories, he would have been lost. It is sometimes beneficial to have anti-rational impulses strong enough to resist the quiet and gentle
but relentless voice of reason. It is the same note of the primitive in "I know I walked down the street" that one hears again in "I know our leader is a god". These blemishes of immaturity protect man until he reaches his full stature.

In this case of memory, the anti-rational instinct takes him to the same conclusion that reason reaches by a more circuitous and arduous route. And so there is no need for him to endeavour subsequently to shake off the instinct, even if he could. Indeed, he is fortunate in his endowment, for in the rough interludes of history the finer processes of thought may suffer eclipse. So long as the human constitution is conserved, this instinct will remain and, by its consilience with the processes of reason, serve in their stead.

The Pragmatist holds that what works is true. If the arguments of this paper were wrong, that would probably be about the best status one could find for the veridicity of memory. It would be a depressing view, since on it the environment might very probably change in such a way that trust in memory would "work" no longer, but man would be unlikely to succeed in shuffling out of his instinct, which would then be injurious. So long as we are in the position of holding that nothing about the world can ever be known with any degree of rational assurance, there is a temptation to relapse into the pragmatist philosophy. Jabbing at the extreme opinion that no man is any wiser, nor any act more sensible than another, one may take the view that some assumptions, though without foundation in logic, have in fact worked, and that all we mean by wise and sensible may be defined as efficiency in using the assumptions. Biological considerations may reinforce the arguments in favour of pragmatism. It is the purpose of this paper to suggest an alternative philosophy. While denying that the true may be defined as what works, its contention is not inconsistent with the view that the only ground at the level of common sense for trusting memory is that it does work, and that this trust may be connected with biological survival.

The denial that memory is a form of direct intuition and the view that its claim to be informative is a mere hypothesis subject to the test of experience may seem to some unduly sceptical. Yet in the upshot I claim that it provides the only available refuge from scepticism. On the one hand we are confronted with the deductive school, who rely on intuitions, the apprehension of necessary connexions and demonstrations therefrom and relegate induction to a subordinate place. It has always or, should I say, almost always appeared to me that if that view
were correct, nothing whatever could be known or reasonably conjectured about the world. On the other side are the logical positivists who laud induction to the skies and then explain that valid induction merely means obeying certain arbitrarily selected rules. Dare I hope that my middle position is better founded than either of these extremes?