LECTURE XIII. TRUTH AND FALSEHOOD

The definition of truth and falsehood, which is our topic to-day, lies strictly outside our general subject, namely the analysis of mind. From the psychological standpoint, there may be different kinds of belief, and different degrees of certainty, but there cannot be any purely psychological means of distinguishing between true and false beliefs. A belief is rendered true or false by relation to a fact, which may lie outside the experience of the person entertaining the belief. Truth and falsehood, except in the case of beliefs about our own minds, depend upon the relations of mental occurrences to outside things, and thus take us beyond the analysis of mental occurrences as they are in themselves. Nevertheless, we can hardly avoid the consideration of truth and falsehood. We wish to believe that our beliefs, sometimes at least, yield KNOWLEDGE, and a belief does not yield knowledge unless it is true. The question whether our minds are instruments of knowledge, and, if so, in what sense, is so vital that any suggested analysis of mind must be examined in relation to this question. To ignore this question would be like describing a chronometer without regard to its accuracy as a time-keeper, or a thermometer without mentioning the fact that it measures temperature.

Many difficult questions arise in connection with knowledge. It is difficult to define knowledge, difficult to decide whether we have any knowledge, and difficult, even if it is conceded that we sometimes have knowledge to discover whether we can ever know that we have knowledge

in this or that particular case. I shall divide the discussion into four parts:

I. We may regard knowledge, from a behaviourist standpoint, as exhibited in a certain kind of response to the environment. This response must have some characteristics which it shares with those of scientific instruments, but must also have others that are peculiar to knowledge. We shall find that this point of view is important, but not exhaustive of the nature of knowledge.

II. We may hold that the beliefs that constitute knowledge are distinguished from such as are erroneous or uncertain by properties which are intrinsic either to single beliefs or to systems of beliefs, being in either case discoverable without reference to outside fact. Views of this kind have been widely held among philosophers, but we shall find no reason to accept them.

III. We believe that some beliefs are true, and some false. This raises the problem of VERIFIABILITY: are there any circumstances which can justifiably give us an unusual degree of certainty that such and such a belief is true? It is obvious that there are circumstances which in fact cause a certainty of this sort, and we wish to learn what we can from examining these circumstances.

IV. Finally, there is the formal problem of defining truth and falsehood, and deriving the objective reference of a proposition from

the meanings of its component words.

We will consider these four problems in succession.

I. We may regard a human being as an instrument, which makes various responses to various stimuli. If we observe these responses from outside, we shall regard them as showing knowledge when they display two characteristics, ACCURACY and APPROPRIATENESS. These two are quite distinct, and even sometimes incompatible. If I am being pursued by a tiger, accuracy is furthered by turning round to look at him, but appropriateness by running away without making any search for further knowledge of the beast. I shall return to the question of appropriateness later; for the present it is accuracy that I wish to consider.

When we are viewing a man from the outside, it is not his beliefs, but his bodily movements, that we can observe. His knowledge must be inferred from his bodily movements, and especially from what he says and writes. For the present we may ignore beliefs, and regard a man's knowledge as actually consisting in what he says and does. That is to say, we will construct, as far as possible, a purely behaviouristic account of truth and falsehood.

If you ask a boy "What is twice two?" and the boy says "four," you take that as prima facie evidence that the boy knows what twice two is. But if you go on to ask what is twice three, twice four, twice five, and so

on, and the boy always answers "four," you come to the conclusion that he knows nothing about it. Exactly similar remarks apply to scientific instruments. I know a certain weather-cock which has the pessimistic habit of always pointing to the north-east. If you were to see it first on a cold March day, you would think it an excellent weather-cock; but with the first warm day of spring your confidence would be shaken. The boy and the weather-cock have the same defect: they do not vary their response when the stimulus is varied. A good instrument, or a person with much knowledge, will give different responses to stimuli which differ in relevant ways. This is the first point in defining accuracy of response.

We will now assume another boy, who also, when you first question him, asserts that twice two is four. But with this boy, instead of asking him different questions, you make a practice of asking him the same question every day at breakfast. You find that he says five, or six, or seven, or any other number at random, and you conclude that he also does not know what twice two is, though by good luck he answered right the first time. This boy is like a weather-cock which, instead of being stuck fast, is always going round and round, changing without any change of wind. This boy and weather-cock have the opposite defect to that of the previous pair: they give different responses to stimuli which do not differ in any relevant way.

In connection with vagueness in memory, we already had occasion to consider the definition of accuracy. Omitting some of the niceties of

our previous discussion, we may say that an instrument is ACCURATE when it avoids the defects of the two boys and weather-cocks, that is to say, when--

(a) It gives different responses to stimuli which differ in relevant ways;

(b) It gives the same response to stimuli which do not differ in relevant ways.

What are relevant ways depends upon the nature and purpose of the instrument. In the case of a weather-cock, the direction of the wind is relevant, but not its strength; in the case of the boy, the meaning of the words of your question is relevant, but not the loudness of your voice, or whether you are his father or his schoolmaster If, however, you were a boy of his own age, that would be relevant, and the appropriate response would be different.

It is clear that knowledge is displayed by accuracy of response to certain kinds of stimuli, e.g. examinations. Can we say, conversely, that it consists wholly of such accuracy of response? I do not think we can; but we can go a certain distance in this direction. For this purpose we must define more carefully the kind of accuracy and the kind of response that may be expected where there is knowledge.

From our present point of view, it is difficult to exclude perception

from knowledge; at any rate, knowledge is displayed by actions based upon perception. A bird flying among trees avoids bumping into their branches; its avoidance is a response to visual sensations. This response has the characteristic of accuracy, in the main, and leads us to say that the bird "knows," by sight, what objects are in its neighbourhood. For a behaviourist, this must certainly count as knowledge, however it may be viewed by analytic psychology. In this case, what is known, roughly, is the stimulus; but in more advanced knowledge the stimulus and what is known become different. For example, you look in your calendar and find that Easter will be early next year. Here the stimulus is the calendar, whereas the response concerns the future. Even this can be paralleled among instruments: the behaviour of the barometer has a present stimulus but foretells the future, so that the barometer might be said, in a sense, to know the future. However that may be, the point I am emphasizing as regards knowledge is that what is known may be quite different from the stimulus, and no part of the cause of the knowledge-response. It is only in sense-knowledge that the stimulus and what is known are, with qualifications, identifiable. In knowledge of the future, it is obvious that they are totally distinct, since otherwise the response would precede the stimulus. In abstract knowledge also they are distinct, since abstract facts have no date. In knowledge of the past there are complications, which we must briefly examine.

Every form of memory will be, from our present point of view, in one sense a delayed response. But this phrase does not quite clearly

express what is meant. If you light a fuse and connect it with a heap of dynamite, the explosion of the dynamite may be spoken of, in a sense, as a delayed response to your lighting of the fuse. But that only means that it is a somewhat late portion of a continuous process of which the earlier parts have less emotional interest. This is not the case with habit. A display of habit has two sorts of causes: (a) the past occurrences which generated the habit, (b) the present occurrence which brings it into play. When you drop a weight on your toe, and say what you do say, the habit has been caused by imitation of your undesirable associates, whereas it is brought into play by the dropping of the weight. The great bulk of our knowledge is a habit in this sense: whenever I am asked when I was born, I reply correctly by mere habit. It would hardly be correct to say that getting born was the stimulus, and that my reply is a delayed response But in cases of memory this way of speaking would have an element of truth. In an habitual memory, the event remembered was clearly an essential part of the stimulus to the formation of the habit. The present stimulus which brings the habit into play produces a different response from that which it would produce if the habit did not exist. Therefore the habit enters into the causation of the response, and so do, at one remove, the causes of the habit. It follows that an event remembered is an essential part of the causes of our remembering.

In spite, however, of the fact that what is known is SOMETIMES an indispensable part of the cause of the knowledge, this circumstance is, I think, irrelevant to the general question with which we are concerned,

namely What sort of response to what sort of stimulus can be regarded as displaying knowledge? There is one characteristic which the response must have, namely, it must consist of voluntary movements. The need of this characteristic is connected with the characteristic of APPROPRIATENESS, which I do not wish to consider as yet. For the present I wish only to obtain a clearer idea of the sort of ACCURACY that a knowledge-response must have. It is clear from many instances that accuracy, in other cases, may be purely mechanical. The most complete form of accuracy consists in giving correct answers to questions, an achievement in which calculating machines far surpass human beings. In asking a question of a calculating machine, you must use its language: you must not address it in English, any more than you would address an Englishman in Chinese. But if you address it in the language it understands, it will tell you what is 34521 times 19987, without a moment's hesitation or a hint of inaccuracy. We do not say the machine KNOWS the answer, because it has no purpose of its own in giving the answer: it does not wish to impress you with its cleverness, or feel proud of being such a good machine. But as far as mere accuracy goes, the machine leaves nothing to be desired.

Accuracy of response is a perfectly clear notion in the case of answers to questions, but in other cases it is much more obscure. We may say generally that an object whether animate or inanimate, is "sensitive" to a certain feature of the environment if it behaves differently according to the presence or absence of that feature. Thus iron is sensitive to anything magnetic. But sensitiveness does not constitute knowledge, and

knowledge of a fact which is not sensible is not sensitiveness to that fact, as we have seen in distinguishing the fact known from the stimulus. As soon as we pass beyond the simple case of question and answer, the definition of knowledge by means of behaviour demands the consideration of purpose. A carrier pigeon flies home, and so we say it "knows" the way. But if it merely flew to some place at random, we should not say that it "knew" the way to that place, any more than a stone rolling down hill knows the way to the valley.

On the features which distinguish knowledge from accuracy of response in general, not much can be said from a behaviourist point of view without referring to purpose. But the necessity of SOMETHING besides accuracy of response may be brought out by the following consideration: Suppose two persons, of whom one believed whatever the other disbelieved, and disbelieved whatever the other believed. So far as accuracy and sensitiveness of response alone are concerned, there would be nothing to choose between these two persons. A thermometer which went down for warm weather and up for cold might be just as accurate as the usual kind; and a person who always believes falsely is just as sensitive an instrument as a person who always believes truly. The observable and practical difference between them would be that the one who always believed falsely would quickly come to a bad end. This illustrates once more that accuracy of response to stimulus does not alone show knowledge, but must be reinforced by appropriateness, i.e. suitability for realizing one's purpose. This applies even in the apparently simple case of answering questions: if the purpose of the answers is to deceive, their falsehood,

not their truth, will be evidence of knowledge. The proportion of the combination of appropriateness with accuracy in the definition of knowledge is difficult; it seems that both enter in, but that appropriateness is only required as regards the general type of response, not as regards each individual instance.

II. I have so far assumed as unquestionable the view that the truth or falsehood of a belief consists in a relation to a certain fact, namely the objective of the belief. This view has, however, been often questioned. Philosophers have sought some intrinsic criterion by which true and false beliefs could be distinguished.* I am afraid their chief reason for this search has been the wish to feel more certainty than seems otherwise possible as to what is true and what is false. If we could discover the truth of a belief by examining its intrinsic characteristics, or those of some collection of beliefs of which it forms part, the pursuit of truth, it is thought, would be a less arduous business than it otherwise appears to be. But the attempts which have been made in this direction are not encouraging. I will take two criteria which have been suggested, namely, (1) self-evidence, (2) mutual coherence. If we can show that these are inadequate, we may feel fairly certain that no intrinsic criterion hitherto suggested will suffice to distinguish true from false beliefs.

* The view that such a criterion exists is generally held by those whose views are in any degree derived from Hegel. It may be illustrated by the following passage from Lossky,

"The Intuitive Basis of Knowledge" (Macmillan, 1919), p. 268: "Strictly speaking, a false judgment is not a judgment at all. The predicate does not follow from the subject S alone, but from the subject plus a certain addition C, WHICH IN NO SENSE BELONGS TO THE CONTENT OF THE JUDGMENT. What takes place may be a process of association of ideas, of imagining, or the like, but is not a process of judging. An experienced psychologist will be able by careful observation to detect that in this process there is wanting just the specific element of the objective dependence of the predicate upon the subject which is characteristic of a judgment. It must be admitted, however, that an exceptional power of observation is needed in order to distinguish, by means of introspection, mere combination of ideas from judgments."

(1) Self-evidence.--Some of our beliefs seem to be peculiarly indubitable. One might instance the belief that two and two are four, that two things cannot be in the same place at the same time, nor one thing in two places, or that a particular buttercup that we are seeing is yellow. The suggestion we are to examine is that such: beliefs have some recognizable quality which secures their truth, and the truth of whatever is deduced from them according to self-evident principles of inference. This theory is set forth, for example, by Meinong in his book, "Ueber die Erfahrungsgrundlagen unseres Wissens."

If this theory is to be logically tenable, self-evidence must not consist merely in the fact that we believe a proposition. We believe that our beliefs are sometimes erroneous, and we wish to be able to select a certain class of beliefs which are never erroneous. If we are to do this, it must be by some mark which belongs only to certain beliefs, not to all; and among those to which it belongs there must be none that are mutually inconsistent. If, for example, two propositions p and q were self-evident, and it were also self-evident that p and q could not both be true, that would condemn self-evidence as a guarantee of truth. Again, self-evidence must not be the same thing as the absence of doubt or the presence of complete certainty. If we are completely certain of a proposition, we do not seek a ground to support our belief. If self-evidence is alleged as a ground of belief, that implies that doubt has crept in, and that our self-evident proposition has not wholly resisted the assaults of scepticism. To say that any given person believes some things so firmly that he cannot be made to doubt them is no doubt true. Such beliefs he will be willing to use as premisses in reasoning, and to him personally they will seem to have as much evidence as any belief can need. But among the propositions which one man finds indubitable there will be some that another man finds it quite possible to doubt. It used to seem self-evident that there could not be men at the Antipodes, because they would fall off, or at best grow giddy from standing on their heads. But New Zealanders find the falsehood of this proposition self-evident. Therefore, if self-evidence is a guarantee of truth, our ancestors must have been mistaken in thinking their beliefs

about the Antipodes self-evident. Meinong meets this difficulty by saying that some beliefs are falsely thought to be self-evident, but in the case of others it is self-evident that they are self-evident, and these are wholly reliable. Even this, however, does not remove the practical risk of error, since we may mistakenly believe it self-evident that a certain belief is self-evident. To remove all risk of error, we shall need an endless series of more and more complicated self-evident beliefs, which cannot possibly be realized in practice. It would seem, therefore, that self-evidence is useless as a practical criterion for insuring truth.

The same result follows from examining instances. If we take the four instances mentioned at the beginning of this discussion, we shall find that three of them are logical, while the fourth is a judgment of perception. The proposition that two and two are four follows by purely logical deduction from definitions: that means that its truth results, not from the properties of objects, but from the meanings of symbols. Now symbols, in mathematics, mean what we choose; thus the feeling of self-evidence, in this case, seems explicable by the fact that the whole matter is within our control. I do not wish to assert that this is the whole truth about mathematical propositions, for the question is complicated, and I do not know what the whole truth is. But I do wish to suggest that the feeling of self-evidence in mathematical propositions has to do with the fact that they are concerned with the meanings of symbols, not with properties of the world such as external observation might reveal.

Similar considerations apply to the impossibility of a thing being in two places at once, or of two things being in one place at the same time. These impossibilities result logically, if I am not mistaken, from the definitions of one thing and one place. That is to say, they are not laws of physics, but only part of the intellectual apparatus which we have manufactured for manipulating physics. Their self-evidence, if this is so, lies merely in the fact that they represent our decision as to the use of words, not a property of physical objects.

Judgments of perception, such as "this buttercup is yellow," are in a quite different position from judgments of logic, and their self-evidence must have a different explanation. In order to arrive at the nucleus of such a judgment, we will eliminate, as far as possible, the use of words which take us beyond the present fact, such as "buttercup" and "yellow." The simplest kind of judgment underlying the perception that a buttercup is yellow would seem to be the perception of similarity in two colours seen simultaneously. Suppose we are seeing two buttercups, and we perceive that their colours are similar. This similarity is a physical fact, not a matter of symbols or words; and it certainly seems to be indubitable in a way that many judgments are not.

The first thing to observe, in regard to such judgments, is that as they stand they are vague. The word "similar" is a vague word, since there are degrees of similarity, and no one can say where similarity ends and dissimilarity begins. It is unlikely that our two buttercups have

EXACTLY the same colour, and if we judged that they had we should have passed altogether outside the region of self-evidence. To make our proposition more precise, let us suppose that we are also seeing a red rose at the same time. Then we may judge that the colours of the buttercups are more similar to each other than to the colour of the rose. This judgment seems more complicated, but has certainly gained in precision. Even now, however, it falls short of complete precision, since similarity is not prima facie measurable, and it would require much discussion to decide what we mean by greater or less similarity. To this process of the pursuit of precision there is strictly no limit.

The next thing to observe (although I do not personally doubt that most of our judgments of perception are true) is that it is very difficult to define any class of such judgments which can be known, by its intrinsic quality, to be always exempt from error. Most of our judgments of perception involve correlations, as when we judge that a certain noise is that of a passing cart. Such judgments are all obviously liable to error, since there is no correlation of which we have a right to be certain that it is invariable. Other judgments of perception are derived from recognition, as when we say "this is a buttercup," or even merely "this is yellow." All such judgments entail some risk of error, though sometimes perhaps a very small one; some flowers that look like buttercups are marigolds, and colours that some would call yellow others might call orange. Our subjective certainty is usually a result of habit, and may lead us astray in circumstances which are unusual in ways of which we are unaware.

For such reasons, no form of self-evidence seems to afford an absolute criterion of truth. Nevertheless, it is perhaps true that judgments having a high degree of subjective certainty are more apt to be true than other judgments. But if this be the case, it is a result to be demonstrated, not a premiss from which to start in defining truth and falsehood. As an initial guarantee, therefore, neither self-evidence nor subjective certainty can be accepted as adequate.

(2) Coherence.--Coherence as the definition of truth is advocated by idealists, particularly by those who in the main follow Hegel. It is set forth ably in Mr. Joachim's book, "The Nature of Truth" (Oxford, 1906). According to this view, any set of propositions other than the whole of truth can be condemned on purely logical grounds, as internally inconsistent; a single proposition, if it is what we should ordinarily call false, contradicts itself irremediably, while if it is what we should ordinarily call true, it has implications which compel us to admit other propositions, which in turn lead to others, and so on, until we find ourselves committed to the whole of truth. One might illustrate by a very simple example: if I say "so-and-so is a married man," that is not a self-subsistent proposition. We cannot logically conceive of a universe in which this proposition constituted the whole of truth. There must be also someone who is a married woman, and who is married to the particular man in question. The view we are considering regards everything that can be said about any one object as relative in the same sort of way as "so-and-so is a married man." But everything, according

to this view, is relative, not to one or two other things, but to all other things, so that from one bit of truth the whole can be inferred.

The fundamental objection to this view is logical, and consists in a criticism of its doctrine as to relations. I shall omit this line of argument, which I have developed elsewhere.* For the moment I will content myself with saying that the powers of logic seem to me very much less than this theory supposes. If it were taken seriously, its advocates ought to profess that any one truth is logically inferable from any other, and that, for example, the fact that Caesar conquered Gaul, if adequately considered, would enable us to discover what the weather will be to-morrow. No such claim is put forward in practice, and the necessity of empirical observation is not denied; but according to the theory it ought to be.

* In the article on "The Monistic Theory of Truth" in "Philosophical Essays" (Longmans, 1910), reprinted from the "Proceedings of the Aristotelian Society," 1906-7.

Another objection is that no endeavour is made to show that we cannot form a consistent whole composed partly or wholly of false propositions, as in a novel. Leibniz's conception of many possible worlds seems to accord much better with modern logic and with the practical empiricism which is now universal. The attempt to deduce the world by pure thought is attractive, and in former times was largely supposed capable of success. But nowadays most men admit that beliefs must be tested by

observation, and not merely by the fact that they harmonize with other beliefs. A consistent fairy-tale is a different thing from truth, however elaborate it may be. But to pursue this topic would lead us into difficult technicalities; I shall therefore assume, without further argument, that coherence is not sufficient as a definition of truth.

III. Many difficult problems arise as regards the verifiability of beliefs. We believe various things, and while we believe them we think we know them. But it sometimes turns out that we were mistaken, or at any rate we come to think we were. We must be mistaken either in our previous opinion or in our subsequent recantation; therefore our beliefs are not all correct, and there are cases of belief which are not cases of knowledge. The question of verifiability is in essence this: can we discover any set of beliefs which are never mistaken or any test which, when applicable, will always enable us to discriminate between true and false beliefs? Put thus broadly and abstractly, the answer must be negative. There is no way hitherto discovered of wholly eliminating the risk of error, and no infallible criterion. If we believe we have found a criterion, this belief itself may be mistaken; we should be begging the question if we tried to test the criterion by applying the criterion to itself.

But although the notion of an absolute criterion is chimerical, there may be relative criteria, which increase the probability of truth. Common sense and science hold that there are. Let us see what they have to say.

One of the plainest cases of verification, perhaps ultimately the only case, consists in the happening of something expected. You go to the station believing that there will be a train at a certain time; you find the train, you get into it, and it starts at the expected time This constitutes verification, and is a perfectly definite experience. It is, in a sense, the converse of memory instead of having first sensations and then images accompanied by belief, we have first images accompanied by belief and then sensations. Apart from differences as to the time-order and the accompanying feelings, the relation between image and sensation is closely similar in the two cases of memory and expectation; it is a relation of similarity, with difference as to causal efficacy--broadly, the image has the psychological but not the physical effects that the sensation would have. When an image accompanied by an expectation-belief is thus succeeded by a sensation which is the "meaning" of the image, we say that the expectation-belief has been verified. The experience of verification in this sense is exceedingly familiar; it happens every time that accustomed activities have results that are not surprising, in eating and walking and talking and all our daily pursuits.

But although the experience in question is common, it is not wholly easy to give a theoretical account of it. How do we know that the sensation resembles the previous image? Does the image persist in presence of the sensation, so that we can compare the two? And even if SOME image does persist, how do we know that it is the previous image unchanged? It does

not seem as if this line of inquiry offered much hope of a successful issue. It is better, I think, to take a more external and causal view of the relation of expectation to expected occurrence. If the occurrence, when it comes, gives us the feeling of expectedness, and if the expectation, beforehand, enabled us to act in a way which proves appropriate to the occurrence, that must be held to constitute the maximum of verification. We have first an expectation, then a sensation with the feeling of expectedness related to memory of the expectation. This whole experience, when it occurs, may be defined as verification, and as constituting the truth of the expectation. Appropriate action, during the period of expectation, may be regarded as additional verification, but is not essential. The whole process may be illustrated by looking up a familiar quotation, finding it in the expected words, and in the expected part of the book. In this case we can strengthen the verification by writing down beforehand the words which we expect to find.

I think all verification is ultimately of the above sort. We verify a scientific hypothesis indirectly, by deducing consequences as to the future, which subsequent experience confirms. If somebody were to doubt whether Caesar had crossed the Rubicon, verification could only be obtained from the future. We could proceed to display manuscripts to our historical sceptic, in which it was said that Caesar had behaved in this way. We could advance arguments, verifiable by future experience, to prove the antiquity of the manuscript from its texture, colour, etc. We could find inscriptions agreeing with the historian on other points,

and tending to show his general accuracy. The causal laws which our arguments would assume could be verified by the future occurrence of events inferred by means of them. The existence and persistence of causal laws, it is true, must be regarded as a fortunate accident, and how long it will continue we cannot tell. Meanwhile verification remains often practically possible. And since it is sometimes possible, we can gradually discover what kinds of beliefs tend to be verified by experience, and what kinds tend to be falsified; to the former kinds we give an increased degree of assent, to the latter kinds a diminished degree. The process is not absolute or infallible, but it has been found capable of sifting beliefs and building up science. It affords no theoretical refutation of the sceptic, whose position must remain logically unassailable; but if complete scepticism is rejected, it gives the practical method by which the system of our beliefs grows gradually towards the unattainable ideal of impeccable knowledge.

IV. I come now to the purely formal definition of the truth or falsehood of a belief. For this definition it is necessary first of all to consider the derivation of the objective reference of a proposition from the meanings of its component words or images.

Just as a word has meaning, so a proposition has an objective reference. The objective reference of a proposition is a function (in the mathematical sense) of the meanings of its component words. But the objective reference differs from the meaning of a word through the duality of truth and falsehood. You may believe the proposition "to-day

is Tuesday" both when, in fact, to-day is Tuesday, and when to-day is not Tuesday. If to-day is not Tuesday, this fact is the objective of your belief that to-day is Tuesday. But obviously the relation of your belief to the fact is different in this case from what it is in the case when to-day is Tuesday. We may say, metaphorically, that when to-day is Tuesday, your belief that it is Tuesday points TOWARDS the fact, whereas when to-day is not Tuesday your belief points AWAY FROM the fact. Thus the objective reference of a belief is not determined by the fact alone, but by the direction of the belief towards or away from the fact.* If, on a Tuesday, one man believes that it is Tuesday while another believes that it is not Tuesday, their beliefs have the same objective, namely the fact that it is Tuesday but the true belief points towards the fact while the false one points away from it. Thus, in order to define the reference of a proposition we have to take account not only of the objective, but also of the direction of pointing, towards the objective in the case of a true proposition and away from it in the case of a false one.

* I owe this way of looking at the matter to my friend Ludwig Wittgenstein.

This mode of stating the nature of the objective reference of a proposition is necessitated by the circumstance that there are true and false propositions, but not true and false facts. If to-day is Tuesday, there is not a false objective "to-day is not Tuesday," which could be the objective of the false belief "to-day is not Tuesday." This is the

reason why two beliefs which are each other's contradictories have the same objective. There is, however, a practical inconvenience, namely that we cannot determine the objective reference of a proposition, according to this definition, unless we know whether the proposition is true or false. To avoid this inconvenience, it is better to adopt a slightly different phraseology, and say: The "meaning" of the proposition "to-day is Tuesday" consists in pointing to the fact "to-day is Tuesday" if that is a fact, or away from the fact "to-day is not Tuesday" if that is a fact. The "meaning" of the proposition "to-day is not Tuesday" will be exactly the opposite. By this hypothetical form we are able to speak of the meaning of a proposition without knowing whether it is true or false. According to this definition, we know the meaning of a proposition when we know what would make it true and what would make it false, even if we do not know whether it is in fact true or false.

The meaning of a proposition is derivative from the meanings of its constituent words. Propositions occur in pairs, distinguished (in simple cases) by the absence or presence of the word "not." Two such propositions have the same objective, but opposite meanings: when one is true, the other is false, and when one is false, the other is true.

The purely formal definition of truth and falsehood offers little difficulty. What is required is a formal expression of the fact that a proposition is true when it points towards its objective, and false when it points away from it, In very simple cases we can give a very simple

account of this: we can say that true propositions actually resemble their objectives in a way in which false propositions do not. But for this purpose it is necessary to revert to image-propositions instead of word-propositions. Let us take again the illustration of a memory-image of a familiar room, and let us suppose that in the image the window is to the left of the door. If in fact the window is to the left of the door, there is a correspondence between the image and the objective; there is the same relation between the window and the door as between the images of them. The image-memory consists of the image of the window to the left of the image of the door. When this is true, the very same relation relates the terms of the objective (namely the window and the door) as relates the images which mean them. In this case the correspondence which constitutes truth is very simple.

In the case we have just been considering the objective consists of two parts with a certain relation (that of left-to-right), and the proposition consists of images of these parts with the very same relation. The same proposition, if it were false, would have a less simple formal relation to its objective. If the image-proposition consists of an image of the window to the left of an image of the door, while in fact the window is not to the left of the door, the proposition does not result from the objective by the mere substitution of images for their prototypes. Thus in this unusually simple case we can say that a true proposition "corresponds" to its objective in a formal sense in which a false proposition does not. Perhaps it may be possible to modify this notion of formal correspondence in such a way as to be more widely

applicable, but if so, the modifications required will be by no means slight. The reasons for this must now be considered.

To begin with, the simple type of correspondence we have been exhibiting can hardly occur when words are substituted for images, because, in word-propositions, relations are usually expressed by words, which are not themselves relations. Take such a proposition as "Socrates precedes Plato." Here the word "precedes" is just as solid as the words "Socrates" and "Plato"; it MEANS a relation, but is not a relation. Thus the objective which makes our proposition true consists of TWO terms with a relation between them, whereas our proposition consists of THREE terms with a relation of order between them. Of course, it would be perfectly possible, theoretically, to indicate a few chosen relations, not by words, but by relations between the other words. "Socrates-Plato" might be used to mean "Socrates precedes Plato"; "Plato-Socrates" might be used to mean "Plato was born before Socrates and died after him"; and so on. But the possibilities of such a method would be very limited. For aught I know, there may be languages that use it, but they are not among the languages with which I am acquainted. And in any case, in view of the multiplicity of relations that we wish to express, no language could advance far without words for relations. But as soon as we have words for relations, word-propositions have necessarily more terms than the facts to which they refer, and cannot therefore correspond so simply with their objectives as some image-propositions can.

The consideration of negative propositions and negative facts introduces

further complications. An image-proposition is necessarily positive: we can image the window to the left of the door, or to the right of the door, but we can form no image of the bare negative "the window not to the left of the door." We can DISBELIEVE the image-proposition expressed by "the window to the left of the door," and our disbelief will be true if the window is not to the left of the door. But we can form no image of the fact that the window is not to the left of the door. Attempts have often been made to deny such negative facts, but, for reasons which I have given elsewhere,* I believe these attempts to be mistaken, and I shall assume that there are negative facts.

* "Monist," January, 1919, p. 42 ff.

Word-propositions, like image-propositions, are always positive facts. The fact that Socrates precedes Plato is symbolized in English by the fact that the word "precedes" occurs between the words "Socrates" and "Plato." But we cannot symbolize the fact that Plato does not precede Socrates by not putting the word "precedes" between "Plato" and "Socrates." A negative fact is not sensible, and language, being intended for communication, has to be sensible. Therefore we symbolize the fact that Plato does not precede Socrates by putting the words "does not precede" between "Plato" and "Socrates." We thus obtain a series of words which is just as positive a fact as the series "Socrates precedes Plato." The propositions asserting negative facts are themselves positive facts; they are merely different positive facts from those asserting positive facts.

We have thus, as regards the opposition of positive and negative, three different sorts of duality, according as we are dealing with facts, image-propositions, or word-propositions. We have, namely:

(1) Positive and negative facts;

(2) Image-propositions, which may be believed or disbelieved, but do not allow any duality of content corresponding to positive and negative facts;

(3) Word-propositions, which are always positive facts, but are of two kinds: one verified by a positive objective, the other by a negative objective.

Owing to these complications, the simplest type of correspondence is impossible when either negative facts or negative propositions are involved.

Even when we confine ourselves to relations between two terms which are both imaged, it may be impossible to form an image-proposition in which the relation of the terms is represented by the same relation of the images. Suppose we say "Caesar was 2,000 years before Foch," we express a certain temporal relation between Caesar and Foch; but we cannot allow 2,000 years to elapse between our image of Caesar and our image of Foch. This is perhaps not a fair example, since "2,000 years before" is not a

direct relation. But take a case where the relation is direct, say, "the sun is brighter than the moon." We can form visual images of sunshine and moonshine, and it may happen that our image of the sunshine is the brighter of the two, but this is by no means either necessary or sufficient. The act of comparison, implied in our judgment, is something more than the mere coexistence of two images, one of which is in fact brighter than the other. It would take us too far from our main topic if we were to go into the question what actually occurs when we make this judgment. Enough has been said to show that the correspondence between the belief and its objective is more complicated in this case than in that of the window to the left of the door, and this was all that had to be proved.

In spite of these complications, the general nature of the formal correspondence which makes truth is clear from our instances. In the case of the simpler kind of propositions, namely those that I call "atomic" propositions, where there is only one word expressing a relation, the objective which would verify our proposition, assuming that the word "not" is absent, is obtained by replacing each word by what it means, the word meaning a relation being replaced by this relation among the meanings of the other words. For example, if the proposition is "Socrates precedes Plato," the objective which verifies it results from replacing the word "Socrates" by Socrates, the word "Plato" by Plato, and the word "precedes" by the relation of preceding between Socrates and Plato. If the result of this process is a fact, the proposition is true; if not, it is false. When our proposition is

"Socrates does not precede Plato," the conditions of truth and falsehood are exactly reversed. More complicated propositions can be dealt with on the same lines. In fact, the purely formal question, which has occupied us in this last section, offers no very formidable difficulties.

I do not believe that the above formal theory is untrue, but I do believe that it is inadequate. It does not, for example, throw any light upon our preference for true beliefs rather than false ones. This preference is only explicable by taking account of the causal efficacy of beliefs, and of the greater appropriateness of the responses resulting from true beliefs. But appropriateness depends upon purpose, and purpose thus becomes a vital part of theory of knowledge.