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CHAPTER 1

APPEARANCE AND REALITY

Is there any knowledge in the world which is so certain that no reasonable man could doubt it? This question, which at first sight might not seem difficult, is really one of the most difficult that can be asked. When we have realized the obstacles in the way of a straightforward and confident answer, we shall be well launched on the study of philosophy—for philosophy is merely the attempt to answer such ultimate questions, not carelessly and dogmatically, as we do in ordinary life and even in the sciences, but critically, after exploring all that makes such questions puzzling, and after realizing all the vagueness and confusion that underlie our ordinary ideas.

In daily life, we assume as certain many things which, on a closer scrutiny, are found to be so full of apparent contradictions that only a great amount of thought enables us to know what it is that we really may believe. In the search for certainty, it is natural to begin with our present experiences, and in some sense, no doubt, knowledge is to be derived from them. But any statement as to what it is that our immediate experiences make us know is very likely to be wrong. It seems to me that I am now sitting in a chair, at a table of a certain shape, on which I see sheets of paper with writing or print. By turning my head I see out of the window buildings and clouds and the sun. I believe that the sun is about ninety-three million miles from the earth; that it is a hot globe many times big-

ger than the earth; that, owing to the earth's rotation, it rises every morning, and will continue to do so for an indefinite time in the future. I believe that, if any other normal person comes into my room, he will see the same chairs and tables and books and papers as I see, and that the table which I see is the same as the table which I feel pressing against my arm. All this seems to be so evident as to be hardly worth stating, except in answer to a man who doubts whether I know anything. Yet all this may be reasonably doubted, and all of it requires much careful discussion before we can be sure that we have stated it in a form that is wholly true.

To make our difficulties plain, let us concentrate attention on the table. To the eye it is oblong, brown and shiny, to the touch it is smooth and cool and hard; when I tap it, it gives out a wooden sound. Any one else who sees and feels and hears the table will agree with this description, so that it might seem as if no difficulty would arise; but as soon as we try to be more precise our troubles begin. Although I believe that the table is 'really' of the same colour all over, the parts that reflect the light look much brighter than the other parts, and some parts look white because of reflected light. I know that, if I move, the parts that reflect the light will be different, so that the apparent distribution of colours on the table will change. It follows that if several people are looking at the table at the same moment, no two of them will see exactly the same distribution of colours, because no two can see it from exactly the same point of view, and any change in the point of view makes some change in the way the light is reflected.

For most practical purposes these differences are unimportant, but to the painter they are all-important: the painter has to unlearn the habit of thinking that things seem to have the colour which common sense says they 'really' have, and to learn the habit of seeing things as they appear. Here we have already the beginning of one of the distinctions that cause most trouble in philosophy—the distinction between 'appearance' and 'reality', between what things seem to be and what they are. The painter wants to know what

things seem to be, the practical man and the philosopher want to know what they are; but the philosopher's wish to know this is stronger than the practical man's, and is more troubled by knowledge as to the difficulties of answering the question.

To return to the table. It is evident from what we have found, that there is no colour which pre-eminently appears to be *the* colour of the table, or even of any one particular part of the table—it appears to be of different colours from different points of view, and there is no reason for regarding some of these as more really its colour than others. And we know that even from a given point of view the colour will seem different by artificial light, or to a colour-blind man, or to a man wearing blue spectacles, while in the dark there will be no colour at all, though to touch and hearing the table will be unchanged. This colour is not something which is inherent in the table, but something depending upon the table and the spectator and the way the light falls on the table. When, in ordinary life, we speak of *the* colour of the table, we only mean the sort of colour which it will seem to have to a normal spectator from an ordinary point of view under usual conditions of light. But the other colours which appear under other conditions have just as good a right to be considered real; and therefore, to avoid favouritism, we are compelled to deny that, in itself, the table has any one particular colour.

The same thing applies to the texture. With the naked eye one can see the grain, but otherwise the table looks smooth and even. If we looked at it through a microscope, we should see roughnesses and hills and valleys, and all sorts of differences that are imperceptible to the naked eye. Which of these is the 'real' table? We are naturally tempted to say that what we see through the microscope is more real, but that in turn would be changed by a still more powerful microscope. If, then, we cannot trust what we see with the naked eye, why should we trust what we see through a microscope? Thus, again, the confidence in our senses with which we began deserts us.

The shape of the table is no better. We are all in the habit of judging as to the 'real' shapes of things, and we do this so unreflectingly that we come to think we actually see the real shapes. But, in fact, as we all have to learn if we try to draw, a given thing looks different in shape from every different point of view. If our table is 'really' rectangular, it will look, from almost all points of view, as if it had two acute angles and two obtuse angles. If opposite sides are parallel, they will look as if they converged to a point away from the spectator; if they are of equal length, they will look as if the nearer side were longer. All these things are not commonly noticed in looking at a table, because experience has taught us to construct the 'real' shape from the apparent shape, and the 'real' shape is what interests us as practical men. But the 'real' shape is not what we see; it is something inferred from what we see. And what we see is constantly changing in shape as we move about the room; so that here again the senses seem not to give us the truth about the table itself, but only about the appearance of the table.

Similar difficulties arise when we consider the sense of touch. It is true that the table always gives us a sensation of hardness, and we feel that it resists pressure. But the sensation we obtain depends upon how hard we press the table and also upon what part of the body we press with; thus the various sensations due to various pressures or various parts of the body cannot be supposed to reveal *directly* any definite property of the table, but at most to be *signs* of some property which perhaps *causes* all the sensations, but is not actually apparent in any of them. And the same applies still more obviously to the sounds which can be elicited by rapping the table.

Thus it becomes evident that the real table, if there is one, is not the same as what we immediately experience by sight or touch or hearing. The real table, if there is one, is not *immediately* known to us at all, but must be an inference from what is immediately known. Hence, two very difficult questions at once arise; namely, (1) Is there a real table at all? (2) If so, what sort of object can it be?

It will help us in considering these questions to have a few simple terms of which the meaning is definite and clear. Let us give the name of 'sense-data' to the things that are immediately known in sensation: such things as colours, sounds, smells, hardnesses, roughnesses, and so on. We shall give the name 'sensation' to the experience of being immediately aware of these things. Thus, whenever we see a colour, we have a sensation *of* the colour, but the colour itself is a sense-datum, not a sensation. The colour is that *of* which we are immediately aware, and the awareness itself is the sensation. It is plain that if we are to know anything about the table, it must be by means of the sense-data—brown colour, oblong shape, smoothness, etc.—which we associate with the table; but, for the reasons which have been given, we cannot say that the table is the sense-data, or even that the sense-data are directly properties of the table. Thus a problem arises as to the relation of the sense-data to the real table, supposing there is such a thing.

The real table, if it exists, we will call a 'physical object'. Thus we have to consider the relation of sense-data to physical objects. The collection of all physical objects is called 'matter'. Thus our two questions may be re-stated as follows: (1) Is there any such thing as matter? (2) If so, what is its nature?

The philosopher who first brought prominently forward the reasons for regarding the immediate objects of our senses as not existing independently of us was Bishop Berkeley (1685-1753). His *Three Dialogues between Hylas and Philonous, in Opposition to Sceptics and Atheists*, undertake to prove that there is no such thing as matter at all, and that the world consists of nothing but minds and their ideas. Hylas has hitherto believed in matter, but he is no match for Philonous, who mercilessly drives him into contradictions and paradoxes, and makes his own denial of matter seem, in the end, as if it were almost common sense. The arguments employed are of very different value: some are important and sound, others are confused or quibbling. But Berkeley retains the merit of having shown that the existence of matter is capable

of being denied without absurdity, and that if there are any things that exist independently of us they cannot be the immediate objects of our sensations.

There are two different questions involved when we ask whether matter exists, and it is important to keep them clear. We commonly mean by 'matter' something which is opposed to 'mind', something which we think of as occupying space and as radically incapable of any sort of thought or consciousness. It is chiefly in this sense that Berkeley denies matter; that is to say, he does not deny that the sense-data which we commonly take as signs of the existence of the table are really signs of the existence of *something* independent of us, but he does deny that this something is non-mental, that it is neither mind nor ideas entertained by some mind. He admits that there must be something which continues to exist when we go out of the room or shut our eyes, and that what we call seeing the table does really give us reason for believing in something which persists even when we are not seeing it. But he thinks that this something cannot be radically different in nature from what we see, and cannot be independent of seeing altogether, though it must be independent of *our* seeing. He is thus led to regard the 'real' table as an idea in the mind of God. Such an idea has the required permanence and independence of ourselves, without being—as matter would otherwise be—something quite unknowable, in the sense that we can only infer it, and can never be directly and immediately aware of it.

Other philosophers since Berkeley have also held that, although the table does not depend for its existence upon being seen by me, it does depend upon being seen (or otherwise apprehended in sensation) by *some* mind—not necessarily the mind of God, but more often the whole collective mind of the universe. This they hold, as Berkeley does, chiefly because they think there can be nothing real—or at any rate nothing known to be real except minds and their thoughts and feelings. We might state the argument by which they support their view in some such way as this:

'Whatever can be thought of is an idea in the mind of the person thinking of it; therefore nothing can be thought of except ideas in minds; therefore anything else is inconceivable, and what is inconceivable cannot exist.'

Such an argument, in my opinion, is fallacious; and of course those who advance it do not put it so shortly or so crudely. But whether valid or not, the argument has been very widely advanced in one form or another; and very many philosophers, perhaps a majority, have held that there is nothing real except minds and their ideas. Such philosophers are called 'idealists'. When they come to explaining matter, they either say, like Berkeley, that matter is really nothing but a collection of ideas, or they say, like Leibniz (1646-1716), that what appears as matter is really a collection of more or less rudimentary minds.

But these philosophers, though they deny matter as opposed to mind, nevertheless, in another sense, admit matter. It will be remembered that we asked two questions; namely, (1) Is there a real table at all? (2) If so, what sort of object can it be? Now both Berkeley and Leibniz admit that there is a real table, but Berkeley says it is certain ideas in the mind of God, and Leibniz says it is a colony of souls. Thus both of them answer our first question in the affirmative, and only diverge from the views of ordinary mortals in their answer to our second question. In fact, almost all philosophers seem to be agreed that there is a real table: they almost all agree that, however much our sense-data—colour, shape, smoothness, etc.—may depend upon us, yet their occurrence is a sign of something existing independently of us, something differing, perhaps, completely from our sense-data, and yet to be regarded as causing those sense-data whenever we are in a suitable relation to the real table.

Now obviously this point in which the philosophers are agreed—the view that there *is* a real table, whatever its nature may be—is vitally important, and it will be worth while to consider what reasons there are for accepting this view before we go on to

the further question as to the nature of the real table. Our next chapter, therefore, will be concerned with the reasons for supposing that there is a real table at all.

Before we go farther it will be well to consider for a moment what it is that we have discovered so far. It has appeared that, if we take any common object of the sort that is supposed to be known by the senses, what the senses *immediately* tell us is not the truth about the object as it is apart from us, but only the truth about certain sense-data which, so far as we can see, depend upon the relations between us and the object. Thus what we directly see and feel is merely 'appearance', which we believe to be a sign of some 'reality' behind. But if the reality is not what appears, have we any means of knowing whether there is any reality at all? And if so, have we any means of finding out what it is like?

Such questions are bewildering, and it is difficult to know that even the strangest hypotheses may not be true. Thus our familiar table, which has roused but the slightest thoughts in us hitherto, has become a problem full of surprising possibilities. The one thing we know about it is that it is not what it seems. Beyond this modest result, so far, we have the most complete liberty of conjecture. Leibniz tells us it is a community of souls: Berkeley tells us it is an idea in the mind of God; sober science, scarcely less wonderful, tells us it is a vast collection of electric charges in violent motion.

Among these surprising possibilities, doubt suggests that perhaps there is no table at all. Philosophy, if it cannot *answer* so many questions as we could wish, has at least the power of *asking* questions which increase the interest of the world, and show the strangeness and wonder lying just below the surface even in the commonest things of daily life.

CHAPTER 2

THE EXISTENCE OF MATTER

In this chapter we have to ask ourselves whether, in any sense at all, there is such a thing as matter. Is there a table which has a certain intrinsic nature, and continues to exist when I am not looking, or is the table merely a product of my imagination, a dream-table in a very prolonged dream? This question is of the greatest importance. For if we cannot be sure of the independent existence of objects, we cannot be sure of the independent existence of other people's bodies, and therefore still less of other people's minds, since we have no grounds for believing in their minds except such as are derived from observing their bodies. Thus if we cannot be sure of the independent existence of objects, we shall be left alone in a desert—it may be that the whole outer world is nothing but a dream, and that we alone exist. This is an uncomfortable possibility; but although it cannot be strictly proved to be false, there is not the slightest reason to suppose that it is true. In this chapter we have to see why this is the case.

Before we embark upon doubtful matters, let us try to find some more or less fixed point from which to start. Although we are doubting the physical existence of the table, we are not doubting the existence of the sense-data which made us think there was a table; we are not doubting that, while we look, a certain colour and shape appear to us, and while we press, a certain sensation of hardness is experienced by us. All this, which is psychological, we

are not calling in question. In fact, whatever else may be doubtful, some at least of our immediate experiences seem absolutely certain.

Descartes (1596-1650), the founder of modern philosophy, invented a method which may still be used with profit—the method of systematic doubt. He determined that he would believe nothing which he did not see quite clearly and distinctly to be true. Whatever he could bring himself to doubt, he would doubt, until he saw reason for not doubting it. By applying this method he gradually became convinced that the only existence of which he could be *quite* certain was his own. He imagined a deceitful demon, who presented unreal things to his senses in a perpetual phantasmagoria; it might be very improbable that such a demon existed, but still it was possible, and therefore doubt concerning things perceived by the senses was possible.

But doubt concerning his own existence was not possible, for if he did not exist, no demon could deceive him. If he doubted, he must exist; if he had any experiences whatever, he must exist. Thus his own existence was an absolute certainty to him. 'I think, therefore I am,' he said (*Cogito, ergo sum*); and on the basis of this certainty he set to work to build up again the world of knowledge which his doubt had laid in ruins. By inventing the method of doubt, and by showing that subjective things are the most certain, Descartes performed a great service to philosophy, and one which makes him still useful to all students of the subject.

But some care is needed in using Descartes' argument. 'I think, therefore I am' says rather more than is strictly certain. It might seem as though we were quite sure of being the same person to-day as we were yesterday, and this is no doubt true in some sense. But the real Self is as hard to arrive at as the real table, and does not seem to have that absolute, convincing certainty that belongs to particular experiences. When I look at my table and see a certain brown colour, what is quite certain at once is not 'I am seeing a brown colour', but rather, 'a brown colour is being seen'. This of

course involves something (or somebody) which (or who) sees the brown colour; but it does not of itself involve that more or less permanent person whom we call 'I'. So far as immediate certainty goes, it might be that the something which sees the brown colour is quite momentary, and not the same as the something which has some different experience the next moment.

Thus it is our particular thoughts and feelings that have primitive certainty. And this applies to dreams and hallucinations as well as to normal perceptions: when we dream or see a ghost, we certainly do have the sensations we think we have, but for various reasons it is held that no physical object corresponds to these sensations. Thus the certainty of our knowledge of our own experiences does not have to be limited in any way to allow for exceptional cases. Here, therefore, we have, for what it is worth, a solid basis from which to begin our pursuit of knowledge.

The problem we have to consider is this: Granted that we are certain of our own sense-data, have we any reason for regarding them as signs of the existence of something else, which we can call the physical object? When we have enumerated all the sense-data which we should naturally regard as connected with the table, have we said all there is to say about the table, or is there still something else—something not a sense-datum, something which persists when we go out of the room? Common sense unhesitatingly answers that there is. What can be bought and sold and pushed about and have a cloth laid on it, and so on, cannot be a *mere* collection of sense-data. If the cloth completely hides the table, we shall derive no sense-data from the table, and therefore, if the table were merely sense-data, it would have ceased to exist, and the cloth would be suspended in empty air, resting, by a miracle, in the place where the table formerly was. This seems plainly absurd; but whoever wishes to become a philosopher must learn not to be frightened by absurdities.

One great reason why it is felt that we must secure a physical object in addition to the sense-data, is that we want the same object

for different people. When ten people are sitting round a dinner-table, it seems preposterous to maintain that they are not seeing the same tablecloth, the same knives and forks and spoons and glasses. But the sense-data are private to each separate person; what is immediately present to the sight of one is not immediately present to the sight of another: they all see things from slightly different points of view, and therefore see them slightly differently. Thus, if there are to be public neutral objects, which can be in some sense known to many different people, there must be something over and above the private and particular sense-data which appear to various people. What reason, then, have we for believing that there are such public neutral objects?

The first answer that naturally occurs to one is that, although different people may see the table slightly differently, still they all see more or less similar things when they look at the table, and the variations in what they see follow the laws of perspective and reflection of light, so that it is easy to arrive at a permanent object underlying all the different people's sense-data. I bought my table from the former occupant of my room; I could not buy *his* sense-data, which died when he went away, but I could and did buy the confident expectation of more or less similar sense-data. Thus it is the fact that different people have similar sense-data, and that one person in a given place at different times has similar sense-data, which makes us suppose that over and above the sense-data there is a permanent public object which underlies or causes the sense-data of various people at various times.

Now in so far as the above considerations depend upon supposing that there are other people besides ourselves, they beg the very question at issue. Other people are represented to me by certain sense-data, such as the sight of them or the sound of their voices, and if I had no reason to believe that there were physical objects independent of my sense-data, I should have no reason to believe that other people exist except as part of my dream. Thus, when we are trying to show that there must be objects independent

of our own sense-data, we cannot appeal to the testimony of other people, since this testimony itself consists of sense-data, and does not reveal other people's experiences unless our own sense-data are signs of things existing independently of us. We must therefore, if possible, find, in our own purely private experiences, characteristics which show, or tend to show, that there are in the world things other than ourselves and our private experiences.

In one sense it must be admitted that we can never prove the existence of things other than ourselves and our experiences. No logical absurdity results from the hypothesis that the world consists of myself and my thoughts and feelings and sensations, and that everything else is mere fancy. In dreams a very complicated world may seem to be present, and yet on waking we find it was a delusion; that is to say, we find that the sense-data in the dream do not appear to have corresponded with such physical objects as we should naturally infer from our sense-data. (It is true that, when the physical world is assumed, it is possible to find physical causes for the sense-data in dreams: a door banging, for instance, may cause us to dream of a naval engagement. But although, in this case, there is a physical cause for the sense-data, there is not a physical object corresponding to the sense-data in the way in which an actual naval battle would correspond.) There is no logical impossibility in the supposition that the whole of life is a dream, in which we ourselves create all the objects that come before us. But although this is not logically impossible, there is no reason whatever to suppose that it is true; and it is, in fact, a less simple hypothesis, viewed as a means of accounting for the facts of our own life, than the common-sense hypothesis that there really are objects independent of us, whose action on us causes our sensations.

The way in which simplicity comes in from supposing that there really are physical objects is easily seen. If the cat appears at one moment in one part of the room, and at another in another part, it is natural to suppose that it has moved from the one to

the other, passing over a series of intermediate positions. But if it is merely a set of sense-data, it cannot have ever been in any place where I did not see it; thus we shall have to suppose that it did not exist at all while I was not looking, but suddenly sprang into being in a new place. If the cat exists whether I see it or not, we can understand from our own experience how it gets hungry between one meal and the next; but if it does not exist when I am not seeing it, it seems odd that appetite should grow during non-existence as fast as during existence. And if the cat consists only of sense-data, it cannot be hungry, since no hunger but my own can be a sense-datum to me. Thus the behaviour of the sense-data which represent the cat to me, though it seems quite natural when regarded as an expression of hunger, becomes utterly inexplicable when regarded as mere movements and changes of patches of colour, which are as incapable of hunger as a triangle is of playing football.

But the difficulty in the case of the cat is nothing compared to the difficulty in the case of human beings. When human beings speak—that is, when we hear certain noises which we associate with ideas, and simultaneously see certain motions of lips and expressions of face—it is very difficult to suppose that what we hear is not the expression of a thought, as we know it would be if we emitted the same sounds. Of course similar things happen in dreams, where we are mistaken as to the existence of other people. But dreams are more or less suggested by what we call waking life, and are capable of being more or less accounted for on scientific principles if we assume that there really is a physical world. Thus every principle of simplicity urges us to adopt the natural view, that there really are objects other than ourselves and our sense-data which have an existence not dependent upon our perceiving them.

Of course it is not by argument that we originally come by our belief in an independent external world. We find this belief ready in ourselves as soon as we begin to reflect: it is what may be called

an *instinctive* belief. We should never have been led to question this belief but for the fact that, at any rate in the case of sight, it seems as if the sense-datum itself were instinctively believed to be the independent object, whereas argument shows that the object cannot be identical with the sense-datum. This discovery, however—which is not at all paradoxical in the case of taste and smell and sound, and only slightly so in the case of touch—leaves undiminished our instinctive belief that there *are* objects *corresponding* to our sense-data. Since this belief does not lead to any difficulties, but on the contrary tends to simplify and systematize our account of our experiences, there seems no good reason for rejecting it. We may therefore admit—though with a slight doubt derived from dreams—that the external world does really exist, and is not wholly dependent for its existence upon our continuing to perceive it.

The argument which has led us to this conclusion is doubtless less strong than we could wish, but it is typical of many philosophical arguments, and it is therefore worth while to consider briefly its general character and validity. All knowledge, we find, must be built up upon our instinctive beliefs, and if these are rejected, nothing is left. But among our instinctive beliefs some are much stronger than others, while many have, by habit and association, become entangled with other beliefs, not really instinctive, but falsely supposed to be part of what is believed instinctively.

Philosophy should show us the hierarchy of our instinctive beliefs, beginning with those we hold most strongly, and presenting each as much isolated and as free from irrelevant additions as possible. It should take care to show that, in the form in which they are finally set forth, our instinctive beliefs do not clash, but form a harmonious system. There can never be any reason for rejecting one instinctive belief except that it clashes with others; thus, if they are found to harmonize, the whole system becomes worthy of acceptance.

It is of course *possible* that all or any of our beliefs may be mistaken, and therefore all ought to be held with at least some

slight element of doubt. But we cannot have *reason* to reject a belief except on the ground of some other belief. Hence, by organizing our instinctive beliefs and their consequences, by considering which among them is most possible, if necessary, to modify or abandon, we can arrive, on the basis of accepting as our sole data what we instinctively believe, at an orderly systematic organization of our knowledge, in which, though the *possibility* of error remains, its likelihood is diminished by the interrelation of the parts and by the critical scrutiny which has preceded acquiescence.

This function, at least, philosophy can perform. Most philosophers, rightly or wrongly, believe that philosophy can do much more than this—that it can give us knowledge, not otherwise attainable, concerning the universe as a whole, and concerning the nature of ultimate reality. Whether this be the case or not, the more modest function we have spoken of can certainly be performed by philosophy, and certainly suffices, for those who have once begun to doubt the adequacy of common sense, to justify the arduous and difficult labours that philosophical problems involve.

CHAPTER 7

ON OUR KNOWLEDGE OF GENERAL PRINCIPLES

We saw in the preceding chapter that the principle of induction, while necessary to the validity of all arguments based on experience, is itself not capable of being proved by experience, and yet is unhesitatingly believed by every one, at least in all its concrete applications. In these characteristics the principle of induction does not stand alone. There are a number of other principles which cannot be proved or disproved by experience, but are used in arguments which start from what is experienced.

Some of these principles have even greater evidence than the principle of induction, and the knowledge of them has the same degree of certainty as the knowledge of the existence of sense-data. They constitute the means of drawing inferences from what is given in sensation; and if what we infer is to be true, it is just as necessary that our principles of inference should be true as it is that our data should be true. The principles of inference are apt to be overlooked because of their very obviousness—the assumption involved is assented to without our realizing that it is an assumption. But it is very important to realize the use of principles of inference, if a correct theory of knowledge is to be obtained; for our knowledge of them raises interesting and difficult questions.

In all our knowledge of general principles, what actually happens is that first of all we realize some particular application of the

principle, and then we realize that the particularity is irrelevant, and that there is a generality which may equally truly be affirmed. This is of course familiar in such matters as teaching arithmetic: 'two and two are four' is first learnt in the case of some particular pair of couples, and then in some other particular case, and so on, until at last it becomes possible to see that it is true of any pair of couples. The same thing happens with logical principles. Suppose two men are discussing what day of the month it is. One of them says, 'At least you will admit that *if* yesterday was the 15th to-day must be the 16th.' 'Yes', says the other, 'I admit that.' 'And you know', the first continues, 'that yesterday was the 15th, because you dined with Jones, and your diary will tell you that was on the 15th.' 'Yes', says the second; 'therefore to-day *is* the 16th.'

Now such an argument is not hard to follow; and if it is granted that its premisses are true in fact, no one will deny that the conclusion must also be true. But it depends for its truth upon an instance of a general logical principle. The logical principle is as follows: 'Suppose it known that *if* this is true, then that is true. Suppose it also known that this *is* true, then it follows that that is true.' When it is the case that if this is true, that is true, we shall say that this 'implies' that, and that that 'follows from' this. Thus our principle states that if this implies that, and this is true, then that is true. In other words, 'anything implied by a true proposition is true', or 'whatever follows from a true proposition is true'.

This principle is really involved—at least, concrete instances of it are involved—in all demonstrations. Whenever one thing which we believe is used to prove something else, which we consequently believe, this principle is relevant. If any one asks: 'Why should I accept the results of valid arguments based on true premisses?' we can only answer by appealing to our principle. In fact, the truth of the principle is impossible to doubt, and its obviousness is so great that at first sight it seems almost trivial. Such principles, however, are not trivial to the philosopher, for they show that we may have

indubitable knowledge which is in no way derived from objects of sense.

The above principle is merely one of a certain number of self-evident logical principles. Some at least of these principles must be granted before any argument or proof becomes possible. When some of them have been granted, others can be proved, though these others, so long as they are simple, are just as obvious as the principles taken for granted. For no very good reason, three of these principles have been singled out by tradition under the name of 'Laws of Thought'.

They are as follows:

1. *The law of identity*: 'Whatever is, is.'
2. *The law of contradiction*: 'Nothing can both be and not be.'
3. *The law of excluded middle*: 'Everything must either be or not be.'

These three laws are samples of self-evident logical principles, but are not really more fundamental or more self-evident than various other similar principles: for instance, the one we considered just now, which states that what follows from a true premiss is true. The name 'laws of thought' is also misleading, for what is important is not the fact that we think in accordance with these laws, but the fact that things behave in accordance with them; in other words, the fact that when we think in accordance with them we think *truly*. But this is a large question, to which we must return at a later stage.

In addition to the logical principles which enable us to prove from a given premiss that something is *certainly* true, there are other logical principles which enable us to prove, from a given premiss, that there is a greater or less probability that something is true. An example of such principles—perhaps the most important example is the inductive principle, which we considered in the preceding chapter.

One of the great historic controversies in philosophy is the controversy between the two schools called respectively 'empiricists' and 'rationalists'. The empiricists—who are best represented by the British philosophers, Locke, Berkeley, and Hume—maintained that all our knowledge is derived from experience; the rationalists—who are represented by the Continental philosophers of the seventeenth century, especially Descartes and Leibniz—maintained that, in addition to what we know by experience, there are certain 'innate ideas' and 'innate principles', which we know independently of experience. It has now become possible to decide with some confidence as to the truth or falsehood of these opposing schools. It must be admitted, for the reasons already stated, that logical principles are known to us, and cannot be themselves proved by experience, since all proof presupposes them. In this, therefore, which was the most important point of the controversy, the rationalists were in the right.

On the other hand, even that part of our knowledge which is *logically* independent of experience (in the sense that experience cannot prove it) is yet elicited and caused by experience. It is on occasion of particular experiences that we become aware of the general laws which their connexions exemplify. It would certainly be absurd to suppose that there are innate principles in the sense that babies are born with a knowledge of everything which men know and which cannot be deduced from what is experienced. For this reason, the word 'innate' would not now be employed to describe our knowledge of logical principles. The phrase '*a priori*' is less objectionable, and is more usual in modern writers. Thus, while admitting that all knowledge is elicited and caused by experience, we shall nevertheless hold that some knowledge is *a priori*, in the sense that the experience which makes us think of it does not suffice to prove it, but merely so directs our attention that we see its truth without requiring any proof from experience.

There is another point of great importance, in which the empiricists were in the right as against the rationalists. Nothing

can be known to *exist* except by the help of experience. That is to say, if we wish to prove that something of which we have no direct experience exists, we must have among our premisses the existence of one or more things of which we have direct experience. Our belief that the Emperor of China exists, for example, rests upon testimony, and testimony consists, in the last analysis, of sense-data seen or heard in reading or being spoken to. Rationalists believed that, from general consideration as to what must be, they could deduce the existence of this or that in the actual world. In this belief they seem to have been mistaken. All the knowledge that we can acquire *a priori* concerning existence seems to be hypothetical: it tells us that if one thing exists, another must exist, or, more generally, that if one proposition is true, another must be true. This is exemplified by the principles we have already dealt with, such as 'if this is true, and this implies that, then that is true', or 'if this and that have been repeatedly found connected, they will probably be connected in the next instance in which one of them is found'. Thus the scope and power of *a priori* principles is strictly limited. All knowledge that something exists must be in part dependent on experience. When anything is known immediately, its existence is known by experience alone; when anything is proved to exist, without being known immediately, both experience and *a priori* principles must be required in the proof. Knowledge is called *empirical* when it rests wholly or partly upon experience. Thus all knowledge which asserts existence is empirical, and the only *a priori* knowledge concerning existence is hypothetical, giving connexions among things that exist or may exist, but not giving actual existence.

A priori knowledge is not all of the logical kind we have been hitherto considering. Perhaps the most important example of non-logical *a priori* knowledge is knowledge as to ethical value. I am not speaking of judgements as to what is useful or as to what is virtuous, for such judgements do require empirical premisses; I am speaking of judgements as to the intrinsic desirability of things. If

something is useful, it must be useful because it secures some end; the end must, if we have gone far enough, be valuable on its own account, and not merely because it is useful for some further end. Thus all judgements as to what is useful depend upon judgements as to what has value on its own account.

We judge, for example, that happiness is more desirable than misery, knowledge than ignorance, goodwill than hatred, and so on. Such judgements must, in part at least, be immediate and *a priori*. Like our previous *a priori* judgements, they may be elicited by experience, and indeed they must be; for it seems not possible to judge whether anything is intrinsically valuable unless we have experienced something of the same kind. But it is fairly obvious that they cannot be proved by experience; for the fact that a thing exists or does not exist cannot prove either that it is good that it should exist or that it is bad. The pursuit of this subject belongs to ethics, where the impossibility of deducing what ought to be from what is has to be established. In the present connexion, it is only important to realize that knowledge as to what is intrinsically of value is *a priori* in the same sense in which logic is *a priori*, namely in the sense that the truth of such knowledge can be neither proved nor disproved by experience.

All pure mathematics is *a priori*, like logic. This was strenuously denied by the empirical philosophers, who maintained that experience was as much the source of our knowledge of arithmetic as of our knowledge of geography. They maintained that by the repeated experience of seeing two things and two other things, and finding that altogether they made four things, we were led by induction to the conclusion that two things and two other things would *always* make four things altogether. If, however, this were the source of our knowledge that two and two are four, we should proceed differently, in persuading ourselves of its truth, from the way in which we do actually proceed. In fact, a certain number of instances are needed to make us think of two abstractly, rather than of two coins or two books or two people, or two of any other

specified kind. But as soon as we are able to divest our thoughts of irrelevant particularity, we become able to see the general principle that two and two are four; any one instance is seen to be *typical*, and the examination of other instances becomes unnecessary.¹

The same thing is exemplified in geometry. If we want to prove some property of *all* triangles, we draw some one triangle and reason about it; but we can avoid making use of any property which it does not share with all other triangles, and thus, from our particular case, we obtain a general result. We do not, in fact, feel our certainty that two and two are four increased by fresh instances, because, as soon as we have seen the truth of this proposition, our certainty becomes so great as to be incapable of growing greater. Moreover, we feel some quality of necessity about the proposition 'two and two are four', which is absent from even the best attested empirical generalizations. Such generalizations always remain mere facts: we feel that there might be a world in which they were false, though in the actual world they happen to be true. In any possible world, on the contrary, we feel that two and two would be four: this is not a mere fact, but a necessity to which everything actual and possible must conform.

The case may be made clearer by considering a genuinely-empirical generalization, such as 'All men are mortal.' It is plain that we believe this proposition, in the first place, because there is no known instance of men living beyond a certain age, and in the second place because there seem to be physiological grounds for thinking that an organism such as a man's body must sooner or later wear out. Neglecting the second ground, and considering merely our experience of men's mortality, it is plain that we should not be content with one quite clearly understood instance of a man dying, whereas, in the case of 'two and two are four', one instance does suffice, when carefully considered, to persuade us that the same must happen in any other instance. Also we can be forced to admit, on reflection, that there may be some doubt, however slight,

1. Cf. A. N. Whitehead, *Introduction to Mathematics* (Home University Library).

as to whether *all* men are mortal. This may be made plain by the attempt to imagine two different worlds, in one of which there are men who are not mortal, while in the other two and two make five. When Swift invites us to consider the race of Struldbugs who never die, we are able to acquiesce in imagination. But a world where two and two make five seems quite on a different level. We feel that such a world, if there were one, would upset the whole fabric of our knowledge and reduce us to utter doubt.

The fact is that, in simple mathematical judgements such as 'two and two are four', and also in many judgements of logic, we can know the general proposition without inferring it from instances, although some instance is usually necessary to make clear to us what the general proposition means. This is why there is real utility in the process of *deduction*, which goes from the general to the general, or from the general to the particular, as well as in the process of *induction*, which goes from the particular to the particular, or from the particular to the general. It is an old debate among philosophers whether deduction ever gives *new* knowledge. We can now see that in certain cases, at least, it does do so. If we already know that two and two always make four, and we know that Brown and Jones are two, and so are Robinson and Smith, we can deduce that Brown and Jones and Robinson and Smith are four. This is new knowledge, not contained in our premisses, because the general proposition, 'two and two are four', never told us there were such people as Brown and Jones and Robinson and Smith, and the particular premisses do not tell us that there were four of them, whereas the particular proposition deduced does tell us both these things.

But the newness of the knowledge is much less certain if we take the stock instance of deduction that is always given in books on logic, namely, 'All men are mortal; Socrates is a man, therefore Socrates is mortal.' In this case, what we really know beyond reasonable doubt is that certain men, A, B, C, were mortal, since, in fact, they have died. If Socrates is one of these men, it is foolish to

go the roundabout way through 'all men are mortal' to arrive at the conclusion that *probably* Socrates is mortal. If Socrates is not one of the men on whom our induction is based, we shall still do better to argue straight from our A, B, C, to Socrates, than to go round by the general proposition, 'all men are mortal'. For the probability that Socrates is mortal is greater, on our data, than the probability that all men are mortal. (This is obvious, because if all men are mortal, so is Socrates; but if Socrates is mortal, it does not follow that all men are mortal.) Hence we shall reach the conclusion that Socrates is mortal with a greater approach to certainty if we make our argument purely inductive than if we go by way of 'all men are mortal' and then use deduction.

This illustrates the difference between general propositions known *a priori* such as 'two and two are four', and empirical generalizations such as 'all men are mortal'. In regard to the former, deduction is the right mode of argument, whereas in regard to the latter, induction is always theoretically preferable, and warrants a greater confidence in the truth of our conclusion, because all empirical generalizations are more uncertain than the instances of them.

We have now seen that there are propositions known *a priori*, and that among them are the propositions of logic and pure mathematics, as well as the fundamental propositions of ethics. The question which must next occupy us is this: How is it possible that there should be such knowledge? And more particularly, how can there be knowledge of general propositions in cases where we have not examined all the instances, and indeed never can examine them all, because their number is infinite? These questions, which were first brought prominently forward by the German philosopher Kant (1724-1804), are very difficult, and historically very important.

CHAPTER 8

A PRIORI KNOWLEDGE IS POSSIBLE

Immanuel Kant is generally regarded as the greatest of the modern philosophers. Though he lived through the Seven Years War and the French Revolution, he never interrupted his teaching of philosophy at Königsberg in East Prussia. His most distinctive contribution was the invention of what he called the ‘critical’ philosophy, which, assuming as a datum that there is knowledge of various kinds, inquired how such knowledge comes to be possible, and deduced, from the answer to this inquiry, many metaphysical results as to the nature of the world. Whether these results were valid may well be doubted. But Kant undoubtedly deserves credit for two things: first, for having perceived that we have *a priori* knowledge which is not purely ‘analytic’, i.e. such that the opposite would be self-contradictory, and secondly, for having made evident the philosophical importance of the theory of knowledge.

Before the time of Kant, it was generally held that whatever knowledge was *a priori* must be ‘analytic’. What this word means will be best illustrated by examples. If I say, ‘A bald man is a man’, ‘A plane figure is a figure’, ‘A bad poet is a poet’, I make a purely analytic judgement: the subject spoken about is given as having at least two properties, of which one is singled out to be asserted of it. Such propositions as the above are trivial, and would never be enunciated in real life except by an orator preparing the way for

a piece of sophistry. They are called 'analytic' because the predicate is obtained by merely analysing the subject. Before the time of Kant it was thought that all judgements of which we could be certain *a priori* were of this kind: that in all of them there was a predicate which was only part of the subject of which it was asserted. If this were so, we should be involved in a definite contradiction if we attempted to deny anything that could be known *a priori*. 'A bald man is not bald' would assert and deny baldness of the same man, and would therefore contradict itself. Thus according to the philosophers before Kant, the law of contradiction, which asserts that nothing can at the same time have and not have a certain property, sufficed to establish the truth of all *a priori* knowledge.

Hume (1711-76), who preceded Kant, accepting the usual view as to what makes knowledge *a priori*, discovered that, in many cases which had previously been supposed analytic, and notably in the case of cause and effect, the connexion was really synthetic. Before Hume, rationalists at least had supposed that the effect could be logically deduced from the cause, if only we had sufficient knowledge. Hume argued—correctly, as would now be generally admitted—that this could not be done. Hence he inferred the far more doubtful proposition that nothing could be known *a priori* about the connexion of cause and effect. Kant, who had been educated in the rationalist tradition, was much perturbed by Hume's scepticism, and endeavoured to find an answer to it. He perceived that not only the connexion of cause and effect, but all the propositions of arithmetic and geometry, are 'synthetic', i.e. not analytic: in all these propositions, no analysis of the subject will reveal the predicate. His stock instance was the proposition $7 + 5 = 12$. He pointed out, quite truly, that 7 and 5 have to be put together to give 12: the idea of 12 is not contained in them, nor even in the idea of adding them together. Thus he was led to the conclusion that all pure mathematics, though *a priori*, is synthetic; and this conclusion raised a new problem of which he endeavoured to find the solution.

The question which Kant put at the beginning of his philosophy, namely 'How is pure mathematics possible?' is an interesting and difficult one, to which every philosophy which is not purely sceptical must find some answer. The answer of the pure empiricists, that our mathematical knowledge is derived by induction from particular instances, we have already seen to be inadequate, for two reasons: first, that the validity of the inductive principle itself cannot be proved by induction; secondly, that the general propositions of mathematics, such as 'two and two always make four', can obviously be known with certainty by consideration of a single instance, and gain nothing by enumeration of other cases in which they have been found to be true. Thus our knowledge of the general propositions of mathematics (and the same applies to logic) must be accounted for otherwise than our (merely probable) knowledge of empirical generalizations such as 'all men are mortal'.

The problem arises through the fact that such knowledge is general, whereas all experience is particular. It seems strange that we should apparently be able to know some truths in advance about particular things of which we have as yet no experience; but it cannot easily be doubted that logic and arithmetic will apply to such things. We do not know who will be the inhabitants of London a hundred years hence; but we know that any two of them and any other two of them will make four of them. This apparent power of anticipating facts about things of which we have no experience is certainly surprising. Kant's solution of the problem, though not valid in my opinion, is interesting. It is, however, very difficult, and is differently understood by different philosophers. We can, therefore, only give the merest outline of it, and even that will be thought misleading by many exponents of Kant's system.

What Kant maintained was that in all our experience there are two elements to be distinguished, the one due to the object (i.e. to what we have called the 'physical object'), the other due to our own nature. We saw, in discussing matter and sense-data, that the

physical object is different from the associated sense-data, and that the sense-data are to be regarded as resulting from an interaction between the physical object and ourselves. So far, we are in agreement with Kant. But what is distinctive of Kant is the way in which he apportions the shares of ourselves and the physical object respectively. He considers that the crude material given in sensation—the colour, hardness, etc.—is due to the object, and that what we supply is the arrangement in space and time, and all the relations between sense-data which result from comparison or from considering one as the cause of the other or in any other way. His chief reason in favour of this view is that we seem to have a *priori* knowledge as to space and time and causality and comparison, but not as to the actual crude material of sensation. We can be sure, he says, that anything we shall ever experience must show the characteristics affirmed of it in our *a priori* knowledge, because these characteristics are due to our own nature, and therefore nothing can ever come into our experience without acquiring these characteristics.

The physical object, which he calls the 'thing in itself',¹ he regards as essentially unknowable; what can be known is the object as we have it in experience, which he calls the 'phenomenon'. The phenomenon, being a joint product of us and the thing in itself, is sure to have those characteristics which are due to us, and is therefore sure to conform to our *a priori* knowledge. Hence this knowledge, though true of all actual and possible experience, must not be supposed to apply outside experience. Thus in spite of the existence of *a priori* knowledge, we cannot know anything about the thing in itself or about what is not an actual or possible object of experience. In this way he tries to reconcile and harmonize the

1. Kant's 'thing in itself' is identical in *definition* with the physical object, namely, it is the cause of sensations. In the properties deduced from the definition it is not identical, since Kant held (in spite of some inconsistency as regards cause) that we can know that none of the categories are applicable to the 'thing in itself'.

contentions of the rationalists with the arguments of the empiricists.

Apart from minor grounds on which Kant's philosophy may be criticized, there is one main objection which seems fatal to any attempt to deal with the problem of *a priori* knowledge by his method. The thing to be accounted for is our certainty that the facts must always conform to logic and arithmetic. To say that logic and arithmetic are contributed by us does not account for this. Our nature is as much a fact of the existing world as anything, and there can be no certainty that it will remain constant. It might happen, if Kant is right, that to-morrow our nature would so change as to make two and two become five. This possibility seems never to have occurred to him, yet it is one which utterly destroys the certainty and universality which he is anxious to vindicate for arithmetical propositions. It is true that this possibility, formally, is inconsistent with the Kantian view that time itself is a form imposed by the subject upon phenomena, so that our real Self is not in time and has no to-morrow. But he will still have to suppose that the time-order of phenomena is determined by characteristics of what is behind phenomena, and this suffices for the substance of our argument.

Reflection, moreover, seems to make it clear that, if there is any truth in our arithmetical beliefs, they must apply to things equally whether we think of them or not. Two physical objects and two other physical objects must make four physical objects, even if physical objects cannot be experienced. To assert this is certainly within the scope of what we mean when we state that two and two are four. Its truth is just as indubitable as the truth of the assertion that two phenomena and two other phenomena make four phenomena. Thus Kant's solution unduly limits the scope of *a priori* propositions, in addition to failing in the attempt at explaining their certainty.

Apart from the special doctrines advocated by Kant, it is very common among philosophers to regard what is *a priori* as in some

sense mental, as concerned rather with the way we must think than with any fact of the outer world. We noted in the preceding chapter the three principles commonly called 'laws of thought'. The view which led to their being so named is a natural one, but there are strong reasons for thinking that it is erroneous. Let us take as an illustration the law of contradiction. This is commonly stated in the form 'Nothing can both be and not be', which is intended to express the fact that nothing can at once have and not have a given quality. Thus, for example, if a tree is a beech it cannot also be not a beech; if my table is rectangular it cannot also be not rectangular, and so on.

Now what makes it natural to call this principle a law of *thought* is that it is by thought rather than by outward observation that we persuade ourselves of its necessary truth. When we have seen that a tree is a beech, we do not need to look again in order to ascertain whether it is also not a beech; thought alone makes us know that this is impossible. But the conclusion that the law of contradiction is a law of *thought* is nevertheless erroneous. What we believe, when we believe the law of contradiction, is not that the mind is so made that it must believe the law of contradiction. *This* belief is a subsequent result of psychological reflection, which presupposes the belief in the law of contradiction. The belief in the law of contradiction is a belief about things, not only about thoughts. It is not, e.g., the belief that if we *think* a certain tree is a beech, we cannot at the same time *think* that it is not a beech; it is the belief that if the tree *is* a beech, it cannot at the same time *be* not a beech. Thus the law of contradiction is about things, and not merely about thoughts; and although belief in the law of contradiction is a thought, the law of contradiction itself is not a thought, but a fact concerning the things in the world. If this, which we believe when we believe the law of contradiction, were not true of the things in the world, the fact that we were compelled to *think* it true would not save the law of contradiction from being false; and this shows that the law is not a law of *thought*.

A similar argument applies to any other *a priori* judgement. When we judge that two and two are four, we are not making a judgement about our thoughts, but about all actual or possible couples. The fact that our minds are so constituted as to believe that two and two are four, though it is true, is emphatically not what we assert when we assert that two and two are four. And no fact about the constitution of our minds could make it *true* that two and two are four. Thus our *a priori* knowledge, if it is not erroneous, is not merely knowledge about the constitution of our minds, but is applicable to whatever the world may contain, both what is mental and what is non-mental.

The fact seems to be that all our *a priori* knowledge is concerned with entities which do not, properly speaking, *exist*, either in the mental or in the physical world. These entities are such as can be named by parts of speech which are not substantives; they are such entities as qualities and relations. Suppose, for instance, that I am in my room. I exist, and my room exists; but does 'in' exist? Yet obviously the word 'in' has a meaning; it denotes a relation which holds between me and my room. This relation is something, although we cannot say that it exists *in the same sense* in which I and my room exist. The relation 'in' is something which we can think about and understand, for, if we could not understand it, we could not understand the sentence 'I am in my room'. Many philosophers, following Kant, have maintained that relations are the work of the mind, that things in themselves have no relations, but that the mind brings them together in one act of thought and thus produces the relations which it judges them to have.

This view, however, seems open to objections similar to those which we urged before against Kant. It seems plain that it is not thought which produces the truth of the proposition 'I am in my room'. It may be true that an earwig is in my room, even if neither I nor the earwig nor any one else is aware of this truth; for this truth concerns only the earwig and the room, and does not depend upon anything else. Thus relations, as we shall see more fully in the next

chapter, must be placed in a world which is neither mental nor physical. This world is of great importance to philosophy, and in particular to the problems of *a priori* knowledge. In the next chapter we shall proceed to develop its nature and its bearing upon the questions with which we have been dealing.