pure. The sources of knowledge must be kept pure, because any impurity may become a source of ignorance.

X

In spite of the religious character of their epistemologies, Bacon's and Descartes' attacks upon prejudice, and upon traditional beliefs which we carelessly or recklessly harbour, are in tendency clearly anti-authoritarian and anti-traditionalist. For they require us to shed all beliefs except those whose truth we have perceived ourselves. Thus their attacks were intended to be attacks upon authority and tradition: they were part of the war against authority which it was the fashion of the time to wage, the war against the authority of Aristotle and the tradition of the schools. Men do not need such authorities if they can perceive the truth themselves.

But I do not think that Bacon and Descartes succeeded in freeing their epistemologies from authority; not so much because they appealed to religious authority—to Nature or to God—but for an even deeper reason.

In spite of their individualistic tendencies, they did not dare to appeal to our critical judgement—to your judgement, or to mine; perhaps because they felt that this might lead to subjectivism and to arbitrariness. Yet whatever the reason may have been, they certainly were unable to give up thinking in terms of authority, much as they wanted to do so. They could only replace one authority—that of Aristotle and the Bible—by another. Each of them appealed to a new authority; the one to *the authority of the senses*, and the other to *the authority of the intellect*.

This means that they failed to solve the great problem: How can we admit that our knowledge is a human—an all too human—affair, without at the same time implying that it is all individual whim and arbitrariness?

Yet this problem had been seen and solved long before; first, it appears, by Xenophanes, and then by Democritus, and by Socrates (the Socrates of the *Apology* rather than of the *Meno*). The solution lies in the realization that all of us may and often

do err, singly and collectively, but that this very idea of error and human fallibility involves another one: the idea of *objective truth*: the standard which we may fall short of. Thus the doctrine of fallibility should not be regarded as part of a pessimistic epistemology. This doctrine implies that we may seek for truth, for objective truth, though more often than not we may miss it by a wide margin. And it implies that if we respect truth, we must search for it by persistently searching for our errors: by indefatigable rational criticism, and self-criticism.

Erasmus of Rotterdam attempted to revive this Socratic doctrine—the important though unobtrusive doctrine, 'Know thyself, and thus admit to thyself how little thou knowest!'. Yet this doctrine was swept away by the belief that truth is manifest, and by the new self-assurance exemplified and taught in different ways by Luther and Calvin, by Bacon and Descartes.

It is important to realize, in this connexion, the difference between Cartesian doubt and the doubt of Socrates, or Erasmus, or Montaigne. While Socrates doubts human knowledge or wisdom, and remains firm in his rejection of any pretension to knowledge or wisdom, Descartes doubts everything —but only to end up with the possession of *absolutely certain* knowledge; for he finds that his universal doubt would lead him to doubt the truthfulness of God, which is absurd. Having proved that universal doubt is absurd, he concludes that we *can* know securely, that we *can* be wise, if only we distinguish conscientiously, in the natural light of reason, between clear and distinct ideas whose source is God, and all other ideas whose source is our own impure imagination. Cartesian doubt, we see, is merely a *maieutic* instrument for establishing a criterion of truth and, with it, a way to secure knowledge and wisdom. Yet for the Socrates of the *Apology*, wisdom consisted in the awareness of our limitations; in knowing how little we know, every one of us.

It was this doctrine of an essential human fallibility which Nicolas of Cusa and Erasmus of Rotterdam (who refers to Socrates) revived; and it was this 'humanist' doctrine (in

contradistinction to the optimistic doctrine on which Milton relied, the doctrine that truth will prevail) which Nicolas-and Erasmus, Montaigne and Locke and Voltaire, followed by John Stuart Mill and Bertrand Russell, made the basis of the doctrine of tolerance. 'What is tolerance?' asks Voltaire in his *Philosophical Dictionary*; and he answers: 'It is a necessary consequence of our humanity. We are all fallible, and prone to error; let us then pardon each other's folly. This is the first principle of natural right.' (More recently the doctrine of fallibility has been made the basis of a theory of political freedom; that is, freedom from coercion.[30])

XI

Bacon and Descartes set up observation and reason as new authorities, and they set them up within each individual man. But in doing so they split man into two parts, into a higher part which has authority with respect to truth—Bacon's observations, Descartes' intellect—and a lower part. It is this lower part which constitutes our ordinary selves, the old Adam in us. For it is always 'we ourselves' who are alone responsible for error, if truth is manifest. It is we, with *our* prejudices, *our* negligence, *our* pigheadedness, who are to blame; it is we ourselves who are the sources of our ignorance.

Thus we are split into a human part, we ourselves, the part which is the source of our fallible opinions (*doxa*), of our errors, and of our ignorance; and a super-human part, such as the senses or the intellect, the part which is the source of real knowledge (*epistēmē*), and which has an almost divine authority over us.

But this will not do. For we know that Descartes' physics, admirable as it was in many ways, was mistaken; yet it was based only upon ideas which, he thought, were clear and distinct, and which therefore should have been true. And as to the authority of the senses as sources of knowledge, the fact that the senses were not reliable seems to have been known to

[30] See F. A. von Hayek, *The Constitution of Liberty*, 1960, especially pp. 22 and 29.

Xenophanes[31] and to Heraclitus[32]; at any rate, with Parmenides it became one of the foundations of Eleatic thought. According to Parmenides, reliance on the senses is one of the two main sources of ignorance or delusion (the other is conventional language—the misguided convention of giving names to the non-existent; see section VII above). For he teaches that whatever is contained in our much-erring sense organs will appear in the form of a 'thought' to the erring intellect of mortal men:[33]

[31] See DK Xenophanes B 18 and 34 (quoted below in section XV); it is important that Xenophanes teaches that the knowledge of mortal men is only guesswork, *doxa*, and so prepares for the contempt shown by Heraclitus and Parmenides for the opinion of ordinary mortal men—a contempt which may have provoked Protagoras to turn the tables upon them.

[32] See for anti-sensualist or pro-intellectualist allusions in Heraclitus for example DK, Heraclitus B 46 and 54 (also B 8 and 51); 123 (also B 8 and 56), all discussed in *Conjectures and Refutations*. In addition see B 107, 'eyes and ears are false witnesses . . .' (false witnesses are also alluded to in B 28; cp. also 101a which in view of B 19 probably means only: 'eyewitnesses are better than hearsay'). See also B 41: 'wisdom is knowing the *thought* [that is, the *logos*: see *pantōn kata ton logon* in B 1] that steers everything through everything'.

[33] Cp. DK, Parmenides, B 16. The passage is translated and commented upon in the second edition of my *Conjectures and Refutations*, pp. 164 f. Crucial for my translation (which, like almost all translations, is an interpretation) are two points: (1) '*poluplanktos*' means here 'much-erring' rather than 'wandering' (Kirk and Raven) or 'changing' (Tarán, op. cit.) or 'straying' (Guthrie, op.cit.). My arguments are (*a*) the accepted general tendency of Parmenides; (*b*) that '*plakton noon*' in B 6:6 means 'erring thought' (or 'erring mind': Guthrie, p. 21; not 'wandering', as in Tarán, or Kirk and Raven); (*c*) that '*plattontai*' (Diels-Kranz = *plazontai*) in B 6:5 also means 'err (helplessly)', or 'stray' and not merely 'wander'; it is 'typically used for an intellectual error' (Tarán, p. 63); (*d*) that '*peplanēmenoi*' in B 8:54 means (Tarán, op. cit., p. 86) 'they have gone astray', in a sense which again (cp. Tarán, op. cit., p. 63) clearly indicates an intellectual error: 'they decided to name two forms whose unity is not necessary—in which they erred' (or 'were mistaken'). (2) '*melea*' (*poluplanktōn meleōn*) means here '*sense organs*', rather than 'limbs' or (Tarán) 'body'. Guthrie (op. cit., p. 67) says 'body, for which no collective word was yet in common use'. But (*a*) '*demas*' was in use in Homer, Xenophanes, B 14:2; B 15:5; B 23:2; '*demas*' in Parmenides B 8:55 has perhaps a different meaning; (*b*) *sōma* was in use in Hesiod and Pindar, and in the following Presocratics: Orpheus B 3 = Plato, *Cratylus* 400C; Xenophanes B 15:4 (perhaps not decisive because the 'body' is here not necessarily living); Epicharmus B 26. Moreover, (*c*) there is little doubt that for 'sense organs' no collective word was yet in common use. Here it is most interesting to find that Empedocles tries hard to find an acceptable description for sense organs in B 2:1: 'For narrow are the openings of the sense organs [*palamai*, lit. hands,

What at each time the much-erring sense organs mix themselves up with
That occurs as a thought to mankind. For these two are the same thing:
That which thinks and the mixture which makes up the sense organs' nature.
What this mixture contains becomes thought, in each man and all.

This anti-sensualist theory of knowledge prevailed in the Eleatic and Platonic schools. It was criticized, though mildly, by Empedocles[34] but (according to Plato) strongly attacked by Protagoras who, if Plato is right,[35] intended by his famous proposition 'Man is the measure of all things' to turn the tables upon Parmenides: as we are mortal men we are constrained to accept what Parmenides had contemptuously described as delusive opinion and as mere appearance.[36]

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instruments for gripping] which like soft mounds are distributed over the limbs [*guia*]; and much of poor significance is bursting upon them, dulling their attention.' (That Empedocles complains here about the 'narrow senses' is confirmed not only by B 3:9 ff., but also by Cicero, *Acad. post.* I, 12:44, where he speaks of Empedocles and '*angustos sensus*'; cp. DK, Anaxagoras, A 95.) That the '*palamai*' are sense organs comes out very clearly in B 3:9, in which they are specified as eyes, ears, the tongue, and the other *limbs* (= *guia*). Now since '*guia*' and '*melea*' (*kata melea* = limb by limb) are synonyms, we have here a strong argument for the thesis that '*melea*' in Parmenides B 16 means indeed 'sense organs' like '*guia*' in Empedocles B 3:13.

I may add that '*pleon*' in line 4 of Parmenides B 16 which I have here translated by 'contains' (for metrical reasons) should more literally be translated by 'is full of'; see Tarán, op. cit., p. 169, who seems to be right when he connects it with B 9:3.

[34] This mild criticism is contained in DK Empedocles, B 3:9 to 13. Empedocles admits (B 2) that the senses are bad, but seems to say there that by using them all for mutual corroboration, together with all other sources of knowledge, we might get somewhere. (The passage seems to allude to Parmenides B 7:4 and 5.)

[35] Cp. Plato, *Theaetetus*, 152A–B and E, and later passages.

[36] If we assume that Democritus was under the influence of both Parmenides and Protagoras, then the famous dialogue between the Intellect and the Senses DK Democritus B 125 may be described as a summing up of these two influences: the Intellect says: 'Sweet: by convention; bitter: by convention; cold: by convention; colour: by convention. In truth, there are only atoms and the void.' The Senses reply: 'Poor Intellect! You who are taking your evidence from us are trying to overthrow us? Our overthrow will be your downfall.' A later and quite Parmenidean summing up is to be found in C. Bovillus (1470–1533), *De intellectu*: 'Nothing is in the senses that was not previously in the intellect. Nothing is in

It is strange that the criticism of the authority of the senses which is one of the oldest of philosophical traditions (though it was not accepted by either Epicurus or the Stoics) has been almost ignored by modern empiricists, including phenomenalists and positivists; yet it is ignored in most of the problems posed by positivists and phenomenalists, and in the solutions they offer. The reason is this: they believe that it is not our senses that err, but that it is always 'we ourselves' who err in *our interpretation* of what is 'given' to us by our senses. Our senses tell the truth, but we may err, for example, when we try to put into *language—conventional, man-made, imperfect language*—what they tell us. It is our linguistic description which is faulty because it may be tinged with prejudice.

(So our man-made, conventional, language was at fault—almost exactly as Parmenides had said, long ago. But more recently it was discovered that our language too was 'given' to us, in an important sense: that it embodied the wisdom and experience of countless generations, and that it should not be blamed if we misused it. So language too became a truthful authority that could never deceive us. If we fall into temptation and use language in vain, then it is we who are to blame for the trouble that ensues. For Language is a jealous God Who will not hold him guiltless that taketh His words in vain, but will throw him into darkness and confusion.[37])

By blaming *us*, and our language (or misuse of Language), it is possible to uphold the divine authority of the senses (and even of Language). But it is possible only at the cost of widening the gap between this authority and ourselves: between the pure sources from which we can obtain an authoritative knowledge of the truthful goddess Nature, and our impure and guilty selves: between God and man. As indicated before, this idea of the truthfulness of Nature which, I believe, can be discerned in Bacon, derives from the Greeks; for it is part of the

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the intellect that was not previously in the senses. The first is true for angels [= the way of truth], the second for humans [= the way of delusion].' The second is, of course, a formulation to be found in St. Thomas.

[37] This paragraph alludes to the changes from the early to the late Wittgenstein.

classical opposition between *nature* and human *convention* which, according to Plato, is due to Pindar; which may be discerned in Parmenides; and which is identified by him, and by some Sophists (for example, by Hippias), and partly also by Plato himself, with the opposition between divine truth and human error, or even falsehood. After Bacon, and under his influence, the idea that nature is divine and truthful, and that all error or falsehood is due to the deceitfulness of our own human conventions, continued to play a major role not only in the history of philosophy, of science, and of politics, but also in that of the visual arts. This may be seen, for example, from Constable's most interesting theories on nature, veracity, prejudice, and convention, quoted in E. H. Gombrich's *Art and Illusion*.[38] It has also played a role in the history of literature, and even in that of music.

XII

Can the strange view that the truth of a statement may be decided upon by inquiring into its sources—that is to say its *origin*—be explained as due to some logical mistake which might be cleared up? Or can we do no better than explain it in terms of religious beliefs, or in psychological terms—referring perhaps to parental authority? I believe that it is indeed possible to discern here a logical mistake which is connected with the close analogy between the *meaning* of our words, or terms, or concepts, and the *truth* of our statements or propositions. (See the table on the next page.)

It is easy to see that the meaning of our words does have some connexion with their history or their origin. A word is, logically considered, a conventional sign; psychologically considered, it is a sign whose meaning is established by usage or custom or association. Logically considered, its meaning was indeed established by an initial decision—something like a primary definition or convention, a kind of original social contract; and psychologically considered, its meaning was

[38] See E. H. Gombrich, *Art and Illusion*, new edn. 1962, especially pp. 29 and 321 f.

established when we originally learned to use it, when we first formed our linguistic habits and associations. Thus there is a point in the complaint of the schoolboy about the unnecessary artificiality of French in which 'pain' means bread, while English, he feels, is so much more natural and straightforward in calling pain 'pain' and bread 'bread'. He may understand

IDEAS

that is

DESIGNATIONS *or* TERMS *or* CONCEPTS	STATEMENTS *or* JUDGEMENTS *or* PROPOSITIONS

may be formulated in

WORDS	ASSERTIONS

which may be

MEANINGFUL	TRUE

and their

MEANING	TRUTH

may be reduced, by way of

DEFINITIONS	DERIVATIONS

to that of

UNDEFINED CONCEPTS	PRIMITIVE PROPOSITIONS

the attempt, incidentally, to establish rather than to reduce their

MEANING	TRUTH

by these means leads to an infinite regress

the conventionality of the usage perfectly well, but he gives expression to the feeling that there is no reason why the original conventions—original for him—should not be binding. So his mistake may consist merely in forgetting that there can be several equally binding original conventions. But who has not made, implicitly, the same mistake? Most of us have caught ourselves in a feeling of surprise when we find that in France even little children speak French fluently. Of course,

we smile about our own naïvety; but we do not smile about the policeman who discovers that *the real name* of the man called 'Samuel Jones' was 'John Smith'—though here is, no doubt, a last vestige of the magical belief that we gain power over a man or a god or a spirit by gaining knowledge of his *real* name: by pronouncing it, we can summon or cite him.

Thus there is indeed a familiar as well as a logically defensible sense in which the 'true' or 'proper' meaning of a term is its original meaning; so that if we understand it, we do so because we learned it correctly—from a true authority, from one who knew the language. This shows that the problem of the meaning of a word is indeed linked to the problem of the authoritative source, or the origin, of our usage.

It is different with the problem of the truth of a statement of fact, a proposition. For anybody can make a factual mistake—even in matters on which he should be an authority, such as his own age or the colour of a thing which he has just this moment clearly and distinctly perceived. And as to origins, a statement may easily have been false when it was first made, and first properly understood. A word, on the other hand, must have had a proper meaning as soon as it was ever understood.

If we thus reflect upon the difference between the ways in which the meaning of words and the truth of statements is related to their origins, we are hardly tempted to think that the question of origin can have much bearing on the question of knowledge or of truth. There is, however, a deep analogy between meaning and truth; and there is a philosophical view —I have called it 'essentialism'—which tries to link meaning and truth so closely that the temptation to treat them in the same way becomes almost irresistible.

In order to explain this briefly, we may once more contemplate the table on the preceding page, noting the relation between its two sides.

How are the two sides of this table connected? If we look at the left side of the table, we find there the word '*Definitions*'. But a definition is a kind of *statement* or *judgement* or *proposition*,

and therefore one of those things which stand on the right side of our table. (This fact, incidentally, does not spoil the symmetry of the table, for derivations are also things that transcend the kind of things—statements, etc.—which stand on the side where the word 'derivation' occurs: just as a definition is formulated by a special kind of *sequence of words* rather than by a word, so a derivation is formulated by a special kind of *sequence of statements* rather than by a statement.) The fact that definitions, which occur on the left side of our table, are nevertheless statements suggests that somehow they may form a link between the left and the right side of the table.

That they do this is, indeed, part of that philosophic doctrine to which I have given the name 'essentialism'. According to essentialism (especially Aristotle's version of it) a definition is a statement of the inherent essence or nature of a thing. At the same time, it states the meaning of a word—of the name that designates the essence. (For example, Descartes, and also Kant, held that the word 'body' designates something that is, essentially, *extended*.)

Moreover, Aristotle and all other essentialists held that *definitions are 'principles'*; that is to say, they yield primitive propositions (example: 'All bodies are extended') which cannot be derived from other propositions, and which form the basis, or are part of the basis, of every demonstration. They thus form the basis of every science.[39] It should be noted that this particular tenet, though an important part of the essentialist creed, is free of any reference to 'essences'. This explains why it was accepted by some nominalistic opponents of essentialism such as Hobbes or, say, Schlick.[40]

I think we have now the means at our disposal by which we can explain the logic of the view that questions of origin may decide questions of factual truth. For if origins can determine the *true meaning* of a term or word, then they can determine the *true definition* of an important idea, and therefore some at least of the basic 'principles' which are descriptions of the essences

[39] See my *Open Society*, especially notes 27 to 33 to ch. 11.
[40] See M. Schlick, *Erkenntnislehre*, 2nd edn., 1925, p. 62.

or natures of things and which underlie our demonstrations and consequently our scientific knowledge. *So it will then appear that there are authoritative sources of our knowledge.*

Yet we must realize that essentialism is mistaken in suggesting that definitions can add to our *knowledge of facts* (although *qua* decisions about conventions they may be influenced by our knowledge of facts, and although they create instruments which may in their turn influence the formation of our theories and thereby the evolution of our knowledge of facts). Once we see that definitions never give any factual knowledge about 'nature', or about 'the nature of things', we also see the break in the logical link between the problem of origin and that of factual truth which some essentialist philosophers tried to forge.

XIII

I will now leave all these largely historical reflections aside, and turn to the problems themselves, and to their solution.

This part of my lecture might be described as an attack on *empiricism*, as formulated for example in the following classical statement of Hume's: 'If I ask you why you believe any particular matter of fact . . ., you must tell me some reason; and this reason will be some other fact, connected with it. But as you cannot proceed after this manner, *in infinitum*, you must at last terminate in some fact, which is present to your memory or senses; or must allow that your belief is entirely without foundation.'[41]

The problem of the validity of empiricism may be roughly put as follows: is observation the ultimate source of our knowledge of nature? And if not, what are the sources of our knowledge?

These questions remain, whatever I may have said about Bacon, and even if I should have managed to make those parts of his philosophy on which I have commented somewhat unattractive for Baconians and for other empiricists.

[41] See David Hume, *An Enquiry concerning Human Understanding*, Section v, Part I; Selby-Bigge, p. 46; see also my motto, taken from Section vii, Part I; p. 62.

The problem of the sources of our knowledge has recently been restated as follows. If we make an assertion, we must justify it; but this means that we must be able to answer the following questions.

How do you know? What are the sources of your assertion?

This, the empiricist holds, amounts in its turn to the question,

What observations (or memories of observations) *led you to your assertion?*

I find this string of questions quite unsatisfactory.[42]

First of all, most of our assertions are not based upon observations, but upon all kinds of other sources. 'I read it in *The Times*' or perhaps 'I read it in the *Encyclopaedia Britannica*' is a more likely and a more definite answer to the question 'How do you know?' than 'I have observed it' or 'I know it from an observation I made last year'.

'But', the empiricist will reply, 'how do you think that *The Times* or the *Encyclopaedia Britannica* got their information? Surely, if you only carry on your inquiry long enough, you will end up with *reports of the observations of eyewitnesses* (sometimes called "protocol sentences" or—by yourself—"basic statements"). Admittedly', the empiricist will continue, 'books are largely made from other books. Admittedly, a historian, for example, will work from documents. But ultimately, in the last analysis, these other books, or these documents, must have been based upon observations. Otherwise they would have to be described as poetry, or invention, or lies, but not as testimony. It is in this sense that we empiricists assert that observation must be the ultimate source of our knowledge.'

Here we have the empiricist's case, as it is still put by some of my positivist friends.

I shall try to show that this case is as little valid as Bacon's; that the answer to the question of the sources of knowledge goes against the empiricist; and, finally, that this whole question of ultimate sources—sources to which one may

[42] The string of questions is suggested by Carnap's formulation of what he takes to be the central problem of epistemology; cp. *Logical Foundations of Probability*, 1950, p. 189.

appeal, as one might to a higher court or a higher authority—must be rejected as based upon a mistake.

First I want to show that if you actually went on questioning *The Times* and its correspondents about the sources of their knowledge, you would in fact never arrive at all those observations by eyewitnesses in the existence of which the empiricist believes. You would find, rather, that with every single step you take, the need for further steps increases in snowball-like fashion.

Take as an example the sort of assertion for which reasonable people might simply accept as sufficient the answer 'I read it in *The Times*'; let us say the assertion, 'The Prime Minister has decided to return to London several days ahead of schedule.' Now assume for a moment that somebody doubts this assertion, or feels the need to investigate its truth. What shall he do? If he has a friend in the Prime Minister's office, the simplest and most direct way would be to ring him up; and if this friend corroborates the message, then that is that.

In other words, the investigator will, if possible, try to check, or to examine, *the asserted fact itself*, rather than trace the source of the information. But according to the empiricist theory, the assertion 'I have read it in *The Times*' is merely a first step in a justification procedure consisting in tracing the ultimate source. What is the next step?

There are at least two next steps. One would be to reflect that 'I have read it in *The Times*' is also an assertion, and that we might ask 'What is the source of your knowledge that you read it in *The Times* and not, say, in a paper looking very similar to *The Times*?' The other is to ask *The Times* for the sources of its knowledge. The answer to the first question may be 'But we have only *The Times* on order and we always get it in the morning' which gives rise to a host of further questions about sources which we shall not pursue. The second question may elicit from the editor of *The Times* the answer: 'We had a telephone call from the Prime Minister's Office.' Now according to the empiricist procedure, we should at this stage ask next: 'Who is the gentleman who received the telephone call?'

and then get his observation report; but we should also have to ask that gentleman: 'What is the source of your knowledge that the voice you heard came from an official in the Prime Minister's office?', and so on.

There is a simple reason why this tedious sequence of questions never comes to a satisfactory conclusion. It is this. Every witness must always make ample use, in his report, of his knowledge of persons, places, things, linguistic usages, social conventions, and so on. He cannot rely merely upon his eyes or ears, especially if his report is to be of use in justifying any assertion worth justifying. But this fact must of course always raise new questions as to the sources of those elements of his knowledge which are not immediately observational.

This is why the programme of tracing back all knowledge to its ultimate source in observation is logically impossible to carry through: it leads to an infinite regress. (The doctrine that truth is manifest cuts off the regress. This is interesting because it may help to explain the attractiveness of that doctrine.)

I wish to mention, in parenthesis, that this argument is closely related to another—that all observation involves interpretation in the light of our theoretical knowledge,[43] or that pure observational knowledge, unadulterated by theory, would, if at all possible, be utterly barren and futile.

The most striking thing about the observationalist programme of asking for sources—apart from its tediousness—is its stark violation of common sense. For if we are doubtful about an assertion, then the normal procedure is to test it, rather than to ask for its sources; and if we find independent corroboration, then we shall often accept the assertion without bothering at all about sources.

Of course there are cases in which the situation is different. Testing an *historical* assertion always means going back to sources; but not, as a rule, to the reports of eyewitnesses.

Clearly, no historian will accept the evidence of documents uncritically. There are problems of genuineness, there are

[43] See my *Logic of Scientific Discovery*, last paragraph of section 24, and new appendix *x, (2).

problems of bias, and there are also such problems as the reconstruction of earlier sources. There are, of course, also problems such as: was the writer present when these events happened? But this is not one of the characteristic problems of the historian. He may worry about the reliability of a report, but he will rarely worry about whether or not the writer of a document was an eyewitness of the event in question, even assuming that this event was of the nature of an observable event. A letter saying 'I changed my mind yesterday on this question' may be most valuable historical evidence, even though changes of mind are unobservable (and even though we may conjecture, in view of other evidence, that the writer was lying).

As to eyewitnesses, they are important almost exclusively in a court of law where they can be cross-examined. As most lawyers know, eyewitnesses often err. This has been experimentally investigated, with the most striking results. Witnesses most anxious to describe an event as it happened are liable to make scores of mistakes, especially if some exciting things happen in a hurry; and if an event suggests some tempting interpretation, then this interpretation, more often than not, is allowed to distort what has actually been seen.

Hume's view of historical knowledge was different: '. . . we believe', he writes in the *Treatise*,[44] 'that Caesar was kill'd in the Senate-house on the *ides of March* . . . because this fact is establish'd on the unanimous testimony of historians, who agree to assign this precise time and place to that event. Here are certain characters and letters present either to our memory or senses; which characters we likewise remember to have been us'd as the signs of certain ideas; and these ideas were either in the minds of such as were immediately present at that action, and receiv'd the ideas directly from its existence; or they were deriv'd from the testimony of others, and that again from another testimony . . . 'till we arrive at those who were eye-witnesses and spectators of the event.'[45]

[44] David Hume, *A Treatise of Human Nature*, Book I, Part III, Section iv; Selby-Bigge, p. 83.

[45] See also Hume's *Enquiry*, Section x; Selby-Bigge, pp. 111 ff.

It seems to me that this view must lead to the infinite regress described above. For the problem is, of course, whether 'the unanimous testimony of historians' is to be accepted, or whether it is, perhaps, to be rejected as the result of their reliance on a common yet spurious source. The appeal to 'letters present to our memory or our senses' cannot have any bearing on this or on any other relevant problem of historiography.

XIV

But what, then, are the sources of our knowledge?

The answer, I think, is this: there are all kinds of sources of our knowledge; but *none has authority*.

We may say that *The Times* can be a source of knowledge, or the *Encyclopaedia Britannica*. We may say that certain papers in the *Physical Review* about a problem in physics have more authority, and are more of the character of a source, than an article about the same problem in *The Times* or the *Encyclopaedia*. But it would be quite wrong to say that the source of the article in the *Physical Review* must have been wholly, or even partly, observation. The source may well be the discovery of an inconsistency in another paper, or say, the discovery of the fact that a hypothesis proposed in another paper could be tested by such and such an experiment; all these non-observational discoveries are 'sources' in the sense that they all add to our knowledge.

I do not, of course, deny that an experiment may also add to our knowledge, and in a most important manner. But it is not a source in any ultimate sense. It has always to be checked: as in the example of the news in *The Times* we do not, as a rule, question the eyewitness of an experiment, but, if we doubt the result, we may repeat the experiment, or ask somebody else to repeat it.

The fundamental mistake made by the philosophical theory of the ultimate sources of our knowledge is that it does not distinguish clearly enough between questions of origin and questions of validity. Admittedly, in the case of historio-

graphy, these two questions may sometimes coincide. The question of the validity of an historical assertion may be testable only, or mainly, in the light of the origin of certain sources. But in general the two questions are different; and in general we do not test the validity of an assertion or information by tracing its sources or its origin, but we test it, much more directly, by a critical examination of what has been asserted—of the asserted facts themselves.

Thus the empiricist's questions 'How do you know? What is the source of your assertion?' are wrongly put. They are not formulated in an inexact or slovenly manner, but *they are entirely misconceived*: they are questions that beg for an authoritarian answer.

XV

The traditional systems of epistemology may be said to result from yes-answers or no-answers to questions about the sources of our knowledge. *They never challenge these questions, or dispute their legitimacy*; the questions are taken as perfectly natural, and nobody seems to see any harm in them.

This is quite interesting, for these questions are clearly authoritarian in spirit. They can be compared with that traditional question of political theory, 'Who should rule?', which begs for an authoritarian answer such as 'the best', or 'the wisest', or 'the people', or 'the majority'. (It suggests, incidentally, such silly alternatives as 'Who should be our rulers: the capitalists or the workers?', analogous to 'What is the ultimate source of knowledge: the intellect or the senses?') This political question is wrongly put and the answers which it elicits are paradoxical.[46] It should be replaced by a completely different question such as '*How can we organize our political institutions so that bad or incompetent rulers* (whom we should try not to get, but whom we so easily might get all the same) *cannot do too much damage?*' I believe that only by changing our question in this way can we hope to proceed towards a reasonable theory of political institutions.

[46] I have tried to show this in ch. 7 of my *Open Society*.

The question about the sources of our knowledge can be replaced in a similar way. It has always been asked in the spirit of: 'What are the best sources of our knowledge—the most reliable ones, those which will not lead us into error, and those to which we can and must turn, in case of doubt, as the last court of appeal?' I propose to assume, instead, that no such ideal sources exist—no more than ideal rulers—and that *all* 'sources' are liable to lead us into error at times. And I propose to replace, therefore, the question of the sources of our knowledge by the entirely different question: '*How can we hope to detect and eliminate error?*'

The question of the sources of our knowledge, like so many authoritarian questions, is a *genetic* one. It asks for the origin of our knowledge, in the belief that knowledge may legitimize itself by its pedigree. The nobility of the racially pure knowledge, the untainted knowledge, the knowledge which derives from the highest authority, if possible from God: these are the (often unconscious) metaphysical ideas behind the question. My modified question, 'How can we hope to detect error?' may be said to derive from the view that such pure, untainted and certain sources do not exist, and that questions of origin or of purity should not be confounded with questions of validity, or of truth. This view may be said to be as old as Xenophanes. Xenophanes knew that our knowledge—the knowledge of mortals—is guesswork, opinion—*doxa* rather than *epistēmē*—as shown by his verses:[47]

In the beginning the gods did not grant us a glimpse of their secrets;
Yet, in time, if we seek we shall find, and shall learn to know better.

But as for certain truth, no man has known it,
Nor will he know it; neither of the gods,
Nor yet of all the things of which I speak.
And even if by chance he were to utter
The final truth, he would himself not know it;
For all is but a woven web of guesses.

[47] DK, Xenophanes, B 18 and 34. (Cp. also note 14, above.)

Yet the traditional question of the authoritative sources of knowledge is repeated even today—and very often by positivists and by other philosophers who believe themselves to be in revolt against authority.

The proper answer to my question 'How can we hope to detect and eliminate error?' is, I believe, 'By *criticizing* the theories or guesses of others and—if we can train ourselves to do so—by *criticizing* our own theories or guesses.' (The latter point is highly desirable, but not indispensable; for if we fail to criticize our own theories, there may be others to do it for us.) This answer sums up a position which I propose to call 'critical rationalism'. It is a view, an attitude, and a tradition, which we owe to the Greeks. It is very different from the 'rationalism' or 'intellectualism' of Descartes and his school, and very different even from the epistemology of Kant. Yet in the field of ethics, of moral knowledge, it was approached by Kant with his *principle of autonomy*. This principle expresses his realization that we must not accept the command of an authority, however exalted, as the basis of ethics. For whenever we are faced with a command by an authority, it is for us to judge, critically, whether it is moral or immoral to obey. The authority may have power to enforce its commands, and we may be powerless to resist. But if we have the physical power of choice, then the ultimate responsibility remains with us. It is our own critical decision whether to obey a command; whether to submit to an authority.

Kant boldly carried this idea into the field of religion: '. . . in whatever way', he writes, 'the Deity should be made known to you, and even . . . if He should reveal Himself to you: it is you . . . who must judge whether you are permitted to believe in Him, and to worship Him.'[48]

In view of this bold statement, it seems strange that in his philosophy of science Kant did not adopt the same attitude of critical rationalism, of the critical search for error. I feel certain that it was only his acceptance of the authority of Newton's

[48] See Immanuel Kant, *Religion Within the Limits of Pure Reason*, 2nd edition, 1794, Fourth Chapter, Part II, § 1, the first footnote (added in the 2nd edition).

cosmology—a result of its almost unbelievable success in passing the most severe tests—which prevented Kant from doing so. If this interpretation of Kant is correct, then the critical rationalism (and also the critical empiricism) which I advocate merely puts the finishing touch to Kant's own critical philosophy. And this was made possible by Einstein, who taught us that Newton's theory may well be mistaken in spite of its overwhelming success.

So my answer to the questions 'How do you know? What is the source or the basis of your assertion? What observations have led you to it?' would be: 'I do *not* know: my assertion was merely a guess. Never mind the source, or the sources, from which it may spring—there are many possible sources, and I may not be aware of half of them; and origins or pedigrees have in any case little bearing upon truth. But if you are interested in the problem which I tried to solve by my tentative assertion, you may help me by criticizing it as severely as you can; and if you can design some experimental test which you think might refute my assertion, I shall gladly, and to the best of my powers, help you to refute it.'

This answer[49] applies, strictly speaking, only if the question is asked about some scientific assertion as distinct from an historical one. If my conjecture was an historical one, sources (in the non-ultimate sense) will of course come into the critical discussion of its validity. Yet fundamentally, my answer will be the same, as we have seen.

XVI

It is high time now, I think, to formulate the epistemological results of this discussion. I will put them in the form of ten theses.

(1) There are no ultimate sources of knowledge. Every source, every suggestion, is welcome; and every source, every suggestion, is open to critical examination. Except in history

[49] This answer, and almost the whole of the contents of the present section XV, are taken with only minor changes from a paper of mine which was first published in *The Indian Journal of Philosophy*, 1, No. 1, 1959.

we usually examine the facts themselves rather than the sources of our information.

(2) The proper epistemological question is not one about sources; rather, we ask whether the assertion made is true—that is to say, whether it agrees with the facts. (That we may operate, without getting involved in antinomies, with the idea of objective truth in the sense of correspondence to the facts, has been shown by the work of Alfred Tarski.[50]) And we try to find this out, as well as we can, by examining or testing the assertion itself; either in a direct way, or by examining or testing its consequences.

(3) In connexion with this examination, all kinds of arguments may be relevant. A typical procedure is to examine whether our theories are consistent with our observations. But we may also examine, for example, whether our historical sources are mutually and internally consistent.

(4) Quantitatively and qualitatively by far the most important source of our knowledge—apart from inborn knowledge—is tradition. Most things we know we have learned by example, by being told, by reading books, by learning how to criticize, how to take and to accept criticism, how to respect truth.

(5) The fact that most of the sources of our knowledge are traditional condemns anti-traditionalism as futile. But this fact must not be held to support a traditionalist attitude: every bit of our traditional knowledge (and even our inborn knowledge) is open to critical examination and may be overthrown. Nevertheless, without tradition, knowledge would be impossible.

(6) Knowledge cannot start from nothing—from a *tabula rasa*—nor yet from observation. The advance of knowledge consists, mainly, in the modification of earlier knowledge. Although we may sometimes, for example in archaeology, advance through a chance observation, the significance of the discovery will usually depend upon its power to modify our earlier theories.

[50] See A. Tarski, *Logic, Semantics, Metamathematics*, 1956, ch. viii; also 'The Semantic Conception of Truth', in *Philosophy and Phenomenological Research*, 4, 1944, pp. 341–76.

(7) Pessimistic and optimistic epistemologies are about equally mistaken. The pessimistic cave story of Plato is the true one, and not his optimistic story of *anamnēsis* (even though we should admit that all men, like all other animals, and even all plants, possess inborn knowledge). But although the world of appearances is indeed a world of mere shadows on the walls of our cave, we all constantly reach out beyond it; and although, as Democritus said, the truth is hidden in the deep, we can probe into the deep. There is no criterion of truth at our disposal, and this fact supports pessimism. But we do possess criteria which, *if we are lucky*, may allow us to recognize error and falsity. Clarity and distinctness are not criteria of truth, but such things as obscurity or confusion *may* indicate error. Similarly coherence cannot establish truth, but incoherence and inconsistency do establish falsehood. And, when they are recognized, our own errors provide the dim red lights which help us in groping our way out of the darkness of our cave.

(8) Neither observation nor reason is an authority. Intellectual intuition and imagination are most important, but they are not reliable: they may show us things very clearly, and yet they may mislead us. They are indispensable as the main sources of our theories; but most of our theories are false anyway. The most important function of observation and reasoning, and even of intuition and imagination, is to help us in the critical examination of those bold conjectures which are the means by which we probe into the unknown.

(9) Never quarrel about words. Philosophical problems should not and need not be verbal problems. Verbal problems are unimportant and should always be avoided, though unfortunately they are rarely avoided by philosophers.

(10) Every solution of a problem raises new unsolved problems; the more so the deeper the original problem and the bolder its solution. The more we learn about the world, and the deeper our learning, the more conscious, specific, and articulate will be our knowledge of what we do not know, our knowledge of our ignorance. For this, indeed, is the main

source of our ignorance—the fact that our knowledge can be only finite, while our ignorance must necessarily be infinite.

We may get a glimpse of the vastness of our ignorance when we contemplate the vastness of the heavens: though the mere size of the universe is not the deepest cause of our ignorance, it is one of its causes. 'Where I seem to differ from some of my friends', F. P. Ramsey wrote in a charming passage of his *Foundations of Mathematics*,[51] 'is in attaching little importance to physical size. I don't feel in the least humble before the vastness of the heavens. The stars may be large but they cannot think or love; and these are qualities which impress me far more than size does. I take no credit for weighing nearly seventeen stone.' I suspect that Ramsey's friends would have agreed with him about the insignificance of sheer physical size; and I suspect that if they felt humble before the vastness of the heavens, this was because they saw in it a symbol of their ignorance.

I believe that it would be worth trying to learn something about the world even if in trying to do so we should merely learn that we do not know much. This state of learned ignorance might be a help in many of our troubles. It might be well for all of us to remember that, while differing widely in the various little bits we know, in our infinite ignorance we are all equal.

XVII

There is a last question I wish to raise.

If only we look for it we can often find a true idea, worthy of being preserved, in a philosophical theory which must be rejected as false. Can we find an idea like this in one of the theories of the ultimate sources of our knowledge?

I believe we can; and I suggest that it is one of the two main ideas which underlie the doctrine that the source of all our knowledge is super-natural. The first of these ideas is false, I believe, while the second is true.

The first, the false idea, is that we must *justify* our knowledge, or our theories, by *positive* reasons, that is, by reasons

[51] F. P. Ramsey, *The Foundations of Mathematics*, 1931, p. 291.

capable of establishing them, or at least of making them highly probable; at any rate, by better reasons than that they have so far withstood criticism. This idea implies, I suggested, that we must appeal to some ultimate or authoritative source of true knowledge; which still leaves open the character of that authority—whether it is human, like observation or reason, or super-human (and therefore super-natural).

The second idea—whose vital importance has been stressed by Russell—is that no man's authority can establish truth by decree; that we should submit to truth; that *truth is above human authority*.

Taken together these two ideas almost immediately yield the conclusion that the sources from which our knowledge derives must be super-human; a conclusion which tends to encourage self-righteousness and the use of force against those who refuse to see the divine truth.

Some who rightly reject this conclusion do not, unhappily, reject the first idea—the belief in the existence of ultimate sources of knowledge. Instead they reject the second idea—the thesis that truth is above human authority. They thereby endanger the idea of the objectivity of knowledge, and of common standards of criticism or rationality.

What we should do, I suggest, is to give up the idea of ultimate sources of knowledge, and admit that all knowledge is human; that it is mixed with our errors, our prejudices, our dreams, and our hopes; that all we can do is to grope for truth even though it be beyond our reach. We may admit that our groping is often inspired, but we must be on our guard against the belief, however deeply felt, that our inspiration carries any authority, divine or otherwise. If we thus admit that there is no authority beyond the reach of criticism to be found within the whole province of our knowledge, however far it may have penetrated into the unknown, then we can retain, without danger, the idea that truth is beyond human authority. And we must retain it. For without this idea there can be no objective standards of inquiry; no criticism of our conjectures; no groping for the unknown; no quest for knowledge.