

Karl R. Popper

On the Sources of Knowledge and of Ignorance

*It follows, therefore, that truth manifests
itself...*

BENEDICTUS DE SPINOZA

*...it is impossible for us to think of any
thing, which we have not antecedently
felt, either by our external or internal
senses.*

DAVID HUME

MY TITLE is likely, I fear, to offend some critical eyes. For although "Sources of Knowledge" is in order, and "Sources of Error" would have been in order too, the phrase "Sources of Ignorance" is another matter. "Ignorance is something negative: it is the absence of knowledge. But how on earth can the absence of anything have sources?"¹ This question was put to me by a friend when I confided to him the title I had chosen; I was a little shaken by this for I had been, I confess, quite pleased. Hard pressed for a reply I found myself improvising a rationalisation, and explaining that the curious linguistic effect of the title was actually intended. I told him that I hoped to direct attention, through the phrasing of this title, to a number of historically important although unrecorded philosophical doctrines and among them, especially, to a *conspiracy theory of ignorance* which interprets ignorance not as a mere lack of knowledge but as the work of some mischievous power, the source of impure and evil influences which pervert and poison our minds and instil in us the habit of resistance to knowledge.

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The problem which I wish to examine afresh, and which I hope not only to examine but to solve, may perhaps be described as an aspect of the old quarrel between the British and the Continental schools of philosophy—the quarrel between the classical empiricism of Bacon, Locke, Berkeley, Hume, and Mill, and the classical rationalism or intellectualism of Descartes, Spinoza, and Leibniz. In this quarrel, the British school insisted that the ultimate source of all knowledge was observation, while the Continental school insisted that it was the intellectual intuition of clear and distinct ideas.

Most of these issues are still very much alive. Not only has empiricism, still the ruling doctrine in England, conquered the United States, but it is now widely accepted even on the European Continent as the true theory of *scientific* knowledge. Cartesian intellectualism, alas, has been only too often distorted into one or another of the various forms of modern irrationalism.

I shall try to show that the differences between classical empiricism and rationalism are much smaller than their similarities, and that both are mistaken. I hold that they are mistaken although I am myself both an empiricist and a rationalist of sorts. But I believe that, though observation and reason have each an important role to play, these roles hardly resemble those which their classical defenders attributed to

¹ Descartes and Spinoza went even further, and asserted that not only ignorance but also error is "something negative"—a "privation" of knowledge, and even of the proper use of our freedom. Nevertheless, they speak also of the "cause" of falsity (or error).

them. More especially, I shall try to show that neither observation nor reason can be described as a source of knowledge, in the sense in which they have been claimed to be sources of knowledge, down to the present day.

OUR PROBLEM BELONGS to the theory of knowledge, or to epistemology, reputed to be the most abstract and remote and altogether irrelevant region of pure philosophy. Hume, for example, one of the greatest thinkers in the field, predicted that, because of the remoteness and abstractness and practical irrelevance of some of his results, none of his readers would believe in them for more than an hour.

Kant's attitude was different. He thought that the problem "What can I know?" was one of the three most important questions a man could ask. Bertrand Russell, in spite of being closer to Hume in philosophic temperament, seems to side in this matter with Kant. And I believe that Russell is right when he attributes to epistemology practical consequences for science, for ethics, and even for politics. He points out, for example, that epistemological relativism, or the idea that there is no such thing as objective truth, and epistemological pragmatism, or the idea that truth is the same as usefulness, are closely linked with authoritarian and totalitarian ideas.

Russell's views are of course disputed. Some recent philosophers have developed a doctrine of the essential impotence and practical irrelevance of all genuine philosophy, and thus, one can assume, of epistemology. Philosophy, they say, cannot by its very nature have any significant consequences, and so it can influence neither science nor politics. But I think that ideas are dangerous and powerful things, and that even philosophers have sometimes produced ideas. Indeed, I have no doubt that this new doctrine of the impotence of all philosophy is amply refuted by the facts.

The situation is really very simple. The belief of a liberal—the belief in the possibility of a rule of law, of equal justice, of fundamental rights, and a free society—can easily survive the recognition that judges are not omniscient and may make mistakes about facts and that, in practice, absolute justice is hardly ever realised in any particular legal case. But this belief in the possibility of a rule of law, of justice, and of freedom, can hardly survive the acceptance of an epistemology which teaches that there are no objective facts; not merely in this particular case,

but in any other case; and that the judge cannot have made a factual mistake because he can no more be wrong about the facts than he can be right.

THE GREAT MOVEMENT of liberation which started in the Renaissance and led through the many vicissitudes of the reformation and the religious and revolutionary wars to the free societies in which the English-speaking peoples are privileged to live, this movement was inspired throughout by an unparalleled epistemological optimism: by a most optimistic view of man's power to discern truth and to acquire knowledge.

At the heart of this new optimistic view of the possibility of knowledge lies the doctrine that *truth is manifest*. Truth may perhaps be veiled. But it may reveal itself. And if it does not reveal itself, it may be revealed by us. Removing the veil may not be easy. But once the naked truth stands revealed before our eyes, we have the power to see it, to distinguish it from falsehood, and to know that it *is* truth.

The birth of modern science and modern technology was inspired by this optimistic epistemology whose main spokesmen were Bacon and Descartes. They taught that there was no need for any man to appeal to authority in matters of truth because each man carried the sources of knowledge in himself; either in his power of sense-perception which he may use for the careful observation of nature, or in his power of intellectual intuition which he may use to distinguish truth from falsehood by refusing to accept any idea which is not clearly and distinctly perceived by the intellect.

Man can know: thus he can be free. This is the formula which explains the link between epistemological optimism and the ideas of liberalism.

This link is paralleled by the opposite link. Disbelief in the power of human reason, in man's power to discern the truth, is almost invariably linked with distrust of man. Thus epistemological pessimism is linked, historically, with a doctrine of human depravity, and it tends to lead to the demand for the establishment of powerful traditions and the entrenchment of a powerful authority which would save man from his folly and his wickedness. (There is a striking sketch of this theory of authoritarianism, and a picture of the burden carried by those in authority, in the story of *The Grand Inquisitor* in Dostoevsky's *Brothers Karamazov*.)

The contrast between epistemological pessimism and optimism may be said to be fundamentally the same as that between epistemological traditionalism and rationalism. (I am using the latter term in its wider sense in which it is opposed to irrationalism, and in which it covers not only Cartesian intellectualism but empiricism also.) For we can interpret traditionalism as the belief that, in the absence of an objective and discernible truth, we are faced with the choice between accepting the authority of tradition, and chaos; while rationalism has, of course, always claimed the right of reason and of empirical science to criticise, and to reject, any tradition, and any authority, as being based on sheer unreason or prejudice or accident.

IT IS A DISTURBING FACT that even an abstract study like pure epistemology is not as pure as one might think (and as Aristotle believed) but that its ideas may, to a large extent, be motivated and unconsciously inspired by political hopes and by Utopian dreams. This should be a warning to the epistemologist. What can he do about it? As an epistemologist I have only one interest—to find out the truth about the problems of epistemology, whether or not this truth fits in with my political ideas. But am I not liable to be influenced, unconsciously, by my political hopes and beliefs?

It so happens that I am not only an empiricist and a rationalist of sorts but also a liberal; but just because I am a liberal, I feel that few things are more important for a liberal than to submit the various theories of liberalism to the most searching and critical examination.

While I was engaged in a critical examination of this kind I discovered the part played by certain epistemological theories in the development of liberal ideas; and especially by the various forms of epistemological optimism. And I found that, as an epistemologist, I had to reject these epistemological theories as untenable. This experience of mine may illustrate the point that our dreams and our hopes need not necessarily control our results, and that, in searching for the truth, it may be our best plan to start by criticising our most cherished beliefs. This may seem to some a perverse plan. But it will not seem so to those who want to find the truth and are not afraid of it.

IN EXAMINING THE optimistic epistemology inherent in certain ideas of liberalism, I found a

cluster of doctrines which, although often accepted implicitly, have not, to my knowledge, been explicitly discussed or even noticed by philosophers or historians. The most fundamental of them is one which I have already mentioned—the doctrine that truth is manifest. The strangest of them is the conspiracy theory of ignorance, which is a curious outgrowth from the doctrine of manifest truth.

By the doctrine that truth is manifest I mean the optimistic view that truth, if put before us naked, is always recognisable as truth. Thus truth, if it does not reveal itself, has only to be unveiled, or dis-covered. Once this is done, there is no need for further argument. We have been given eyes to see the truth, and the “natural light” of reason to see it by.

This doctrine is at the heart of the teaching of both Descartes and Bacon. Descartes based his optimistic epistemology on the important theory of the *veracitas dei*. What we clearly and distinctly see to be true must indeed be true; for otherwise God would be deceiving us. Thus the truthfulness of God must make truth manifest.

In Bacon we have a similar doctrine. It might be described as the doctrine of the *veracitas naturae*, the truthfulness of Nature. Nature is an open book. He who reads it with a pure mind cannot misread it. Only if his mind is poisoned by prejudice can he fall into error.

This last remark shows that the doctrine that truth is manifest creates the need to explain falsehood. Knowledge, the possession of truth, need not be explained. But how can we ever fall into error if truth is manifest? The answer is: through our own sinful refusal to see the manifest truth; or because our minds harbour prejudices inculcated by education and tradition, or other evil influences which have perverted our originally pure and innocent minds. Ignorance may be the work of powers conspiring to keep us in ignorance, to poison our minds by filling them with falsehood, and to blind our eyes so that they cannot see the manifest truth. Such prejudices and such powers, then, are sources of ignorance.

The conspiracy theory of ignorance is fairly well known in its Marxian form as the conspiracy of a capitalist press that perverts and suppresses truth and fills the workers' minds with false ideologies. Prominent among these, of course, are the doctrines of religion. It is surprising to find how unoriginal this Marxist theory is. The wicked and fraudulent priest who

keeps the people in ignorance was a stock figure of the 18th century and, I am afraid, one of the inspirations of liberalism. It can be traced back to the protestant belief in the conspiracy of the Roman Church, and also to the beliefs of those dissenters who held similar views about the Established Church.

This curious belief in a conspiracy is the almost inevitable consequence of the optimistic belief that truth, and therefore goodness, must prevail if only truth is given a fair chance.

"Let her and falsehood grapple; who ever knew Truth put to the worse, in a free and open encounter?" (*Areopagitica*).

So when Milton's Truth was put to the worse, the necessary inference was that the encounter had not been free and open: if the manifest truth does not prevail, it must have been maliciously suppressed. One can see that an attitude of tolerance which is based upon an optimistic faith in the victory of truth may easily be shaken. For it is liable to turn into a conspiracy theory which would be hard to reconcile with an attitude of tolerance.

I do not assert that there was never a grain of truth in this conspiracy theory. But in the main it was a myth, just as the theory of manifest truth from which it grew was a myth.

For the simple truth is that truth is often hard to come by, and that once found it may easily be lost again. Erroneous beliefs may have an astonishing power to survive, for thousands of years, in defiance of experience, and without the aid of any conspiracy. The history of science, and especially of medicine, could furnish us with a number of good examples. One example is, indeed, the general conspiracy theory itself. I mean the erroneous view that whenever something evil happens it must be due to the evil will of an evil power. Various forms of this view have survived down to our own day.

Thus the optimistic epistemology of Bacon and of Descartes cannot be true. Yet perhaps the strangest thing in this story is that this false epistemology was the major inspiration of an intellectual and moral revolution without parallel in history. It encouraged men to think for themselves. It gave them hope that through knowledge they might free themselves and others from servitude and misery. It made modern science possible. It became the basis of the fight against censorship and the suppression of free thought. It became the basis of the non-conformist conscience, of individualism, and of

a new sense of man's dignity; of a demand for universal education, and of a new dream of a free society. It made men feel responsible for themselves and for others, and eager to improve not only their own condition but also that of their fellow men. It is a case of a bad idea inspiring many good ones.

THIS FALSE EPISTEMOLOGY, however, has also led to disastrous consequences. The theory that truth is manifest—that it is there for everyone to see, if only he wants to see it—this theory is the basis of almost every kind of fanaticism. For only the most depraved wickedness can refuse to see the manifest truth; only those who have every reason to fear truth can deny it, and conspire to suppress it.

Yet the theory that truth is manifest not only breeds fanatics—men possessed by the conviction that all those who do not see the manifest truth must be possessed by the devil—but it may also lead, though perhaps less directly than does a pessimistic epistemology, to authoritarianism. This is so, simply, because truth is not manifest, as a rule. The allegedly manifest truth is therefore in constant need, not only of interpretation and affirmation, but also of re-interpretation and re-affirmation. An authority is required to pronounce upon, and lay down, almost from day to day, what is to be the manifest truth, and it may learn to do so arbitrarily and cynically. So many disappointed epistemologists will turn away from their own former optimism and erect a resplendent authoritarian theory on the basis of a pessimistic epistemology. It seems to me that the greatest epistemologist of all, Plato, exemplifies this tragic development.

PLATO PLAYS A DECISIVE part in the pre-history of Descartes' doctrine of the *veracitas dei*—the doctrine that our intellectual intuition does not deceive us because God is truthful and will not deceive us; or in other words, the doctrine that our intellect is a source of knowledge because God is a source of knowledge. This doctrine has a long history which can easily be traced back at least to Homer and Hesiod.

To us, the habit of referring to one's sources would seem natural in a scholar or an historian, and it is perhaps a little surprising to find that this habit stems from the poets; but it does. The Greek poets refer to the sources of their knowledge. The sources are divine. They are the

Muses. "...the Greek bards," Gilbert Murray observes in *The Rise of the Greek Epic*,

always owe, not only what we should call their inspiration, but their actual knowledge of facts to the Muses. The Muses "are present and know all things" ... Hesiod always explains that he is dependent on the Muses for his knowledge. Other sources of knowledge are indeed recognised. ... But most often he consults the Muses. ... So does Homer for such subjects as the Catalogue of the Greek army.

As this shows, the poets were in the habit of claiming not only divine sources of inspiration, but also divine sources of knowledge—divine guarantors of the truth of their stories.

Precisely the same two claims were raised by the philosophers Heraclitus and Parmenides. Heraclitus, it seems, sees himself as a prophet who "talks with raving mouth, ... possessed by the god"—by Zeus, the source of all wisdom. And Parmenides, one could almost say, forms the missing link between Homer or Hesiod on the one side and Descartes on the other. His guiding star and inspiration is the goddess Dike, described by Heraclitus as the guardian of truth. Parmenides describes her as the guardian and keeper of the keys of truth, and as the source of all his knowledge. But Parmenides and Descartes have more in common than the doctrine of divine veracity. For example, Parmenides is told by his divine guarantor of truth that in order to distinguish between truth and falsehood, he must rely upon the intellect alone, to the exclusion of the senses of sight, hearing, and taste. And even the principle of his physical theory which, like Descartes, he founds upon his intellectualist theory of knowledge, is the same as that adopted by Descartes: it is the impossibility of a void, the necessary fullness of the world.

In Plato's *Ion* a sharp distinction is made between divine inspiration—the divine frenzy of the poet—and the divine sources or origins of true knowledge. (The topic is further developed in the *Phaedrus*; and in 275b-c Plato even insists on the distinction between questions of origin and of truth.) Plato grants the inspiration to the poets but denies to them any divine authority for their alleged knowledge of facts. Nevertheless, the doctrine of the divine source of our knowledge plays a decisive part in Plato's famous theory of *anamnesis* which in some measure grants to each man the possession of divine sources of knowledge. (The knowledge considered in this theory is knowledge of the *essence or nature* of a thing rather than of a

particular historical fact.) According to Plato's *Meno* there is nothing which our immortal soul does not know, prior to our birth. For as all natures are kindred and akin, our soul must be akin to all natures. Accordingly it knows them all: it knows all things. In being born we forget; but we may recover our memory and our knowledge, though only partially: if only we see the truth again, we must recognise it. All knowledge is therefore re-cognition—re-calling or remembering the essence or true nature that we once knew.

This theory implies that our soul is in a divine state of omniscience as long as it dwells, and participates, in a divine world of ideas or essences or natures, prior to being born. The birth of a man is his fall from grace; it is his fall from a natural or divine state of knowledge; and it is thus the origin and cause of his ignorance. (Here may be the seed of the idea that ignorance is sin.)

IT IS CLEAR THAT there is a close link between this theory of *anamnesis* and the doctrine of the divine origin or source of our knowledge. At the same time, there is also a close link between the theory of *anamnesis* and the doctrine of manifest truth: if, even in our depraved state of forgetfulness, we see the truth, we cannot but recognise it as the truth. So, as the result of *anamnesis*, truth is restored to the status of that which is not forgotten and not concealed (*alēthēs*): it is that which is manifest.

Socrates demonstrates this in a beautiful passage of the *Meno* by helping an uneducated young slave to "recall" the proof of a special case of the theorem of Pythagoras. Here indeed is an optimistic epistemology, and the root of Cartesianism. It seems that, in the *Meno*, Plato was conscious of the highly optimistic character of his theory, for he describes it as a doctrine which makes men eager to learn, to search, and to discover.

Yet disappointment must have come to Plato; for in the *Republic* (and also in the *Phaedrus*) we find the beginnings of a pessimistic epistemology. In the famous story of the prisoners in the cave he shows that the world of our experience is only a shadow, a reflection, of the real world. And he shows that even if one of the prisoners should escape from the cave and face the real world, he would have almost insuperable difficulties in seeing and understanding it—to say nothing of his difficulties in trying to make those understand who

stayed behind. The difficulties in the way of an understanding of the real world are almost super-human, and only the very few, if anybody at all, can attain to the divine state of understanding the real world—the divine state of true knowledge, of *epistēmē*.

This is a pessimistic theory with regard to almost all men, though not with regard to all. (For it teaches that truth may be attained by a few—the elect. With regard to these it is, one might say, more wildly optimistic than even the doctrine that truth is manifest.) The authoritarian and traditionalist consequences of this pessimistic theory are fully elaborated in the *Laws*.

Thus we find in Plato the first development from an optimistic to a pessimistic epistemology. Each of them forms the basis of one of the two diametrically opposed philosophies of the state and of society: on the one hand an anti-traditionalist, anti-authoritarian, revolutionary and Utopian rationalism of the Cartesian kind, and on the other hand an authoritarian traditionalism.

This development is likely to be connected with the fact that the idea of an epistemological fall of man can be interpreted not only in the sense of the optimistic doctrine of *anamnesis*, but also in a pessimistic sense.

In this latter interpretation, the fall of man condemns all mortals—or almost all—to ignorance. I think one can discern in the story of the cave (and perhaps also in the story of the fall of the city, when the Muses and their divine teaching are neglected) an echo of an interesting older form of this idea. I have in mind Parmenides' doctrine that the opinions of mortals are delusions, and the result of a misguided choice—a misguided convention. (This may stem from Xenophanes' doctrine that all human knowledge is guesswork, and that his own theories are, at best, merely *similar to the truth*.) The idea of an epistemological fall of man can perhaps be found in those words of the goddess that mark the transition from the way of truth to the way of delusive opinion.

But you also shall learn how it was that delusive opinion,

Forcing its way through all things, was destined to pass for the real...

Now of this world thus arranged to seem wholly like truth I shall tell you

Then you will be nevermore overawed by the notions of mortals.

Thus though the fall affects all men, the truth may be revealed to the elect by an act of grace

—even the truth about the unreal world of the delusions and opinions, the conventional notions and decisions, of mortals; the unreal world of appearance that was destined to be accepted and approved of, as real.

The revelation received by Parmenides, and his conviction that a few may reach certainty about both, the unchanging world of eternal reality and the unreal and changing world of verisimilitude and deception, were some of the main inspirations of Plato's philosophy. It was a theme to which he was for ever returning, oscillating between hope, despair, and resignation.

YET WHAT INTERESTS us here is Plato's epistemology, the theory of *anamnesis* in the *Meno*. It contains, I believe, not only the germs of Descartes' intellectualism, but also the germs of Aristotle's and especially of Bacon's theories of induction.

For *Meno's* slave is helped by Socrates' judicious questions to remember or recapture the forgotten knowledge which his soul possessed in its ante-natal state of omniscience. It is, I believe, this famous Socratic method, called in the *Theaetetus* the art of midwifery or *maieutic*, to which Aristotle alluded when he said that Socrates was the inventor of the method of induction.

Aristotle, and also Bacon, I wish to suggest, meant by "induction" not so much the inferring of universal laws from particular observed instances as a method by which we are guided to the point whence we can intuit or perceive the essence or the true nature of a thing. But this, as we have seen, is precisely the aim of Socrates' *maieutic*: its aim is to help or lead us to *anamnesis*; and *anamnesis* is the power of seeing the true nature or essence of a thing, the nature or essence with which we were acquainted before birth, before our fall from grace. Thus the aims of the two, *maieutic* and induction, are the same. (Incidentally, Aristotle taught that the result of an induction—the intuition of the essence—was to be expressed by a definition of that essence.)

Now let us look more closely at the two procedures. The *maieutic* art of Socrates consists, essentially, in asking questions designed to destroy prejudices; false beliefs which are often traditional or fashionable beliefs; false answers, given in the spirit of ignorant cocksureness. Socrates himself does not pretend to know. His attitude is described by Aristotle in the words,

"Socrates raised questions but gave no answers; for he confessed that he did not know." Thus Socrates' *maieutic* is not an art that aims at teaching any belief, but one that aims at purging or cleansing the soul of its false beliefs, its seeming knowledge, its prejudices. It achieves this by teaching us to doubt our own convictions.

Fundamentally the same procedure is part of Bacon's induction.

THE FRAMEWORK OF BACON's theory of induction is this. He distinguishes in the *Novum Organum* between a true method and a false method. His name for the true method, "*interpretatio naturae*," is ordinarily translated by the phrase "interpretation of nature," and his name for the false method, "*anticipatio mentis*," by "anticipation of the mind." Obvious as these translations may seem, they are not adequate. What Bacon means by "*interpretatio naturae*" is, I suggest, the reading of, or better still, the *spelling out of the book of Nature*. (Galileo, in a famous passage of his *Il sagggiatore*, speaks of "that great book which lies before our eyes—I mean the universe.")

The term "interpretation" has in modern English a decidedly subjectivistic or relativistic tinge. When we speak of Rudolf Serkin's interpretation of the the *Emperor Concerto*, we imply that there are different interpretations, but that this one is Serkin's. We do not of course wish to imply that Serkin's is not the best, the truest, the nearest to Beethoven's intentions. But although we may be unable to imagine that there is a better one, by using the term "interpretation" we imply that there are other interpretations or readings, leaving the question open whether some of these other readings may, or may not, be equally true.

I have here used the word "reading" as a synonym for "interpretation," not only because the two meanings are so similar but also because "reading" and "to read" have suffered a modification analogous to that of "interpretation" and "to interpret"; except that in the case of "reading" both meanings are still in full use. In the phrase "I have read John's letter," we have the ordinary non-subjectivist meaning. But "I am reading this passage of John's letter differently" or perhaps "My reading of this passage is very different" may illustrate a later, a subjectivistic or relativistic, meaning of the word "reading."

I assert that the meaning of "interpret"

(though not in the sense of "translate") has changed in exactly the same way, except that the original meaning—perhaps "reading aloud for those who cannot read themselves"—has been practically lost. To-day even the phrase "the judge must interpret the law" means that he has a certain latitude in interpreting it; while in Bacon's time it would have meant that the judge had the duty to read the law as it stood, and to expound it and to apply it in the one and only right way. *Interpretatio juris* (or *legis*) means either this or, alternatively, the expounding of the law to the layman. It leaves the legal interpreter no latitude; at any rate no more than would be allowed to, say, a sworn interpreter translating a French legal document.

THUS THE TRANSLATION "the interpretation of nature" is misleading; it should be replaced by something like "the (true) reading of nature"; analogous to "the (true) reading of the law." And I suggest that "reading the book of Nature as it is" or better still "spelling out the book of Nature" is what Bacon meant. The point is that the phrase should suggest the avoidance of all interpretation in the modern sense, and that it should *not* contain, more especially, any suggestion of an attempt to interpret what is manifest in nature in the light of non-manifest causes or of hypotheses; for all this would be an *anticipatio mentis*, in Bacon's sense. (It is a mistake, I think, to ascribe to Bacon the teaching that hypotheses—or conjectures—may result from his method of induction; for Baconian induction results in certain knowledge rather than in conjecture.)

As to the meaning of "*anticipatio mentis*" we have only to quote Locke: "men give themselves up to the first anticipations of their minds." This is, practically, a translation from Bacon; and it makes it amply clear that "*anticipatio*" means "prejudice" or even "superstition." This is also clear from the phrase "*anticipatio deorum*" which means harbouring naïve or primitive or superstitious views about the gods. But to make matters still more obvious: "prejudice," of course, also derives from a legal term, and according to the *Oxford English Dictionary* it was Bacon who introduced the verb "to pre-judge" into the English language, in the sense of "to judge adversely in advance"—that is, in violation of the judge's duty.

Thus the two methods are (1) "the spelling out of the open book of Nature," leading to

knowledge or *epistēmē*, and (2) "the prejudice of the mind that wrongly prejudices, and perhaps misjudges, Nature," leading to *doxa*, or mere guesswork, and to the misreading of the book of Nature. This latter method, rejected by Bacon, is in fact a method of interpretation, in the modern sense of the word. It is the *method of conjecture or hypothesis* (a method of which, incidentally, I happen to be a confirmed advocate).

How can we prepare ourselves to read the book of Nature properly or truly? Bacon's answer is: by purging our minds of all anticipations or conjectures or guesses or prejudices. There are various things to be done in order so to purge our minds. We have to get rid of all sorts of idols, or generally held false beliefs; for these distort our observations. But we have also, like Socrates, to look out for all sorts of counter-instances by which to destroy our prejudices concerning the kind of thing whose true essence or nature we wish to ascertain. Like Socrates, we must, by purifying our intellects, prepare our souls to face the eternal light of essences or natures (*cf.* St. Augustine, *Civ. Dei*): our impure prejudices must be exorcised by the invocation of counter-instances.

Only after our souls have been cleansed in this way may we begin the work of spelling out diligently the open book of Nature, the manifest truth.

IN VIEW OF ALL THIS I suggest that Baconian (and also Aristotelian) induction is the same, fundamentally, as Socratic *maieutic*; that is to say, the preparation of the mind by cleansing it of prejudices, in order to enable it recognise the manifest truth, or to read the open book of Nature.

Descartes' method of systematic doubt is also fundamentally the same: it is a method of destroying all false prejudices of the mind, in order to arrive at the unshakeable basis of self-evident truth.

We can now see more clearly how, in this optimistic epistemology, the state of knowledge is the natural or the pure state of man, the state of the innocent eye which can see the truth, while the state of ignorance has its source in the injury suffered by the innocent eye in man's fall from grace; an injury which can be partially healed by a course of purification. And we can see more clearly why this epistemology, not only in Descartes' but also in Bacon's form, remains

essentially a religious doctrine in which the source of all knowledge is divine authority.

One might say that, encouraged by the divine "essences" or divine "natures" of Plato, and by the traditional Greek opposition between the truthfulness of nature and the deceitfulness of man-made convention, Bacon substitutes, in his epistemology, "Nature" for "God." This may be the reason why we have to purify ourselves before we may approach the goddess *Natura*: when we have purified our minds, even our sometimes unreliable senses (held by Plato to be hopelessly impure) will be pure. The sources of knowledge must be kept pure, because any impurity may become a source of ignorance.

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 clearly anti-authoritarian and anti-traditionalist. For they require us to shed all beliefs except those whose truth we have perceived ourselves. And their attacks were certainly 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 judgment—to your judgment, 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 ago; 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 realisation 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 all important though unobtrusive doctrine, “Know thyself, and thus admit to thyself how little thou knowest!” Yet this doctrine was swept away by the theory that truth is manifest, and by the new self-assurance exemplified and taught in different ways by Luther, Bacon, and Descartes.

It is important to realise, in this connection, 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—by distinguishing, in the natural light of reason, between clear and distinct ideas whose source is God, and all the others 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 pre-

vail) which Nicolas and Erasmus, Montaigne and Locke and Voltaire, followed by John Stuart Mill and Bertrand Russell, makes 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.

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 had authority with respect to truth—Bacon's observations, Descartes' intellect—and into a lower part. It is this low 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 our 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 that the senses were not reliable either, and thus had no authority, was well known to the ancients, for example to Heraclitus and Parmenides and Democritus and Plato (though hardly to Epicurus).

It is strange that this teaching of antiquity could be almost ignored by modern empiricists, including phenomenologists and positivists; yet it is ignored in most of the problems posed by positivists and phenomenologists, and in the solutions they offer. The reason is clear. They still 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 by prejudice.²

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 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*). It has also played a role in the history of literature, and even in that of music.

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

² So our man-made language was at fault. But then it was discovered that our language too was "given" to us, in an important sense: that it embodied the wisdom and experience of many generations, and that it should not be blamed if we misuse 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 and will not hold him guiltless that taketh His words in vain, but will throw him into darkness and confusion.

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.

It is easy to see that the meaning of our words does have some connection 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 is 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 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 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 naivety; 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 by gaining knowledge of his *real* name.

Thus there is indeed a familiar as well as 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 dis-

tinctly 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.

I WILL NOW LEAVE all these largely historical reflections aside, and turn to the problems themselves, and to their solution.

This part might be described as a *criticism of 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 act, which is present to your memory or senses; or must allow that your belief is entirely without foundation. (*Enquiry Concerning Human Understanding*, Section v, Part 1.)

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.

The problem of the source 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) underlie your assertion?"

I find this string of questions quite unsatisfactory.

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 per-

haps "I read it in the *Encyclopædia 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 *Encyclopædia Britannica* got their information? Surely, if you only carry on your inquiry long enough, you will end up with reports of the observations of eye-witnesses (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 instance, 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 knowledge. 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 believe 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 appeal, as one might to a higher court or a higher authority—must be rejected as based upon a mistake.

First: 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 of eye-witnesses 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 into 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 corroborated 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,³ 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 eye-witnesses.

CLEARLY, no historian will accept the evidence of documents uncritically. There are problems of genuineness, there are 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 eye-witness 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 the eye-witnesses, they are important almost exclusively in a court of law where they can be cross-examined. As most lawyers know, eye-witnesses 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 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

³ See my *Logic of Scientific Discovery* (1956).

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.

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.

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 *Encyclopædia 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 *Encyclopædia*. 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 eye-witness of an experiment, but, if we doubt the result, we may repeat the experiment, or ask somebody else to repeat it.

⁴ It suggests, incidentally, such silly alternatives as "Whom do you want as rulers: the capitalists or the workers?"; analogous to "What is the ultimate source of knowledge: the intellect or the senses?"

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 historiography, 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 them, 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.

THE TRADITIONAL SYSTEMS of epistemology may be said to result from yes-answers or no-answers to the questions about the sources of 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."⁴ This political question is wrongly put and the answers which it elicits are paradoxical (as I have tried to show in chapter 7 of my *Open Society*). It should be replaced by a completely different question such as "*How can we organise 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.

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 legitimise 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 is guesswork, opinion—*doxa* rather than *epistemē*—as shown by his verses:

*The gods did not reveal, from the beginning,
All things to us; but in the course of time,
Through seeking, men find that which is the
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
Finality, he would himself not know it;
For all is but a woven web of guesses.*

Yet the traditional question of the authoritative sources of knowledge is repeated even to-day—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 *criticising* the theories or guesses of others and—if we can train ourselves to do so—by *criticising* our own theories or guesses.”⁵ 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 principal expresses his realisation 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:

Much as my words may startle you, you must not condemn me for saying: every man creates his God. From the moral point of view . . . you even have to create your God, in order to worship in Him your creator. For in whatever way 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 [by your conscience] to believe in Him, and to worship Him.⁶

In view of this bold statement, it seems strange that Kant did not adopt the same attitude—that of critical examination, of the critical search for error, in the field of science. I feel certain that it was only his acceptance of the authority of Newton’s 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 question “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

⁵ The latter point is highly desirable, but not indispensable; for if we fail to criticise our own theories, there may be others to do it for us.

⁶ Immanuel Kant, *Religion Within the Limits of Pure Reason*, 2nd edition (1794).

are interested in the problem which I tried to solve by my tentative assertion, you may help me by criticising 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 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.

IT IS HIGH TIME NOW, I think, to formulate the epistemological results of this discussion. I will put them in the form of nine 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, 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.⁷ 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 connection 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 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 criticise, how to take and 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 traditionalist 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 modifications 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.

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 *anamnesis* (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, often allow us to recognise error and falsity. Clarity and distinctness are not criteria of truth, but such things as obscurity and confusion indicate error. Similarly, coherence does not establish truth, but incoherence and inconsistency establish falsehood. And, when they are recognised, our own errors provide the dim red lights which help us in feeling our way out of the dark of our cave.

8. Neither observation nor reason are authorities. 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. 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 only

⁷ 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.

be 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*,

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.

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 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 supernatural).

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.

NOTES & TOPICS

With the Leopard

THE MOUNTAINS round Palermo have never looked so close as they do in this palpitating heat; there is something menacing about those great rocks thrusting sheer out of the plain, fit places for the ageless or the primeval, noon-day demons, centaurs, and the bandit Giuliano. Here in Sicily heat is like a ravening beast, another image to add to Lampedusa's many-sided Leopard. In the sun it crouches for a pounce, in the shade it attacks the innards and liquidates the will. Beneath it Palermo lies aquiver with suspense from the first moments after dawn. On main streets, near impenetrable slums, taut faces jostle and tension seems at breaking-point. But down at the end of one street, clearly visible from the centre of town, lies a symbol of coolness and escape, a white ship at anchor ready to sail for the Isles of the Hesperides with those who can afford the fare.

This heat emphasises two sides of the Sicilian character; one a yearning for the ineffable, death, or that mysterious "otherness" which impregnates Lampedusa's book; the other so diffused in the western part of the island that there is even a local name for it, *la tensione siciliana*. This pressure of unresolved opposites, with its corollary of torpor or languor, can be felt on arrival at Palermo's desert airport, Punta Raisa; it attenuates eastwards and is not felt along the coast at Cefalu. But in Palermo itself, and to the west and south, an exasperation is in the air which must shift the pivot of capital sins hereabouts from pride to impatience. Added to the normal tensions, the groupings and dis-integrations of a film-company on location it might be expected to make life on a "set" in the Sicilian summer almost unbearable. But in some way the two tensions even each other out. In the heat and dust the Roman cameramen, Milanese dressers, Bolognese interior decorators, potter round amiably, half-naked or in singlets and jeans as for road-mending, comrades in misfortune on alien soil. To most of them a summer in Sicily is like sweating it out on one of those convict islands that used to encircle the southern Italian coasts. The old dictum "No one travels south of Rome" has extended its meaning in recent years as the search for bathing beaches

spreads, but even now very few Italians from the mainland think of coming to Sicily for pleasure. To them it is a foreign country or a kind of colony whose appalling condition excites in them a mixture of guilt and contempt. The "troupe" of *The Leopard* wandering round Palermo in search of pleasure in off moments are conspicuous by their different faces, clothes, cars, and something in their bearing that emphasises detachment.

FILMING IS OF ITS VERY NATURE full of paradoxes; a particularly odd one here is that one of the members of the company most sensitive and sympathetic to Sicilian life and manners is an American, Burt Lancaster himself, the very actor whose choice for the key part of the Prince of Salina caused raised eyebrows. He has absorbed local atmosphere, visited the city's monuments, read background books on the island (at the moment he is investigating Dennis Mack Smith's views on Garibaldi and the Sicilian peasantry in 1860). His knowledge of the text of *The Leopard* is extraordinary; he has met and talked with almost everyone connected with the book. The actor's chameleon gift of sympathy, of entering an alien life and making it his own, has combined with a long-standing and very personal interest in the arts quite apart from acting. He has lived *The Leopard*, until as filming develops he is coming to represent more and more the spirit of the book, perhaps more aware than anyone on the set apart from the director how difficult it is to put a work of such verbal artistry into visual terms, and more determined to fill his dialogue with Lampedusa's poetic meaning. Mutual respect grows between himself and Italy's most meticulous and dynamic director, Luchino Visconti, whose view of the script is more sociological. Their heads are often to be seen together on the set animatedly discussing some point in the script. Their collaboration augurs well for the serious quality of a film in which a member of the new world has so fruitfully been brought in to redress the balance of the old.

The cinema has a way of holding a distorting mirror up to nature, and producing an image that is larger than life. These 175 aliens, Italians, French, with a smattering of British and Americans move through the Sicilian scene which they are here to "capture" with an uncanny resemblance to an invading force. The flag of the producing company, Titanus, floats from technical vehicles, caravans, and private transport of exotic and expensive design; and the route to a location in the remote interior such as Ciminna where the outdoor scenes of *Donna-fugata* are being filmed, is scattered with