

# Popper

Conjectures and Refutations

ROUTLEDGE



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# Conjectures and Refutations

**‘The central thesis of the essays and lectures gathered together in this stimulating volume is that our knowledge, and especially our scientific knowledge, progresses by unjustified (and unjustifiable) anticipations, by guesses, by tentative solutions to our problems, in a word by conjectures. Professor Popper puts forward his views with a refreshing self-confidence.’**

*The Times Literary Supplement*

**‘Professor Popper holds that truth is not manifest, but extremely elusive, he believes that modesty, open-mindedness, imagination, and a constant willingness to be corrected are the need above all things, open-mindedness, imagination, and a constant willingness to be corrected. In summarizing his views in this way, I have done scant justice to the subtlety and importance of his argument. His own presentation of his case is luminously clear.’**

*Maurice Cranston, The Listener*

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**Karl Popper**

**Conjectures and Refutations**

The Growth of Scientific Knowledge



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TO

F. A. VON HAYEK

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Experience is the name every one gives to their mistakes.

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OSCAR WIL

Our whole problem is to make the mistakes as fast as possible ...

JOHN ARCHIBALD WHEEL

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# PREFACE

The essays and lectures of which this book is composed are variations upon one very simple theme—the thesis that *we can learn from our mistakes*. They develop a theory of knowledge and of its growth. It is a theory of reason that assigns to rational arguments the modest and yet important role of criticizing our often mistaken attempts to solve our problems. And it is a theory of experience that assigns to our observations the equally modest and almost equally important role of tests which may help us in the discovery of our mistakes. Though it stresses our fallibility it does not resign itself to scepticism, for it also stresses the fact that knowledge can grow, and that science can progress—just because we can learn from our mistakes.

The way in which knowledge progresses, and especially our scientific knowledge, is by unjustified (and unjustifiable) anticipations, by guesses, by tentative solutions to our problems, by *conjectures*. These conjectures are controlled by criticism; that is, by attempted *refutations*, which include severe critical tests. They may survive these tests; but they can never be positively justified: they can be established neither as certainly true nor even as ‘probable’ (in the sense of the probability calculus). Criticism of our conjectures is of decisive importance: by bringing out our mistakes it makes us understand the difficulties of the problem which we are trying to solve. This is how we become better acquainted with our problem, and able to propose more mature solutions: the very refutation of a theory—that is, of any serious tentative solution to our problem—is always a step forward that takes us nearer to the truth. And this is how we can learn from our mistakes.

As we learn from our mistakes our knowledge grows, even though we may never know—that is, we may never know for certain. Since our knowledge can grow, there can be no reason here for despair of reason. And since we can never know for certain, there can be no authority here for any claim to authority, for conceit over our knowledge, or for smugness.

Those among our theories which turn out to be highly resistant to criticism, and which appear to be at a certain moment of time to be better approximations to truth than other known theories, may be described, together with the reports of their tests, as ‘the science’ of that time. Since none of them can be positively justified, it is essentially their critical and progressive character—the fact that we can *argue* about their claim to solve our problems better than their competitors—which constitutes the rationality of science.

This, in a nutshell, is the fundamental thesis developed in this book and applied to many topics ranging from problems of the philosophy and history of the physical sciences and of the social sciences to historical and political problems.

I have relied upon my central thesis to give unity to the book, and upon the diversity of my topics to make acceptable the marginal overlapping of some of the chapters. I have revised, augmented, and rewritten most of them, but I have refrained from changing the distinctive character of the lectures and

broadcast addresses. It would have been easy to get rid of the tell-tale style of the lecturer, but I thought that my readers would rather make allowances for that style than feel that they had not been taken into the author's confidence. I have let a few repetitions stand so that every chapter of the book remains self-contained.

As a hint to prospective reviewers I have also included a review—a severely critical one; it forms the last chapter of the book, and contains an essential part of my argument which is not stated elsewhere in it. I have excluded all those papers which presuppose acquaintance on the part of the reader with technicalities in the field of logic, probability theory, etc. But in the *Addenda* I have put together a few technical notes which may be useful to those who happen to be interested in the things. The *Addenda* and four of the chapters are published here for the first time.

To avoid misunderstandings I wish to make it quite clear that I use the terms 'liberal', 'liberalism' etc., always in a sense in which they are still generally used in England (though perhaps not in America): by a liberal I do not mean a sympathizer with any one political party but simply a man who values individual freedom and who is alive to the dangers inherent in all forms of power and authority.

*Berkeley, California, Spring 1962*

K. R.

# ACKNOWLEDGEMENTS

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The place and date of the first publication of the papers here collected are mentioned in each case at the bottom of the first page of each chapter. I wish to thank the editors of the various periodicals for giving me permission to include these papers in the present book.

I have been helped in various ways with the revision of the text, the reading of the proofs, and the preparation of the index, by Richard Gombrich, Lan Freed and Dr. Julius Freed, J. W. N. Watkins, Dr. William W. Bartley, Dr. Ian Jarvie, Bryan Magee, and A. E. Musgrave. I am greatly indebted to all of them for their help. My greatest indebtedness is to my wife. She has worked on the book even harder than I, and her acute criticism has led to innumerable improvements.

K. R.

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## PREFACE TO THE SECOND EDITION

This new edition contains, apart from a general revision of the text, a considerable amount of historical material which accumulated since the first edition was printed. As far as possible I have tried to leave the pagination unchanged so that references to the first edition will in almost all cases agree with the second edition. There is also an addition to the end of [chapter 5](#), and a new Addendum (6) at the end of the book. Alan Musgrave has completely revised the indexes, and has also given me much help with improvements to the body of the book.

Having tried, in my first Preface, to sum up my thesis in one sentence—that we can learn from our mistakes—I may perhaps add to it a word or two here. It is part of my thesis that *all* our knowledge grows *only* through the correcting of our mistakes. For example, what is called today ‘negative feedback’ is only an application of the general method of learning from our mistakes—the method of trial and error.

Now it appears that in order to apply this method we must already have *some aim*: we err if we stray from this aim. (A feedback thermostat depends on *some aim*—some definite temperature—which must be selected in advance.) Yet though in this way some aim must precede any particular instance of the trial and error method, this does not mean that our aims are not in their turn subject to the method. Any particular aim can be changed by trial and error, and many are so changed. (We can change the setting on our thermostat, selecting by trial and error one that better satisfies some aim—an aim of a different level.) And our system of aims not only *changes*, but it can also *grow* in a way closely similar to the way in which our knowledge grows.

*Penn, Buckinghamshire, January 1965*

K. R.

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# PREFACE TO THE THIRD EDITION

Apart from a great number of minor revisions several additions have been made to the text, among them a clearer statement of my views on Tarski's theory of truth (pp. 303 f.). There are also some new *Addenda*.

*Penn, Buckinghamshire, April 1968*

K. R.

# Introduction



But I shall let the little I have learnt go forth into the day in order that someone better than I may guess the truth, and in his work  
may prove and rebuke my error. At this I shall rejoice that I was yet a cause whereby such truth has come to light.\_\_\_\_\_

ALBRECHT DÜRER

I can now rejoice even in the falsification of a cherished theory, because even this is a scientific success.

JOHN CAREW ECCLES

# On the Sources of Knowledge and of Ignorance

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

BENEDICTUS DE SPINOZA

Every man carries about him a touchstone ... to distinguish ... truth from appearances.

JOHN LOCKE

... 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

The title of this lecture is likely, I fear, to offend some critical ears. 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?’<sup>1</sup> This question was put to me by a friend when I confided to him the title I had chosen for this lecture. Hard pressed for a reply I found myself improvising a rationalization, and explaining to my friend 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 unrecorded philosophical doctrines and among them (apart from the doctrine that *truth manifests*) especially to the *conspiracy theory of ignorance* which interprets ignorance not as a mere lack of knowledge but as the work of some sinister power, the source of impure and evil influences which pervert and poison our minds and instil in us the habit of resistance to knowledge.

I am not quite sure whether this explanation allayed my friend’s misgivings, but it did silence him. Your case is different since you are silenced by the rules of the present transactions. So I can only hope that I have allayed your misgivings sufficiently, for the time being, to allow me to begin my story at the other end—with the sources of knowledge rather than with the sources of ignorance. However, I shall presently come back to the sources of ignorance, and also to the conspiracy theory of these sources.

## I

The problem which I wish to examine afresh in this lecture, 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.

In this lecture I shall try to show of the two schools of empiricism and rationalism that the differences are much smaller than their similarities, and that both are mistaken. I hold that they are mistaken although I am myself 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 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.

## II

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 think Russell is right when he attributes to epistemology practical consequences for science, ethics, and even politics. For he says 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. (Cf. *Let the People Think*, 1941, pp. 77 ff.)

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 do not doubt that the 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 never fully realized in any particular legal case. But the 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.

### III

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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.<sup>2</sup> 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 *The Brothers Karamazov*.)

The contrast between epistemological pessimism and optimism may be said to be fundamental and 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 criticize, and to reject, any tradition, and any authority, as being based on sheer unreason or prejudice or accident.

### IV

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 (in the English sense of this term); 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 a searching 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 criticizing 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.

## V

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 conspiratorial theory of ignorance, which is a curious outgrowth from the doctrine of manifest truth.

By the doctrine that truth is manifest I mean, you will recall, the optimistic view that truth, if present before us naked, is always recognizable 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 the 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 eighteenth 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 the dissenters who held similar views about the Established Church. (Elsewhere I have traced the political history of this belief back to Plato's uncle Critias; see [chapter 8](#), section ii, of my *Open Society*.)

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*). Compare the French proverb, *La vérité triomphe toujours*.) 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. (See J. W. D. Watkins on Milton in *The Listener*, 22nd January 1959.) 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, with or 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 nonconformist 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.

## VI

This false epistemology, however, has also led to disastrous consequences. The theory that truth

manifest—that it is there for everyone to see, if only he wants to see it—this theory is the basis almost every kind of fanaticism. For only the most depraved wickedness can refuse to see the manifest truth; only those who have reason to fear truth 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 reaffirmation. 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. And 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.

## VII

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 (*The Rise of the Greek Epic*, 3rd edn., 1924, p. 96), '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 recognized. ... But most often he consults the Muses. ... So does Homer for such subjects as the Catalogue of the Greek army.'

As this quotation 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 (DK, <sup>3</sup>B 92, 32; cf. 93, 41, 64, 50). 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 Dikē, described by Heraclitus (DK, B 28) 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. (Cf. Heraclitus, B 54, 123; 88 and 126 hint at *unobservable* changing yielding observable opposites.) And even the principle of his physical theory which, like Descartes, is founded 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*, especially from 259e on; and in 275b–c Plato even insists, as Harold Cherniss pointed out to me, on the distinction between questions of origin and of truth.) Plato grants that the poets are inspired, but he 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 *anamnēsis* 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* (81b–d) 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. (On kinship and knowledge see also *Phaedo*, 79d; *Republic*, 611d; *Laws*, 899d.) In being born we forget; but we may recover our memory and our knowledge, though only partially: only if we see the truth again shall we recognize it. All knowledge is therefore re-cognition—recalling or remembering the essence or true nature that we once knew. (Cp. *Phaedo*, 72e ff.; 75e.)

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, or at least related to sin; cp. *Phaedo*, 76d.)

It is clear that there is a close link between this theory of *anamnēsis* 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 *anamnēsis* and the doctrine of manifest truth: if, even in our depraved state of forgetfulness, we see the truth, we cannot but recognize it as the truth. So, as the result of *anamnēsis*, 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 (514 ff.) 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 all but super-human, and only the very few, if anybody at all, can attain to the



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