Science in a Free Society

Paul Feyerabend
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Part Two

1. Two Questions

There are two questions that arise in the course of any discussion of science. They are:

(A) *What is science?* – how does it proceed, what are its results, how do its standards, procedures, results differ from the standards, procedures, results of other fields?

(B) *What's so great about science?* – what makes science preferable to other forms of existence, using different standards and getting different results as a consequence? What makes modern science preferable to the science of the Aristotelians, or to the cosmology of the Hopi?

Note that in trying to answer question (B) we are not permitted to judge the alternatives to science by scientific standards. When trying to answer question (B) we *examine* such standards, so we cannot make them the basis of our judgements.

Question A has not one answer, but many. Every school in the philosophy of science gives a different account of what science is and how it works. In addition there are the accounts given by scientists, politicians and by so-called spokesmen of the general public. We are not far from the truth when saying that the nature of science is still shrouded in darkness. Still, the matter is discussed and there is a chance that some modest knowledge about science will some day arise.

There exists hardly anyone who asks question B. The excellence of science is *assumed*, it is not *argued for*. Here scientists and philosophers of science act like the defenders of the One and Only Roman Church acted before them: Church doctrine is true, everything else is Pagan nonsense. Indeed, certain methods of discussion and insinuation that were once treasures of theological rhetoric have now found a new home in science.

This phenomenon, though remarkable and somewhat depressing, would hardly bother a sensible person if it were restricted to a small num-

ber of the faithful: in a free society there is room for many strange beliefs, doctrines, institutions. But the assumption of the inherent superiority of science has moved beyond science and has become an article of faith for almost everyone. Moreover, science is no longer a particular institution; it is now part of the basic fabric of democracy just as the Church was once part of the basic fabric of society. Of course, Church and State are now carefully separated. State and Science, however, work closely together.

Immense sums are spent on the improvement of scientific ideas. Bastard subjects such as the philosophy of science which shares with science the name but hardly anything else profit from the boom of the sciences. Human relations are subjected to scientific treatment as is shown by education programmes, proposals for prison reform, army training and so on. The power of the medical profession over every stage of our lives already exceeds the power once wielded by the Church. Almost all scientific subjects are compulsory subjects in our schools. While the parents of a six-year-old can decide to have him instructed in the rudiments of Protestantism, or in the rudiments of the Jewish faith, or to omit religious instruction altogether, they do not have similar freedom in the case of the sciences. Physics, astronomy, history *must* be learned; they cannot be replaced by magic, astrology, or by a study of legends.

Nor is one content with a merely *historical* presentation of physical (astronomical, biological, sociological etc.) facts and principles. One does not say: *some people believe* that the earth moves around the sun while others regard the earth as a hollow sphere that contains the sun, the planets, the fixed stars. One says: the earth *moves* round the sun – everything else is nonsense.

Finally, the manner in which we accept or reject scientific ideas is radically different from democratic decision procedures. We accept scientific laws and facts, we teach them in our schools, we make them the basis of important political decisions, but without having examined them, and without having subjected them to a vote. *Scientists* do not subject them to a vote, or at least this is what they tell us, and laymen certainly do not subject them to a vote. Concrete proposals are occasionally discussed, and a vote is suggested (nuclear reactor initiatives). But the procedure is not extended to general theories and scientific facts. Modern society is 'Copernican' not because Copernicus was put up for vote, discussed in a democratic way, and voted in with a simple majority; it is 'Copernican' because the *scientists* are Copernicans and because one accepts their cosmology as uncritically as one once accepted the cosmology of bishops and of cardinals.

Even bold and revolutionary thinkers bow to the judgement of science. Kropotkin wants to break up all existing institutions, but he does not touch science. Ibsen goes very far in his critique of bourgeois society, but he retains science as a measure of truth. Lévi Strauss has made us realize that Western thought is not the lonely peak of human achievement it was once thought to be, but he and his followers exclude science from their relativization of ideologies.[1] Marx and Engels were convinced that science would aid the workers in their quest for mental and social liberation.

Such an attitude made perfect sense in the 17th, 18th, even 19th centuries when science was one of many competing ideologies, when the state had not yet declared in its favour and when its determined pursuit was more than balanced by alternative views and alternative institutions. In those years science was a liberating force, not because it had found the truth, or the right method (though this was assumed to be *the* reason by the defenders of science), but because it restricted the influence of other ideologies and thus gave the individual room for thought. Nor was it necessary in those years to press a consideration of question B. The opponents of science who still were very much alive tried to show that science was on the wrong track, they belittled its importance and the scientists had to reply to the challenge. The methods and achievements of science were subjected to a critical debate. In this situation it made perfect sense to commit oneself to the cause of science. The very circumstances in which the commitment took place turned it into a liberating force.

It does not follow that the commitment has a liberating effect today. There is nothing in science or in any other ideology that makes them inherently liberating. Ideologies can deteriorate and become dogmatic religions (example: Marxism). They start deteriorating when they become successful, they turn into dogmas the moment the opposition is crushed: their triumph is their downfall. The development of science in the 19th and 20th centuries and especially after the Second World War is a good example. The very same enterprise that once gave man the ideas and the strength to free himself from the fears and the prejudices of a tyrannical religion now turns him into a slave of its interests. And let us not be deceived by the libertarian rhetoric and by the great show of

[1] Lévi Strauss (*The Savage Mind*, Chicago 1966, pp. 16ff.) denies that myth, being 'the product of man's "mythmaking faculty" turn[s] its back on reality'. He sees in it an approach to nature that complements science and is characterized by a 'universe of instruments [that is] closed' while the scientist will try new procedures to get new results. There can never be a conflict between the results of science and myth and so the question of their relative merit can

tolerance that some propagandists of science are putting on for our benefit. Let us ask whether they would be prepared to give, say the views of the Hopi the same role in basic education which science has today, let us ask a member of the AMA whether he would permit faithhealers into state hospitals and we shall soon see how narrow the limits of this tolerance really are. And, mind you, these limits are not the results of research; they are imposed quite arbitrarily as we shall see later on.

2. The Prevalence of Science a Threat to Democracy

This symbiosis of the state and of an unexamined science leads to an interesting problem for intellectuals and especially for liberals.

Liberal intellectuals are among the chief defenders of democracy and freedom. Loudly and persistently they proclaim and defend freedom of thought, speech, religion and, occasionally, some quite inane forms of political action.

Liberal intellectuals are also 'rationalists'. And they regard rationalism (which for them coincides with science) not just as one view among many, but as a basis for society. The freedom they defend is therefore granted under conditions that are no longer subjected to it. It is granted only to those who have already accepted part of the rationalist (i.e. scientific) ideology.[2]

For a long time this dogmatic element of liberalism was hardly noticed, let alone commented upon. There are various reasons for the oversight. When Blacks, Indians and other suppressed races first emerged into the broad daylight of civic life their leaders and their supporters among Whites demanded equality. But equality, 'racial' equality included, then did not mean *equality of traditions*; it meant *equality of access to one particular tradition* – the tradition of the White Man. The Whites who supported the demand opened the Promised Land – but it was a Promised Land built after their own specifications and furnished with their own favourite playthings.

The situation soon changed. An increasing number of individuals and

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never arise. Things look different to some Marxist critics. Thus M. Godelier ('Myth et Histoire', *Annales* 1971) lets myth transform the 'numerous objective data about nature into an "imaginative" explanation of reality' where 'objective data' are the data of science. Science, once more, has the upper hand.

[2] See n. 14, p. 29.

groups became critical of the gifts offered.[3] They either revived their own traditions or adopted traditions different both from rationalism and from the traditions of their forefathers. At this stage intellectuals started developing 'interpretations'. After all, they had studied non-Western tribes and cultures for quite some time. Many descendants of non-Western societies owe whatever knowledge they have of their ancestors to the work of white missionaries, adventurers, anthropologists, some of them with a liberal turn of mind.[4] When later anthropologists collected and systematized this knowledge they transformed it in an interesting way. The emphasized the psychological meaning, the social functions, the existential temper of a culture, they disregarded its ontological implications. According to them oracles, rain dances, the treatment of mind and body *express* the needs of the members of a society, they *function* as a social glue, they *reveal* basic structures of thought, they may even lead to an increased *awareness* of the relations between man and man and man and nature but without an accompanying *knowledge* of distant events, rain, mind, body. Such interpretations were hardly ever the result of critical thought – most of the time they were simply a consequence of popular antimetaphysical tendencies combined with a firm belief in the excellence first, of Christianity and then of science. This is how intellectuals, Marxists included aided by the forces of a society that is democratic in words only almost succeeded in having it both ways: they could pose as understanding friends of non-Western cultures without endangering the supremacy of their own religion: science.

The situation changed again. There are now individuals, some very gifted and imaginative scientists among them who are interested in a genuine revival not just of the externals of non-scientific forms of life but of the world views and practices (navigation, medicine, theory of life and matter) that were once connected with them. There are societies such as mainland China where traditional procedures have been combined with

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[3] White middle class Christians (and liberals, rationalists, even Marxists) felt great satisfaction when they finally offered Indians some of the marvellous opportunities of the great society they think they inhabit and they were displeased and offended when the reaction was disappointment, not abject gratitude. But why should an Indian who never even dreamt of imposing his culture on a white man now be grateful for having white culture imposed on him? Why should he be grateful to the white man who, having stolen his material possessions, his land, his living space now proceeds to steal his mind as well?

[4] Christian missionaries occasionally had a better grasp of the inherent rationality of 'barbaric' forms of life than their scientific successors and they were also greater humanitarians. As an example the reader should consult the work of Las Casas as described in Lewis Hanke *All Mankind is One*, Northern Illinois Press 1974.

scientific views leading to a better understanding of nature and a better treatment of individual and social dysfunction. And with this the hidden dogmatism of our modern friends of freedom becomes revealed: democratic principles as they are practised today are incompatible with the undisturbed existence, development, growth of special cultures. A rational-liberal (-Marxist) society cannot contain a Black culture in the full sense of the word. It cannot contain a Jewish culture in the full sense of the word. It cannot contain a mediaeval culture in the full sense of the word. It can contain these cultures only as secondary grafts on a basic structure that is an unholy alliance of science, rationalism (and capitalism).[5]

But – so the impatient believer in rationalism and science is liable to exclaim – is this procedure not justified? Is there not a tremendous difference between science on the one side, religion, magic, myth on the other? Is this difference not so large and so obvious that it is unnecessary to point it out and silly to deny it? Does the difference not consist in the fact that magic, religion, mythical world views *try* to get in touch with reality while science *has succeeded* in this business and so supersedes its ancestors? Is it therefore not only justified but also required to remove an ontologically potent religion, a myth that claims to describe the world, a system of magic that poses as an alternative to science from the centre of society and to replace them by science? These are some of the questions which the 'educated' liberal (and the 'educated' Marxist) will use to object to any form of freedom that interferes with the central position of science and (liberal or Marxist) rationalism.

Three assumptions are contained in these rhetorical questions.

Assumption A: scientific rationalism is preferable to alternative traditions.

Assumption B: it cannot be improved by a comparison and/or combination with alternative traditions.

Assumption C: it must be accepted, made a basis of society and education because of its advantages.

[5] Professor Agassi, see Part Three, Chapter One, has read this passage as suggesting that Jews *should* return to the traditions of their forefathers, that American Indians *should* resume their old ways, rain dances included, and he has commented on the 'reactionary' character of such suggestions. Reactionary? This assumes that the step into science and technology was not a mistake – which is the question at issue. It also assumes, for example, that rain dances don't work – but who has examined that matter? Besides, I do not make the suggestion Agassi ascribes to me. I don't say that American Indians (for example) *should resume* their old ways, I say that those who *want to resume them* should be able to do so first, because in a democracy everyone should be able to live as he sees fit and second, because no ideology and no way of life is so perfect that it cannot learn from a comparison with alternatives.

In what follows I shall try to show that neither assumption A nor assumption B agrees with the facts where 'facts' are defined in accordance with the type of rationalism implicit in A and B: *rationalists and scientists cannot rationally (scientifically) argue for the unique position of their favourite ideology.*

However, assume they can – does it follow that their ideology must now be imposed on everyone (question C)? Is it not rather the case that traditions that give substance to the lives of people must be given equal rights and equal access to key positions in society *no matter what other traditions think about them*? Must we not demand that ideas and procedures that give substance to the lives of people be made full members of a free society *no matter what other traditions think about them*?

There are many people who regard such questions as an invitation to *relativism.* Reformulating them in their own favourite terms they ask us whether we would want to give falsehood the same rights as truth, or whether we would want dreams to be treated as seriously as accounts of reality. From the very beginning of Western Civilization insinuations such as these were used to defend one view, one procedure, one way of thinking and acting to the exclusion of everything else.[6] So, let us take the bull by its horns and let us take a closer look at this frightful monster: relativism.

3. The Spectre of Relativism

With the discussion of relativism we enter territory full of treacherous paths, traps, footangles, territory where appeals to emotion count as arguments and where arguments are of a touching simplemindedness. Relativism is often attacked not because one has found a fault, but because one is afraid of it. Intellectuals are afraid of it because relativism threatens their role in society just as the enlightenment once threatened

[6] In Plutarch's *Life of Solon* we find the following story: 'When the company of Thespis began to exhibit tragedy, and its novelty was attracting the populace but had not yet gone as far as public competition, Solon being fond of listening and learning and being rather given in his old age to leisure and amusements, and indeed to drinking parties and music, went to see Thespis act in his own play, as was the practice of ancient times. Solon approached him after the performance and asked him if he was not ashamed to tell so many lies to so many people. When Thespis said there was nothing dreadful in representing such works and actions in fun, Solon struck the ground violently with his walking stick: "If we applaud these things in fun" he said "we shall soon find ourselves honouring them in earnest". Thus began the 'long standing quarrel between poetry and philosophy' (Plato *Republic* 607b6f.), i.e. between those seeing everything in terms of truth and falsehood, and other traditions.

the existence of priests and theologians. And the general public which is educated, exploited and tyrannized by intellectuals has learned long ago to identify relativism with cultural (social) decay. This is how relativism was attacked in Germany's Third Reich, this is how it is attacked again today by Fascists, Marxists, Critical Rationalists. Even the most tolerant people dare not say that they reject an idea or a way of life because they don't like it – which would put the blame on them entirely – they have to add that there are *objective* reasons for their action – which puts at least part of the blame on the thing rejected and on those enamoured by it. What is it about relativism that seems to put the fear of god into everyone?

It is the realization that one's own most cherished point of view may turn out to be just one of many ways of arranging life, important for those brought up in the corresponding tradition, utterly uninteresting and perhaps even a hindrance to others. Only few people are content with being able to think and live in a way pleasing to themselves and would not dream of making their tradition an obligation for everyone. For the great majority – and that includes Christians, rationalists, liberals and a good many Marxists – there exists only one truth and it must prevail. Tolerance does not mean acceptance of falsehood side by side with truth, it means human treatment of those unfortunately caught in falsehood.[7] Relativism would put an end to this comfortable exercise in superiority – therefore the aversion.

Fear of moral and political chaos increases the aversion by adding practical disadvantages to the intellectual drawbacks. Relativists, it is said, have no reason to respect the laws of the society to which they belong, they have no reason to keep promises, honour business contracts, respect the lives of others, they are like beasts following the whim of the moment and like beasts they constitute a danger to civilized life.

It is interesting to see how closely this account mirrors the complaints of Christians who witnessed the gradual removal of *religion* from the centre of society. The fears, insinuations and predictions were then exactly the same – but they did not come true. Replacing religion by rationalism and science did not create paradise – far from it – but it did not create chaos either.

It did not create chaos, it is pointed out, because rationalism is itself an orderly philosophy. One order was replaced by another order. But relativism wants to remove *all* ideological ingredients (except those that are convenient, for the time being). Is it possible to have such a society?

[7] Cf. Henry Kamen, *The Rise of Toleration*, New York 1967.

Can it work? How will it work? These are the questions we have to answer.

Starting with the intellectual (or semantic) difficulties viz. the insinuation that relativism means giving the same rights to truth and falsehood (reason and insanity, virtue and viciousness and so on) we need only remind the reader of theses i. and ii. of Section 2, Part One and the associated explanations. We saw then that classifying traditions as true or false (. . . etc. . . .) means projecting the point of view of other traditions upon them. Traditions are neither good nor bad – they just are. They obtain desirable or undesirable properties only for an agent who participates in another tradition and projects the values of this tradition upon the world. The projections *appear* '*objective*' i.e. tradition-independent and the statements expressing its judgements *sound* '*objective*' because the subject and the tradition he represents nowhere occur in them. They *are* '*subjective*' because this non-occurrence is due to an oversight. The oversight is revealed when the agent adopts another tradition: his value-judgements change. Trying to account for the change the agent has to revise the content of all his value statements just as physicists had to revise the content of even the simplest statement about length when it was discovered that length depends on the reference system. Those who don't carry out the revision cannot pride themselves on forming a special school of especially astute philosophers who have withstood the onslaught of moral relativism just as those who still cling to absolute lengths cannot pride themselves on forming a special school of especially astute physicists who have withstood the onslaught of relativity. They are just pig-headed, or badly informed, or both. So much about seeing relativism in terms of equal rights for falsehood, irrationality, viciousness and so on.

That the appeal to truth and rationality is rhetorical and without objective content becomes clear from the inarticulateness of its defence. In Section 1 we have seen that the question 'What is so great about science?' is hardly ever asked and has no satisfactory answer. The same is true of other basic concepts.[8] Philosophers inquire into the nature of truth, or the nature of knowledge, but they hardly ever ask why truth should be pursued (the question arises only at the boundary line of traditions – for example, it arose at the boundary line of science and Christianity). The very same notions of Truth, Rationality, Reality that are supposed to eliminate relativism are surrounded by a vast area of

[8] Can I use 'truth' when criticizing its uncritical use? Of course I can, just as one can use German to explain the disadvantages of German and the advantages of Latin to a German audience.

ignorance (which corresponds to the arguer's ignorance of the tradition that provides the material for his rhetorical displays).

There is therefore hardly any difference between the members of a 'primitive' tribe who defend their laws because they are the laws of their gods, or of their ancestors and who spread these laws in the name of the tribe and a rationalist who appeals to 'objective' standards, except that the former know what they are doing while the latter does not.[9]

This concludes the intellectual, or 'semantic' part of the debate about relativism.

Turning now to the political problems we can start by pointing out that many of them are entirely imaginary. The assumption that they plague only relativists and resist solution except within the framework of a particular tradition (Christianity, Rationalism) is simply slander – aided by insufficient analysis. For we must distinguish between political relativism and philosophical relativism and we must separate the psychological attitude of relativists from both. *Political relativism* affirms that all traditions have equal *rights*: the mere fact that some people have arranged their lives in accordance with a certain tradition suffices to provide this tradition with all the basic rights of the society in which it occurs.

[9] The rules of a rational science, liberal intellectuals say, do not involve special interests. They are 'objective' in the sense that they emphasize truth, reason etc. all of which are independent of the beliefs and wishes of special interest groups. Distinguishing between the *validity* of a demand, a rule, a suggestion and the fact that the demand, rule, suggestion is *accepted* critical rationalists seem to turn knowledge and morals from tribal ideologies into the representation of tribe-independent circumstances. But tribal ideologies do not cease to be tribal ideologies on account of not being openly characterized as such. The demands which rationalists defend and the notions they use *speak* 'objectively' and not in the name of Sir Karl Popper or Professor Gerard Radnitzky because *they have been made to speak that way* and not because the interests of Sir Karl or of Professor Radnitzky are no longer taken into account; and they have been made to speak that way to secure them a wider audience, to keep up the pretence of libertarianism and because rationalists have little sense for what one might call the 'existential' qualities of life. Their 'objectivity' is in no way different from the 'objectivity' of a colonial official who, having read a book or two now ceases to address the natives in the name of the King and addresses them in the name of Reason instead or from the 'objectivity' of a drill sergeant who instead of shouting 'now, you dogs, listen to me – this is what I want you to do and God have mercy on you if you don't do exactly what I tell you!' purrs 'Well, I think what we ought to do is . . .'. Obedience to the commands and the ideology of the speaker is demanded in either case. The situation becomes even clearer when we examine how rationalists argue. They posit a 'truth' and 'objective' methods for finding it. If the necessary concepts and methods are known to all the parties in the debate, then nothing further needs to be said. The debate can start right away. If one party does not know the methods, or uses methods of its own then it must be *educated* which means *it is not taken seriously* unless its procedure coincides with the procedure of the rationalist. Arguments are tribe-centred and the rationalist is the master.

A 'more philosophical' argument might support such a procedure by pointing out that traditions are neither good nor bad but simply are (Part One, Section 2, Thesis 1), that they assume positive or negative qualities only when viewed through the spectacles of other traditions (Thesis ii) and that the judgement of those who live in accordance with the tradition is to be given preference. *Philosophical relativism* is the doctrine that all traditions, theories, ideas are equally true or equally false or, in an even more radical formulation, that any distribution of truth values over traditions is acceptable. This form of relativism is nowhere defended in the present book. It is not asserted, for example, that Aristotle is as good as Einstein, it is asserted and argued that 'Aristotle is true' is a judgement that presupposes a certain tradition, it is a relational judgement that *may* change when the underlying tradition is changed. There *may* exist a tradition for which Aristotle is as true as Einstein, but there are other traditions for which Einstein is too uninteresting for examination. Value judgements are not 'objective' and cannot be used to push aside the 'subjective' opinions that emerge from different traditions. I also argue that the appearance of objectivity that is attached to some value judgements comes from the fact that a particular tradition is *used* but not *recognized*: absence of the impression of subjectivity is not proof of 'objectivity' but of an oversight.

Turning now to the *attitudes* of relativists we must distinguish between (a) members of a relativistic society and (b) philosophical relativists. Among the former we shall find all attitudes from sheer dogmatism combined with a strong urge to proselytize to an out-and-out liberalism/cynicism. Political relativism makes assertions about *rights* (and about protective structures defending these rights) – not about beliefs, attitudes etc. Philosophical relativists, on the other side, may again have all sorts of attitudes, punctilious obedience to the law included.

Now one seems to assume that acceptance of political relativism will drastically increase the number of those who only want to please themselves and that everybody will be subjected to their whims. I regard this assumption as most implausible. Only few of the traditions of a relativistic society will be lawless – most of them will regiment their members even more strongly than is done in the so-called 'civilized societies' of today. The assumption also insinuates that it is lack of indoctrination and not lack of choice that is responsible for the drastic increase of the crime rate we observe today so that it is not fear of retaliation but the proper education that makes people behave decently – a wildly implausible theory. Christianity preached love for mankind and burned, killed, maimed

hundreds of thousands of people. The French Revolution preached Reason and Virtue and ended up in an ocean of blood. The USA were built on the right to liberty and the pursuit of happiness for all – and yet there was slavery, suppression, intimidation. One could of course insist that the failure was due to inefficient methods of education – but 'more efficient' methods would be neither wise nor humane. Eradicate the ability to kill – and people may lose their passion. Eradicate the ability to lie – and imagination which always goes against the truth of the moment might disappear as well (cf. n. 6). An 'education' in virtue might easily make people incapable of being wicked by making them incapable of being people – a large price to pay for results that can be achieved in other ways. And that there are such other ways is openly admitted by the anti-relativists. Far from trusting the force of the ideology whose importance they emphasize with such passion they protect society by laws, courts, prisons, and an efficient police force. But a police force can be used by relativists as well, for – and with this we come to the second part of the assumption at the beginning of this paragraph – such a society will not be and cannot be without protective devices. It is to be admitted that speaking of police, prisons, protection does not sound good in the ears of those concerned with freedom. However a universal training in virtue and rationality that obliterates traditions and is liable to create meek zombies is an even greater threat to it. What kind of protection is better – the inefficient protection that comes from interfering with the soul or the much more efficient *external* protection that *leaves souls intact* and only restricts our movements?

A relativistic society will therefore contain a *basic protective structure.* This leads to the next argument for rationalism (or some similar central protective ideology): must not the structure be 'just'? Must it not be shielded from undue influence? Must there not be an 'objective' way of settling disputes about it which means – is there not again a need for rationalism over and above particular traditions?

To answer this question we need only realize that protective frameworks are not introduced out of the blue but in a concrete historical situation and that it is this situation and not an abstract discussion of 'justice' or 'rationality' that determines the process. People living in a society that does not give their tradition the rights they think it deserves will work towards a change. To effect the change, they will use the most efficient means available. They will use existing laws, if that is going to help their cause, they will 'argue rationally' when rational argument is required, they will engage in an open debate (cf. the explanations to

Part One, Section 2, Thesis viii.) where the representatives of the status quo have no fixed opinion and no fixed procedure, they will organize an uprising if there seems no other way. To demand that they restrict their efforts to what is rationally admissible may at that stage be as sensible as the demand to reason with a wall. Besides, why should they worry about 'objectivity' when their aim is to make themselves heard in one-sided, i.e. 'subjective', surroundings?

The situation is different when tribes, cultures, people who are not part of any one state move into the same area and now have to live together. An example are Babylonians, Egyptians, Greeks, Mitanni, Hittites and the many other peoples who had interests in Asia Minor. They learned from each other and created the 'First Internationalism' (Brestead) of 1600 to 1200 B.C. Tolerance of different traditions and different creeds was considerable and by far exceeded the tolerance which Christians later showed towards alternative forms of life. The Yassaq of Genghis Khan which proclaims the same rights for all religons shows that history does not always progress and that the 'modern mind' may be far behind some 'savages' as regards reasonableness, practicality and tolerance.

The third case is that of a relativistic society with a protective structure already installed. This is the case which rationalists seem to have in mind. We want to improve the protective structure. The improvement, rationalists say, must not be done arbitrarily, there must not be undue influence, objective standards must determine every single step. But why should the standards that guide an exchange between traditions be imposed from the outside? In Part One we have seen that the relation between Reason and Practice is a dialectical relation: traditions are guided by standards which are in turn judged by the way in which they influence them. The same is true of the standards that guide the exchange between the various traditions of a free society. These standards are again determined, improved, refined, eliminated by the traditions themselves or, to use terms explained in the same place – *the exchange between traditions is an open exchange, not a rational exchange.* Insinuating that the internal business of a society must follow 'objective' rules, pointing out that they are the foremost inventors, guardians, polishers of rules, intellectuals have so far succeeded in interposing themselves between the traditions concerned and their problems. They have succeeded in preventing a more direct democracy where problems are solved and solutions judged by those who suffer from the problems and have to live with the solutions and they have fattened themselves on the funds thus diverted in their direction. It is time to realize that they are just one special and rather

greedy group held together by a special and rather aggressive tradition equal in rights to Christians, Taoists, Cannibals, Black Muslims but often lacking their understanding of humanitarian issues. It is time to realize that science, too, is a special tradition and that its predominance must be reversed by an open debate in which all members of the society participate.

But – and with this we proceed to question A of Section 2 – will such a debate not soon discover the overwhelming excellence of science and thus restore the status quo? And if it doesn't – does this not show the ignorance and incompetence of laymen? And if that is so, is it then not better to leave things as they are instead of disturbing them by useless and time-consuming changes?

4. Democratic Judgement overrules 'Truth' and Expert Opinion

There are two aspects to this question. One concerns the *rights* of citizens and traditions in a free society, the other the (perhaps disadvantageous) consequences of an *exercise* of these rights.

In a democracy an individual citizen has the right to read, write, to make propaganda for whatever strikes his fancy. If he falls ill, he has the right to be treated in accordance with his wishes, by faithhealers, if he believes in the art of faithhealing, by scientific doctors, if he has greater confidence in science. And he has not only the right to accept, live in accordance with, and spread ideas *as an individual*, he can *form associations* which support his point of view provided he can finance them, or find people willing to give him financial support. This right is given to the citizen for two reasons; first, because everyone must be able to pursue what he *thinks* is truth, or the correct procedure; and, secondly, because the only way of arriving at a useful judgement of what is supposed to be the truth, or the correct procedure is to become acquainted with the widest possible range of alternatives. The reasons were explained by Mill in his immortal essay *On Liberty*. It is not possible to improve upon his arguments.

Assuming this right, a citizen has a say in the running of any institution to which he makes a financial contribution, either privately, or as a tax-payer: state colleges, state universities, tax supported research institutions such as the National Science Foundation are subjected to the

judgement of taxpayers, and so is every local elementary school. If the taxpayers of California want their state universities to teach Voodoo, folk medicine, astrology, rain dance ceremonies, then this is what the universities will have to teach. Expert opinion will of course be taken into consideration, but experts will not have the last word. The last word is the decision of democratically constituted committees, and in these committees laymen have the upper hand.

But do laymen possess the knowledge that is needed for decisions of this kind? Will they not commit grievous mistakes? And is it not therefore necessary to leave fundamental decisions to the experts?

Certainly not in a democracy.

A democracy is an assembly of mature people and not a collection of sheep guided by a small clique of know-it-alls. Maturity is not found lying about in the streets, it must be learned. It is not learned in schools, at least not in the schools of today where the student is confronted with desiccated and falsified *copies* of *past decisions*, it is learned by *active participation* in decisions that are still to be made. Maturity is more important than special knowledge and it must be pursued even if the pursuit should interfere with the delicate and refined charades of the scientists. After all, we have to decide how special forms of knowledge are to be applied, how far they may be trusted, what their relation is to the *totality* of human existence and, therefore, to other forms of knowledge. Scientists, of course, assume that there is nothing better than science. The citizens of a democracy cannot rest content with such a pious faith. Participation of laymen in fundamental decisions is therefore required *even if it should lower the success rate of the decisions.*

The situation I have just described has many similarities with the situation in a case of war. In a war a totalitarian state has a free hand. No humanitarian considerations restrict its tactics; the only restrictions are those of material, ingenuity, manpower. A democracy, on the other hand, is supposed to treat the enemy in a humane fashion *even if this should lower the chances of victory.* It is true that only few democracies ever live up to such standards but those that do make an important contribution to the advancement of our civilization. In the domain of thought the situation is exactly the same. We must realize that there are more important things in this world than winning a war, advancing science, finding the truth. Besides, it is not at all certain that taking fundamental decisions out of the hands of experts and leaving them to laymen is going to lower the success rate of the decisions.

5. Expert Opinion often Prejudiced, Untrustworthy, and in Need of Outside Control

To start with, experts often arrive at different results, both in fundamental matters, and in application. Who does not know of at least one case in his family where one doctor recommends a certain operation, another argues against it, while a third suggests an entirely different procedure? Who has not read of the debates about nuclear safety, the state of the economy, the effects of pesticides, aerosol sprays, the efficiency of methods of education, the influence of race on intelligence? Two, three, five and even more views arise in such debates, and scientific supporters can be found for all of them. Occasionally one almost feels inclined to say: as many scientists, as many opinions. There are of course areas in which scientists agree – but this cannot raise our confidence. Unanimity is often the result of a *political* decision: dissenters are suppressed, or remain silent to preserve the reputation of science as a source of trustworthy and almost infallible knowledge. On other occasions unanimity is the result of shared prejudices: positions are taken without detailed examination of the matter under review and are infused with the same authority that proceeds from detailed research. The attitude towards astrology which I shall discuss presently is an example. Then again unanimity may indicate a decrease of critical consciousness: criticism remains faint as long as only one view is being considered. This is the reason why a unanimity that rests on 'internal' considerations alone often turns out to be mistaken.

Such mistakes *can be* discovered by laymen and dilettantes, and often *have been* discovered by them. Inventors built 'impossible' machines and made 'impossible' discoveries. Science was advanced by outsiders, or by scientists with an unusual background. Einstein, Bohr, Born were dilettantes, and said so on numerous occasions. Schliemann who refuted the idea that myth and legend have no factual content started as a successful businessman, Alexander Marshack who refuted the idea that Stone Age man was incapable of complex thought as a journalist, Robert Ardrey was a playwright and came to anthropology because of his belief in the close relation between science and poetry, Columbus had no university education and had to learn Latin late in his life, Robert Mayer knew just the bare outlines of early 19th century physics, the Chinese communists of the Fifties who forced traditional medicine back into the universities and thereby started most interesting lines of research the world over had

only little knowledge of the intricacies of scientific medicine. How is this possible? How is it possible that the ignorant, or ill-informed can occasionally do better than those who know a subject inside out?

One answer is connected with the very *nature of knowledge*. Every piece of knowledge contains valuable ingredients side by side with ideas that prevent the discovery of new things. Such ideas are not simply errors. They are necessary for research: progress in one direction cannot be achieved without blocking progress in another. But research in that 'other' direction may reveal that the 'progress' achieved so far is but a chimera. It may seriously undermine the authority of the field as a whole. Thus science needs both the *narrowmindedness* that puts obstacles in the path of an unchained curiosity and the *ignorance* that either disregards the obstacles, or is incapable of perceiving them.[10] Science needs both the expert and the dilettante.[11]

Another answer is that scientists quite often just don't know what they are talking about. They have strong opinions, they know some standard arguments for these opinions, they may even know some results outside the particular field in which they are doing research but most of the time they depend, and have to depend (because of specialization) on *gossip* and *rumours*. No special intelligence, no technical knowledge is needed to find this out. Anyone with some perseverance can make the discovery and he will then also find that many of the rumours that are presented with such assurance are nothing but simple mistakes.

Thus R. A. Millikan, Nobel Prize Winner in Physics writes in *Reviews*

[10] Ignorance of established school doctrines helped Galileo in his research. Ignorance made others adopt the results of his research, despite grave observational and conceptual difficulties. This is shown in Chapters 9–11 and Appendix 2 of *AM*.

[11] It is interesting to see that the demands of the new experimental philosophy that appeared in the 17th century eliminated not just hypotheses, or methods, *but the very effects* whose spuriousness was afterwards said to have been proved by scientific research: parapsychological effects and effects showing a harmony between microcosm and macrocosm depend on a state of mind (and, in the case of large scale phenomena, of society) that is eliminated by the demand for 'unprejudiced and neutral observers'; these effects increase with excitement, a global approach and a close correlation of spiritual and material agencies. They decrease and almost disappear when a cool and analytical approach is taken, or when religion and theology are separated from the study of inert matter. Thus scientific empiricism eliminated its spiritualistic rivals, it eliminated the followers of Agrippa of Nettesheim, John Dee, Robert Fludd not by giving a better account of a world *that existed independently of either view*, but by using a method that did not permit 'spiritual' effects to arise. It *removed* such effects and then described the impoverished world *insinuating that no change had taken place*. James I who did not feel too comfortable with spirits could only welcome such a development and we have reasons to assume that 'scientists' craving for Royal patronage arranged their science accordingly. Bacon's changing attitude towards magic should be seen in this light also: cf. F. Yates, *The Rosicrucian Enlightenment*, London 1974.

of Modern Physics, Vol. 29 (1949), p. 344: 'Einstein called out to us all – "let us merely accept this (the Michelson experiment) as an established experimental fact and from there proceed to work out its inevitable consequences" – and he went at the task himself with an energy and a capacity which very few people on earth possess. Thus was born the special theory of relativity'.

The quotation suggests that Einstein starts with the description of an experiment, that he urges us to lay aside prior ideas and to concentrate on the experiment alone, that he himself abandons such ideas, and that using this method he arrives at the special theory of relativity. One has only to read Einstein's paper of 1905 to realize that he proceeds in an entirely different way. There is no mention of the Michelson-Morley experiment or, for that matter, of any particular experiment. The starting point of the argument is not an experiment, but a 'conjecture' and Einstein's suggestion is, not to eliminate the 'conjecture', but to 'raise (it) into a principle' – the very opposite of what Millikan describes Einstein as doing. This can be verified by anyone who is able to read, without special knowledge of physics, for the passage occurs in the first and non-mathematical part of Einstein's paper.

Another and more technical example is the so-called *Neumann proof*. In the Thirties there existed two major interpretations of the quantum theory. According to the first interpretation quantum theory is a statistical theory, like statistical mechanics, and the uncertainties are uncertainties of knowledge, not uncertainties of nature. According to the second interpretation the uncertainties do not merely express our ignorance, they are inherent in nature: states that are more definite than indicated by the uncertainty relations simply do not exist. The second interpretation was defended by Bohr who offered a variety of qualitative arguments and by Heisenberg who illustrated it with simple examples. In addition there was a somewhat complicated proof by von Neumann allegedly showing that quantum mechanics was incompatible with the first view. Now at meetings up to the Fifties the discussion usually went like this. First the defenders of the second interpretation presented their arguments. Then the opponents raised objections. The objections were occasionally quite formidable and could not be easily answered. Then somebody said 'but von Neumann has shown . . .' and with this the opposition was silenced and the second interpretation saved. It was saved not because von Neumann's proof was so well known but because the mere name 'von Neumann' was an authority to overrule any objection. It was saved because of the force of an authoritative *rumour*.

At this point the similarity between 'modern' science and the Middle Ages becomes rather striking. Who does not remember how objections were defused by reference to Aristotle? Who has not heard of the many rumours (such as the rumour that the young of a lion are born dead and licked to life by their mother) that were handed on from generation to generation and formed decisive parts of mediaeval knowledge? Who has not read with indignation how observations were rejected by reference to theories which were just further rumours and who has not either himself pontificated or heard others pontificate on the excellence of modern science in this respect? The examples show that the difference between modern science and 'mediaeval' science is at most a matter of degree and that the same phenomena occur in both. The similarity increases when we consider how scientific institutions try to impose their will on the rest of society.[12]

6. The Strange Case of Astrology

To drive the point home I shall briefly discuss the 'Statement of 186 leading Scientists' against astrology which appeared in the September/October issue 1975 of the *Humanist*. This statement consists of four parts. First, there is the statement proper which takes about one page. Next come 186 signatures by astronomers, physicists, mathematicians, philosophers and individuals with unspecified professions, eighteen Nobel Prize Winners among them. Then we have two articles explaining the case against astrology in some detail.

Now what surprises the reader whose image of science has been formed by the customary eulogies which emphasize rationality, objectivity, impartiality and so on is the religious tone of the document, the illiteracy of the 'arguments' and the authoritarian manner in which the arguments are being presented. The learned gentlemen have strong convictions, they use their authority to spread these convictions (why 186 signatures if one has arguments?), they know a few phrases which sound like arguments, but they certainly do not know what they are talking about.[13]

[12] Numerous examples in Robert Jungk, *Der Atomstaat*, Munich 1977.

[13] This is quite literally true. When a representative of the BBC wanted to interview some of the Nobel Prize Winners they declined with the remark that they had never studied astrology and had no idea of its details. Which did not prevent them from cursing it in public. In the case of Velikowski the situation was exactly the same. Many of the scientists

Take the first sentence of the 'Statement'. It reads: 'Scientists in a variety of fields have become concerned about the increased acceptance of astrology in many parts of the world.'

In 1484 the Roman Catholic Church published the *Malleus Maleficarum*, the outstanding textbook on witchcraft. The *Malleus* is a very interesting book. It has four parts: phenomena, aetiology, legal aspects, theological aspects of witchcraft. The description of phenomena is sufficiently detailed to enable us to identify the mental disturbances that accompanied some cases. The aetiology is pluralistic, there is not just the official explanation, there are other explanations as well, purely materialistic explanations included. Of course, in the end only one of the offered explanations is accepted, but the alternatives are discussed and so one can judge the arguments that lead to their elimination. This feature makes the *Malleus* superior to almost every physics, biology, chemistry textbook of today. Even the theology is pluralistic, heretical views are not passed over in silence, nor are they ridiculed; they are described, examined, and removed by argument. The authors know the subject, they know their opponents, they give a correct account of the positions of their opponents, they argue against these positions and they use the best knowledge available at the time in their arguments.

The book has an introduction, a bull by Pope Innocent VIII, issued in 1484. The bull reads: 'It has indeed come to our ears, not without afflicting us with bitter sorrow, that in . . .' – and now comes a long list of countries and counties – 'many persons of both sexes, unmindful of their own salvation have strayed from the Catholic Faith and have abandoned themselves to devils . . .' and so on. The words are almost the same as the words in the beginning of the 'Statement', and so are the sentiments expressed. Both the Pope and the '186 leading scientists' deplore the increasing popularity of what they think are disreputable views. But what a difference in literacy and scholarship!

Comparing the *Malleus* with accounts of contemporary knowledge the reader can easily verify that the Pope and his learned authors knew what they were talking about. This cannot be said of our scientists. They neither know the subject they attack, astrology, nor those parts of their own science that undermine their attack.

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who tried to prevent the publication of Velikowski's first book or who wrote against it once it had been published never read a page of it but relied on gossip or on newspaper accounts. This is a matter of record. Cf. de Grazia, *The Velikowski Affair*, New York 1966, as well as the essays in *Velikovsky Reconsidered*, New York 1976. As usual the greatest assurance goes hand in hand with the greatest ignorance.

Thus Professor Bok, in the first article that is attached to the statement writes as follows: 'All I can do is state clearly and unequivocally that modern concepts of astronomy and space physics give no support – better said, negative support – to the tenets of astrology' i.e. to the assumption that celestial events such as the positions of the planets, of the moon, of the sun influence human affairs. Now, 'modern concepts of astronomy and space physics' include large planetary plasmas and a solar atmosphere that extends far beyond the earth into space. The plasmas interact with the sun and with each other. The interaction leads to a dependence of solar activity on the relative positions of the planets. Watching the planets one can predict certain features of solar activity with great precision. Solar activity influences the quality of short wave radio signals hence fluctuations in this quality can be predicted from the position of the planets as well.[14]

Solar activity has a profound influence on life. This was known for a long time. What was not known was how delicate this influence really is. Variations in the electric potential of trees depend not only on the *gross* activity of the sun but on *individual flares* and therefore again on the positions of the planets.[15] Piccardi, in a series of investigations that covered more than thirty years found variations in the rate of standardized chemical reactions that could not be explained by laboratory or meteorological conditions. He and other workers in the field are inclined to believe 'that the phenomena observed are primarily related to changes of the structure of water used in the experiments'.[16] The chemical bond

[14] J. H. Nelson, *RCA Review*, Vol. 12 (1951), pp. 26ff.; *Electrical Engineering*, Vol. 71 (1952), pp. 421ff. Many of the scientific studies that are relevant for our case are described and indexed in Lyall Watson, *Supernature*, London 1973. Most of these studies have been neglected (without criticism) by orthodox scientific opinion.

[15] This was found by H. S. Burr. Reference in Watson, *op. cit.*

[16] S. W. Tromp, 'Possible Effects of Extra-Terrestrial Stimuli on Colloidal Systems and Living Organisms', *Proc. 5th Intern. Biometeorolog. Congress, Nordwijk 1972*, Tromp and Bouma (eds.), p. 243. The article contains a survey of the work initiated by Piccardi who started long range studies on the causes of certain non-reproducible physico-chemical processes in water. Some of the causes were related to solar eruptions, others to lunar parameters. Reference to such extra terrestrial stimuli is rare among environmental scientists and the corresponding problems are 'often forgotten or neglected' (p. 239). However, 'despite a certain resistance experienced among orthodox scientists, a clear breakthrough can be observed in recent years amongst the younger research workers' (p. 245). There are special research centres such as the *Biometeorological Research Center* in Leiden and the *Stanford Research Center* in Menlo Park, California which study what once was called the influence of the heavens upon the earth and have found correlations between organic and unorganic processes and lunar, solar, planetary parameters. Tromp's article contains a survey and a large bibliography. The *Biometeorological Research Center* issues periodic lists of publications (monographs, reports, publications in scientific journals). Part of the work done at the *Stanford Research Institute* and related institutions is reported in (ed.) John Mitchell *Psychic Exploration, A Challenge for Science*, New York 1974.

in water is about one tenth of the strength of average chemical bonds so that water is 'sensitive to extremely delicate influences and is capable of adapting itself to the most varying circumstances to a degree attained by no other liquid.'[17] It is quite possible that solar flares have to be included among these 'varying circumstances'[18] which would again lead to a dependence on planetary positions. Considering the role which water and organic colloids[19] play in life we may conjecture that 'it is by means of water and the aqueous system that the external forces are able to react on living organisms'.[20]

Just how sensitive organisms are has been shown in a series of papers by F. R. Brown. Oysters open and close their shells in accordance with the tides. They continue their activity when brought inland, in a dark container. Eventually they adapt their rhythm to the new location which means that they sense the very weak tides in an inland laboratory tank.[21] Brown also studied the metabolism of tubers and found a lunar period though the potatoes were kept at constant temperature, pressure, humidity, illumination: man's ability to keep conditions constant is smaller than the ability of a potato to pick up lunar rhythms[22] and Professor Bok's assertion that 'the walls of the delivery room shield us effectively from many known radiations' turns out to be just another case of a firm conviction based on ignorance.

The 'Statement' makes much of the fact that 'astrology was part and parcel of (the) magical world view' and the second article that is attached to it offers a 'final disproof' by showing that 'astrology arose from magic'. Where did the learned gentlemen get *this* information? As far as one can see there is not a single anthropologist among them and I am rather doubtful whether anyone is familiar with the more recent results of this discipline. What they do know are some *older* views from what one might call the 'Ptolemaic' period of anthropology when post-17th century Western man was supposed to be the sole possessor of sound knowledge, when field studies, archaeology and a more detailed examination of myth had not yet led to the discovery of the surprising knowledge possessed by ancient man as well as by modern 'Primitives' and when it was assumed

[17] G. Piccardi, *The Chemical Basis of Medical Climatology*, Springfield, Illinois 1962.

[18] Cf. G. R. M. Verfaillie, *Intern. Journ. Biometeorol.*, Vol. 13 (1969), pp. 113ff.

[19] Tromp, *loc. cit.*

[20] Piccardi, *loc. cit.*

[21] *Am. Journ. Physiol.*, Vol. 178 (1954), pp. 510ff.

[22] *Biol. Bull.*, Vol. 112 (1957), p. 285. The effect could also be due to synchronicity – cf. C. G. Jung, 'Synchronicity: An Acausal Connecting Principle', in *The Collected Works of C. G. Jung*, Vol. 8, London 1960, pp. 419ff.

that history consisted in a simple progression from more primitive to less primitive views. We see: the judgement of the '186 leading scientists' rests on an antediluvian anthropology, on ignorance of more recent results in their own fields (astronomy, biology, and the connection between the two) as well as on a failure to perceive the implications of results they do know. It shows the extent to which scientists are prepared to assert their authority even in areas in which they have no knowledge whatsoever.

There are many minor mistakes. 'Astrology', it is said 'was dealt a serious death blow' when Copernicus replaced the Ptolemaic system. Note the wonderful language: does the learned writer believe in the existence of 'death blows' that are not 'serious'? And as regards the content we can only say that the very opposite was true. Kepler, one of the foremost Copernicans used the new discoveries to improve astrology, he found new evidence for it, and he defended it against opponents.[23] There is a criticism of the dictum that the stars incline, but do not compel. The criticism overlooks that modern hereditary theory (for example) works with inclinations throughout. Some specific assertions that are part of astrology are criticized by quoting evidence that contradicts them; but every moderately interesting theory is always in conflict with numerous experimental results. Here astrology is similar to highly respected scientific research programmes. There is a longish quotation from a statement by psychologists. It says: 'Psychologists find no evidence that astrology is of any value whatsoever as an indicator of past, present, or future trends of one's personal life . . .'. Considering that astronomers and biologists have not found evidence *that is already published, and by researchers in their own fields*, this can hardly count as an argument. 'By offering the public the horoscope as a substitute for honest and sustained thinking, astrologers have been guilty of playing upon the human tendency to take easy rather than difficult paths' – but what about psychoanalysis, what about the reliance upon psychological tests which long ago have become a substitute for 'honest and sustained thinking' in the evaluation of people of all ages?[24] And as regards the magical origin of astrology one need only remark that science once was very closely connected with magic and must be rejected if astrology must be rejected on these grounds.

[23] Cf. Norbert Herz, *Keplers Astrologie*, Vienna 1895, as well as the relevant passages from Kepler's collected works. Kepler objects to tropical astrology, retains sidereal astrology, but only for mass phenomena such as wars, plagues etc.

[24] The objection from free will is not new; it was raised by the Church fathers. So was the twin objection.

The remarks should not be interpreted as an attempt to defend astrology *as it is practiced now* by the great majority of astrologists. Modern astrology is in many respects similar to early mediaeval astronomy: it inherited interesting and profound ideas, but it distorted them, and replaced them by caricatures more adapted to the limited understanding of its practitioners.[25] The caricatures are not used for research; there is no attempt to proceed into new domains and to enlarge our knowledge of extra-terrestrial influences; they simply serve as a reservoir of naive rules and phrases suited to impress the ignorant. Yet this is not the objection that is raised by our scientists. They do not criticize the air of stagnation that has been permitted to obscure the basic assumptions of astrology, they criticize these basic assumptions themselves and in the process turn their own subjects into caricatures. It is interesting to see how closely both parties approach each other in ignorance, conceit and the wish for easy power over minds.[26]

7. Laymen can and must supervise Science

These examples, which are not at all atypical,[27] show that it would not only be foolish *but downright irresponsible* to accept the judgement of scientists and physicians without further examination. If the matter is important, either to a small group or to society as a whole, *then this judgement must be subjected to the most painstaking scrutiny.* Duly elected committees of laymen must examine whether the theory of evolution is really as well established as biologists want us to believe, whether being established in their sense settles the matter, and whether it should replace other views in schools. They must examine the safety of nuclear reactors in each individual case and must be given access to *all* the relevant information. They must examine whether scientific medicine deserves the unique position of theoretical authority, access to funds, privileges of mutilation it enjoys today or whether non-scientific methods of healing are not frequently superior and they must encourage relevant comparisons: traditions of tribal medicine must be revived and practiced by those who prefer them partly because it is their wish, partly because we thus obtain some information about the efficiency of science (cf. also the remarks in Section 9 below). The committees must also examine whether

[25] On astrology see *AM* p. 100n.
[26] Cf. *AM* p. 208n.
[27] Further examples are given in *AM*.

peoples' minds are properly judged by psychological tests, what is to be said about prison reforms – and so on and so forth. In all cases the last word will not be that of the experts, but that of the people immediately concerned.[28]

That the errors of specialists can be discovered by ordinary people provided they are prepared to 'do some hard work' is the basic assumption of any trial by jury. The law demands that experts be cross-examined and that their testimony be subjected to the judgement of a jury. In making this demand it assumes that experts are human after all, that they make mistakes, even right in the centre of their specialty, that they try to cover up any source of uncertainty that might reduce the credibility of their ideas, that their expertise is not as inaccessible as they often insinuate. And it also assumes that a layman can acquire the knowledge necessary for understanding their procedures and finding their mistakes.

[28] Scientists, educators, physicians must be supervised when engaged in *public* jobs; but they must also be watched most carefully when called upon to solve the *problems of an individual*, or a family. Everyone knows that plumbers, carpenters, electricians cannot always be trusted and that it is wise to keep an eye on them. One starts by comparing different firms, chooses the one making the best suggestions and supervises every step of their work. The same applies to the so-called 'higher' professions: an individual who engages a lawyer, consults a meteorologist, asks for a foundation report on his house cannot take things for granted or he will find himself with a large bill and problems even greater than those for whose solution he called in the expert. All this is pretty well known. But there are some professions which still seem to be exempt from doubt. Many people trust a physician or an educator as they would have trusted a priest in earlier times. But doctors give incorrect diagnoses, prescribe harmful drugs, cut, X-ray, mutilate at the slightest provocation partly because they are incompetent, partly because they don't care and have so far been able to get away with murder, partly because the basic ideology of the medical profession which was formed in the aftermath of the scientific revolution can deal only with certain restricted aspects of the human organism but still tries to cover everything by the same method. Indeed, so large has the scandal of malpractice become that the physicians themselves are now advising their patients not to be content with a single diagnosis but to shop around and to supervise their treatment. Of course, second opinions should not be restricted to the medical profession for the problem may not be the incompetence of a single doctor, or of a group of doctors, the problem may be the *incompetence of scientific medicine as a whole*. Thus every patient must be the supervisor of his treatment just as every group of people and every tradition must be allowed to judge the projects which the government wants to carry out in their midst and must be able to reject those projects it does not regard as adequate.

In the case of educators the situation is still worse. For while it is possible to determine whether a *physical* treatment has been successful we have no ready means to determine the success of a mental treatment, of a so-called education. Reading, writing, arithmetic and knowledge of basic facts can be judged. But what shall we think of a training that turns people into second-hand existentialists or philosophers of science? What shall we think of the idiocies propagated by our sociologists and the atrocities regarded as 'critical productions' by our artists? They can palm off their ideas on us with impunity unless pupils start checking out their teachers just as patients have started checking out their doctors: the advice in all cases is to *use experts*, but never to *trust them* and certainly never to *rely on them* entirely.

This assumption is confirmed in trial after trial. Conceited and intimidating scholars, covered with honorary degrees, university chairs, presidencies of scientific societies are tripped up by a lawyer who has the talent to look through the most impressive piece of jargon and to expose the uncertainty, indefiniteness, the monumental ignorance behind the most dazzling display of omniscience: *science is not beyond the reach of the natural shrewdness of the human race.* I suggest that this shrewdness be applied to all important social matters which are now in the hands of experts.

8. Arguments from Methodology do not Establish the Excellence of Science

The considerations presented so far may be criticized by admitting that science, being a product of human effort has its *faults* but by adding that it is still *better* than alternative ways of acquiring knowledge. Science is superior for two reasons: it uses the correct *method* for getting results; and there are many *results* to prove the excellence of the method. Let us take a closer look at these reasons.

The answer to the first reason is simple: there is no 'scientific method'; there is no single procedure, or set of rules that underlies every piece of research and guarantees that it is 'scientific' and, therefore, trustworthy. Every project, every theory, every procedure has to be judged on its own merits and by standards adapted to the processes with which it deals. The idea of a universal and stable *method* that is an unchanging measure of adequacy and even the idea of a universal and stable *rationality* is as unrealistic as the idea of a universal and stable measuring instrument that measures any magnitude, no matter what the circumstances. Scientists revise their standards, their procedures, their criteria of rationality as they move along and enter new domains of research just as they revise and perhaps entirely replace their theories and their instruments as they move along and enter new domains of research. The main argument for this answer is historical: there is not a single rule, however plausible and however firmly grounded in logic and general philosophy that is not violated at some time or other. Such violations are not accidental events, they are not avoidable results of ignorance and inattention. Given the conditions in which they occurred they were necessary for progress, or for any other feature one might find desirable. Indeed, one of the most striking features of recent discussion in the history and philosophy of

science is the realization that events such as the invention of atomism in antiquity, the Copernican Revolution, the rise of modern atomism (Dalton; kinetic theory; dispersion theory; stereochemistry; quantum theory), the gradual emergence of the wave theory of light occurred only because some thinkers either *decided* not to be bound by certain 'obvious' rules, or because they *unwittingly broke* them. Conversely, we can show that most of the rules which are today defended by scientists and philosophers of science as constituting a uniform 'scientific method' are either useless – they do not produce the results they are supposed to produce – or debilitating. Of course, we may one day find a rule that helps us through all difficulties just as we may one day find a theory that can explain everything in our world. Such a development is not likely, one might almost be inclined to say that it is logically impossible, but I would still not want to exclude it. The point is that the development *has not yet started*: *today* we have to do science without being able to rely on any well defined and stable 'scientific method'.

The remarks made so far do not mean that research is arbitrary and unguided. There are standards, but they come from the research process itself, not from abstract views of rationality. It needs ingenuity, tact, knowledge of details to come to an informed judgement of existing standards and to invent new ones just as it needs ingenuity, tact, knowledge of details to come to an informed judgement of existing theories and to invent new ones. More of this in Section 3 of Part One and Section 3 of Chapter 4 of Part Three.

There are writers who agree with the account given so far and still insist on a special treatment for science. Polányi, Kuhn and others object to the idea that science must conform to external standards and insist as I do that standards are developed and examined by the very same process of research they are supposed to judge. This process, they say, is a most delicate machinery. It has its own Reason and determines its own Rationality. And therefore, so they add, it must be left undisturbed. Scientists will succeed only if they are entirely research oriented, if they are allowed to pursue only those problems they regard as important and to use only procedures that seem efficient to them.

This ingenious defence of financial support without corresponding obligations cannot be maintained. To start with, research is not always successful and often produces monsters. Small mistakes, involving restricted areas, may perhaps be corrected from the inside, comprehensive mistakes involving the 'basic ideology' of the field can be and often were revealed only by outsiders or by scientists with an unusual personal

history. Making use of new ideas these outsiders corrected the mistakes and so changed research in a fundamental way. Now what counts and what does not count as a mistake depends on the tradition that does the judging: for an analytical tradition (say, in medicine) the important thing is to find basic elements and to show how everything is built up from them. Lack of immediate success is a sign of the complexity of the problem and the need for more and more efficient research *of the same kind*. For a holistic tradition the important thing is to find large scale connections. Lack of immediate success of the analytic tradition is now a sign of its (partial) inadequacy and new research strategies may be suggested (this, incidentally, is roughly the situation in certain parts of cancer research). In the beginning the suggestions will be regarded as unwanted interference just as the mixing of astronomical and physical arguments was regarded as unwanted interference by the Aristotelian physicists of the 16th and 17th centuries. Which leads to a further criticism of the Kuhn-Polányi view: it assumes that the distinctions and separations implicit in a certain historical stage are unobjectionable and have to be maintained. But different research programmes were often united, or one subsumed under the other with a resulting change in competences. There is no reason why the research programme *science* should not be subsumed under the research programme *free society* and competences changed and redefined accordingly. The change is needed – the possibilities of freedom will not be exhausted without it – there is nothing inherent in science (except the wish of scientists to do their own thing at other people's expense) that forbids it; many scientific developments, though on a smaller scale, have been of exactly the same kind and, besides, an independent science has long ago been replaced by the *business* science which lives off society and strengthens its totalitarian tendencies. This disposes of the Polányi-Kuhn objection.

9. Nor is Science Preferable because of its Results

According to the second reason science deserves a special position because of its *results*.

This is an argument only if it can be shown (a) that no other view has ever produced anything comparable and (b) that the results of science are autonomous, they do not owe anything to non-scientific agencies. Neither assumption survives close scrutiny.

It is true that science has made marvellous contributions to our understanding of the world and that this understanding has led to even more marvellous practical achievements. It is also true that most rivals of science have by now either disappeared, or have been changed so that a conflict with science (and therefore the possibility of results that differ from the results of science) no longer arises: religions have been 'demythologized' with the explicit purpose of making them acceptable to a scientific age, myths have been 'interpreted' in a manner that removed their ontological implications. Some features of this development are not at all surprising. Even in a fair competition one ideology often assembles successes and overtakes its rivals. This does not mean that the beaten rivals are without merit and that they have ceased to be capable of making a contribution to our knowledge, it only means that they have temporarily run out of steam. They may return and cause the defeat of their defeaters. The philosophy of atomism is an excellent example. It was introduced (in the West) in antiquity with the purpose of 'saving' macrophenomena such as the phenomenon of motion. It was overtaken by the dynamically more sophisticated philosophy of the Aristotelians, returned with the scientific revolution, was pushed back with the development of continuity theories, returned again late in the 19th century and was again restricted by complementarity. Or take the idea of the motion of the earth. It arose in antiquity, was defeated by the powerful arguments of the Aristotelians, regarded as an 'incredibly ridiculous' view by Ptolemy, and yet staged a triumphant comeback in the 17th century. What is true of theories is true of methods: knowledge was founded on speculation and logic, then Aristotle introduced a more empirical procedure which was replaced by the more mathematical methods of Descartes and Galileo which in turn was combined with a fairly radical empiricism by the members of the Copenhagen school. The lesson to be drawn from this historical sketch is that a temporary setback for an ideology (which is a bunch of theories combined with a method and a more general philosophical point of view) must not be taken as a reason for eliminating it.

Yet this is precisely what happened to older forms of science and to non-scientific points of view after the scientific revolution: they were eliminated, first from science itself, then from society until we arrive at the present situation where their survival is endangered not only by the general prejudice in favour of science, but by institutional means as well: science has now become part of the basic fabric of democracy, as we have seen. In these circumstances, is it surprising that science reigns supreme

and is the only ideology known to have worthwhile results? It reigns supreme because some *past successes* have led to institutional measures (education; role of experts; role of power groups such as the AMA) that prevent a comeback of the rivals. Briefly, but not incorrectly: *today science prevails not because of its comparative merits, but because the show has been rigged in its favour.*

There is another element involved in this rigging mechanism, and we must not overlook it. I said above that ideologies may fall behind even in a fair competition. In the 16th and 17th centuries there was a fair competition (more or less) between ancient Western science and philosophy and the new scientific philosophy; there was never any fair competition between this entire complex of ideas and the myths, religions, procedures of non-Western societies. These myths, these religions, these procedures have disappeared or deteriorated not because science was better, but because *the apostles of science were the more determined conquerors*, because they *materially suppressed* the bearers of alternative cultures. There was no research. There was no 'objective' comparison of methods and achievements. There was colonization and suppression of the views of the tribes and nations colonized. These views were replaced, first, by the religion of brotherly love, and then by the religion of science. A few scientists studied tribal ideologies, but being prejudiced and insufficiently prepared they were unable to find any evidence of superiority or even of equality (not that they would have recognized such evidence had they found it). Again the superiority of science is the result not of research, or argument, it is the result of political, institutional, and even military pressures.

To see what happens when such pressures are removed or used against science we need only take a look at the history of traditional medicine in China.

China was one of the few countries that escaped Western intellectual domination down to the 19th century. Early in the 20th century a new generation, tired of the old traditions and the restrictions implicit in them and impressed by the material and intellectual superiority of the West imported science. Science soon pushed aside all traditional elements. Herbal medicine, acupuncture, moxibustion, the yin/yang duality, the theory of the chi were ridiculed and removed from schools and hospitals, Western medicine was regarded as the only sensible procedure. This was the attitude up to about 1954. Then the party, realizing the need for a political supervision of scientists ordered traditional medicine back into hospitals and universities. The order restored the free competition

between science and traditional medicine. One now discovered that traditional medicine has methods of diagnosis and therapy that are superior to those of Western scientific medicine. Similar discoveries were made by those who compared tribal medicines with science. The lesson to be learned is that *non-scientific ideologies, practices, theories, traditions can become powerful rivals and can reveal major shortcomings of science if only they are given a fair chance to compete.* It is the task of the institutions of a free society to give them such a fair chance.[29] The excellence of science, however, can be asserted only *after* numerous comparisons with alternative points of view.

More recent research in anthropology, archaeology (and here especially in the flourishing subject of archaeoastronomy,[30] history of science, parapsychology[31] has shown that our ancestors and our 'primitive' contemporaries had highly developed cosmologies, medical theories, biological doctrines which are often more adequate and have better results than their Western competitors[32] and describe phenomena not accessible

[29] In the 15th, 16th and 17th centuries artisans emphasized the conflict between their concrete knowledge and the abstract knowledge of the schools. 'Through practice' writes Bernard Palissy (quoted from P. Rossi, *Philosophy, Technology and the Arts in the Early Modern Era*, New York 1970, p. 2 – the book contains many similar quotations and a thorough analysis of the situation from which they arose) 'I prove that the theories of many philosophers, even the most ancient and famous ones, are erroneous in many points.' Through practice Paracelsus showed that the medical knowledge of herbalists, country doctors, witches was superior to the knowledge of the scientific medicine of the time. Through practice navigators disproved the cosmological and climatological notions of the schools. It is interesting to see that the situation has not much changed. 'Through practice' acupuncturists and herbalists show that they can diagnose and heal illnesses whose effects scientific medicine recognizes but which it neither understands nor heals. 'Through practice' Thor Heyerdahl refuted scientific opinions about possibilities of navigation and seaworthiness of ships (cf. *The Ra Expeditions*, New York 1972, pp. 120, 155, 156, 122, 175, 261, 307 etc. concerning papyrus boats). 'Through practice' media produced effects which did not fit into the scientific world view and were ridiculed until a few fearless scientists proceded to examine them and proved their reality. [Even staid scientific organizations such as the American Association for the Advancement of Science now take them seriously and give them institutional recognition (incorporation of organizations dedicated to the study of parapsychological phenomena).] The rise of modern science has not eliminated the tension between extrascientific practice and school opinion, it has only given it a different content. School opinion is no longer Aristotle, it is not even restricted to a specific author, it is a body of doctrines, methods and experimental procedures that claims to possess the only reliable method for finding truth – and is constantly proven wrong in this claim (though the screening procedures mentioned in the text above make it difficult to discover major failures).

[30] For this and related fields cf. R. R. Hodson, ed., *The Place of Astronomy in the Ancient World*, Oxford 1974.

[31] For a survey cf. E. Mitchell, *op. cit.*

[32] Cf. the material in Chapters 1 and 2 of Lévi-Strauss, *The Savage Mind*. Physicians working with tribal healers have often admired their comprehension, knowledge and their quick understanding of new methods of healing (X-rays, for example).

to an 'objective' laboratory approach.[33] Nor is it surprising to find that ancient man had views worth considering. Stone Age man was already the fully developed *homo sapiens*, he was faced by tremendous problems which he solved with great ingenuity. Science is always praised because of its achievements. So let us not forget that the inventors of myth invented fire, and the means of keeping it. They domesticated animals, bred new types of plants, kept types separate to an extent that exceeds what is possible in today's scientific agriculture.[34] They invented rotation of fields and developed an art that can compare with the best creations of Western man. Not being hampered by specialization they found large scale connections between man and man and man and nature and relied on them to improve their science and their societies: the best ecological philosophy is found in the Stone Age. They crossed the oceans in vessels that were more seaworthy than modern vessels of comparable size and demonstrated a knowledge of navigation and the properties of materials that conflicts with scientific ideas but is, on trial, found to be correct.[35] They were aware of the role of change and their fundamental laws took this into account. It is only quite recently that science has returned to the Stone Age view of change after a long and dogmatic insistence on 'eternal laws of nature' that started with the 'rationalism' of the Presocratics and culminated towards the end of the last century. Moreover, these were not instinctive discoveries, they were the result of thought and speculation. 'There is abundant data which suggests not only that hunter-gatherers have adequate supplies of food but also that they enjoy quantities of leisure time, much more in fact than do modern industrial or farm workers, or even professors of archaeology.' There was abundant opportunity for 'pure thought'.[36] It is no good insisting that the discoveries of Stone Age man were due to an instinctive use of the correct scientific method. If they were, and if they led to correct results, then why did later scientists so often come to different conclusions? And, besides, there is no 'scientific method', as we have seen. Thus if science is praised because of its achievements, then myth must be praised a hundred times more fervently because *its* achievements were incomparably greater. The inventors of myth *started* culture while rationalists and scientists just

[33] Cf. Chapter 4 of *AM*.

[34] E. Anderson, *Plants, Man and Life*, London 1954.

[35] Cf. *Kon Tiki* and *The Ra Expeditions* by Thor Heyerdahl, esp. pp. 120, 122, 153, 132, 175, 206, 218f., 259 of the latter on the seaworthiness of papyrus and the proper construction of rafts.

[36] L. R. Binford and S. R. Binford, *New Perspectives in Archaeology*, Chicago 1968, p. 328. Cf. also the work of Marshall Sahlins.

changed it, and not always for the better.[37]

Assumption (b) can be refuted with equal ease: there is not a single important scientific idea that was not stolen from elsewhere. The Copernican Revolution is an excellent example. Where did Copernicus get his ideas? From ancient authorities, as he says himself. Who are the authorities that played a role in his thinking? Philolaos, among others, and Philolaos was a muddleheaded Pythagorean. How did Copernicus proceed when trying to make the ideas of Philolaos part of the astronomy of his time? By violating reasonable methodological rules. 'There is no limit to my astonishment' writes Galileo[38] 'when I reflect that Aristarchus and Copernicus were able to make reason so conquer sense that, in defiance of the latter, the former became mistress of their belief.' 'Sense', here, refers to the experience which Aristotle and others had used to show that the earth must be at rest. The 'reason' which Copernicus opposes to such arguments is the very mystical reason of Philolaos (and of the Hermeticists) combined with an equally mystical faith in the fundamental character of circular motion. Modern astronomy and modern dynamics could not have advanced without this unscientific use of antediluvian ideas.

While astronomy profited from Pythagoreanism and from the Platonic love for circles, medicine profited from herbalism, from the psychology, the metaphysics, the physiology of witches, midwives, cunning men, wandering druggists. It is well known that 16th and 17th century medical science, while theoretically hypertrophic, was quite helpless in the face of disease (and stayed that way for quite some time after the 'scientific revolution'). Innovators like Paracelsus fell back on earlier ideas and improved medicine. Everywhere science is enriched by unscientific methods and unscientific results while procedures which have often been regarded as essential parts of science are quietly suspended or circumvented.

[37] In Hesiod, who preserved earlier stages of thought, laws *come into existence* (rule of Zeus) and are the result of a *balance of opposing forces* (titans in fetters). They are the result of a dynamic equilibrium. In the 19th century laws were regarded as eternal and absolute, i.e. not due to a balance of mutually restricting entities. Hesiod's cosmology is far ahead of 19th century science.

[38] *Dialogue Concerning the Two Chief World Systems*, tr. Drake, Berkeley and Los Angeles 1954, p. 328. For details cf. the chapters on Galileo in *AM*.

10. Science is one Ideology among many and should be separated from the State just as Religion is now separated from the State

I started by stipulating that a free society is a society in which all traditions have equal rights and equal access to the centres of power.

This led to the objection that equal rights can be guaranteed only if the basic structure of society is 'objective', not influenced by undue pressures from any one of the traditions. Hence, rationalism will be more important than other traditions.

Now if rationalism and the accompanying views are not yet in existence or have no power then they cannot influence society as planned. Yet life is not chaos under such circumstances. There are wars, there is power-play, there are open debates between different cultures. The tradition of objectivity may therefore be introduced in a variety of ways. Assume it is introduced by an open debate – then, why should we change the form of debate at this point? Intellectuals say because of the 'objectivity' of their procedure – a pitiful lack of perspective, as we have seen. There is no reason to stick to reason even if it was reached by an open debate. There is even less reason to stick to it if it was imposed by force. This removes the objection.

The second objection is that though traditions may perhaps claim equal *rights* they do not produce equal *results*. This may be discovered by an open debate. The implication is that the excellence of science was established long ago – so why the fuss?

There are two replies to this objection. First that the comparative excellence of science has been anything but established. There are of course many *rumours* to that effect, but the *arguments* that are offered dissolve on closer inspection. Science does not excel because of its method for there is no method; and it does not excel because of its results: we know what science *does*, we have not the faintest idea whether other traditions could not do *much better*. So, we must find out.

To find out we must let all traditions freely develop side by side as is at any rate required by the basic stipulation of a free society. It is quite possible that an open debate about this development will find that some traditions have less to offer than others. This does not mean that they will be abolished – they will survive and keep their rights as long as there are people interested in them – it only means that for the time being their (material, intellectual, emotional etc.) products play a relatively small role. But what pleases once does not please always; and what aids tradi-

tions in one period does not aid them in others. The open debate and with it the examination of the favoured traditions will therefore continue: society is never identified with one particular tradition, and state and traditions are always kept separate.

The separation of state and science (rationalism) which is an essential part of this general separation of state and traditions cannot be introduced by a single political act and it should not be introduced in this way: many people have not yet reached the maturity necessary for living in a free society (this applies especially to scientists and other rationalists). People in a free society must decide about very basic issues, they must know how to assemble the necessary information, they must understand the purpose of traditions different from their own and the roles they play in the lives of their members. The maturity I am speaking about is not an intellectual virtue, it is a sensitivity that can only be acquired by frequent contacts with different points of view. It can't be taught in schools and it is vain to expect that 'social studies' will create the wisdom we need. But it can be acquired by participating in citizens' initiatives. This is why the *slow* progress, the *slow* erosion of the authority of science and of other pushy institutions that is produced by these initiatives is to be preferred to more radical measures: citizen initiatives are the best and only school for free citizens we now have.

11. Origin of the Ideas of this Essay

The problem of knowledge and education in a free society first struck me during my tenure of a state fellowship at the Weimar Institut zur Methodologischen Erneuerung des Deutschen Theaters (1946) which was a continuation of the Deutsches Theater Moskau under the directorship of Maxim Vallentin. Staff and Students of the Institut periodically visited theatres in Eastern Germany. A special train brought us from city to city. We arrived, dined, talked to the actors, watched two or three plays. After each performance the public was asked to remain seated while we started a discussion of what we had just seen. There were classical plays, but there were also new plays which tried to analyse recent events. Most of the time they dealt with the work of the resistance in Nazi Germany. They were indistinguishable from earlier Nazi plays eulogizing the activity of the Nazi underground in democratic countries. In both cases there were ideological speeches, outbursts of sincerity and dangerous situations in the cops and robbers tradition. This puzzled me and I commented on it

in the debates: how is a play to be structured so that one recognizes it as presenting the 'good side'? What has to be added to the action to make the struggle of the resistance fighter appear morally superior to the struggle of an illegal Nazi in Austria before 1938? It is not sufficient to give him the 'right slogans' for then we take his superiority for granted, we do not show wherein it consists. Nor can his nobility, his 'humanity' be the distinguishing mark; every movement has scoundrels as well as noble people among its followers. A playwright may of course decide that sophistication is luxury in moral battles and give a black-white account. He may lead his followers to victory but at the expense of turning them into barbarians. What, then, is the solution? At the time I opted for Eisenstein and ruthless propaganda for the 'right cause'. I don't know whether this was because of any deep conviction of mine, or because I was carried along by events, or because of the magnificent art of Eisenstein. Today I would say that the choice must be left to the audience. The playwright presents characters and tells a story. If he errs it should be on the side of sympathy for his scoundrels, for circumstances and suffering play as large a role in the creation of evil and evil intentions as do those intentions themselves, and the general tendency is to emphasize the latter. The playwright (and his colleague, the teacher) must not try to anticipate the decision of the audience (of the pupils) or replace it by a decision of his own if they should turn out to be incapable of making up their own minds. *Under no circumstances must he try to be a 'moral force'.* A moral force, whether for good or for evil, turns people into slaves and slavery, even slavery in the service of The Good, or of God Himself is the most abject condition of all. This is how I see the situation today. However, it took me a long time before I arrived at this view.

After a year in Weimar I wanted to add the sciences and the humanities to the arts, and the theatre. I left Weimar and became a student (history, auxiliary sciences) at the famous *Institut für Osterreichische Geschichtforschung* which is part of the University of Vienna. Later on I added physics and astronomy and so finally returned to the subject I had decided to pursue before the interruptions of World War Two.

There were the following 'influences'.

(1) The *Kraft Circle.* Many of us science and engineering students were interested in the foundations of science and in broader philosophical problems. We visited philosophy lectures. The lectures bored us and we were soon thrown out because we asked questions and made sarcastic remarks. I still remember Professor Heintel advising me with raised arms: 'Herr Feyerabend, entweder sie halten das Maul, oder sie verlassen den

Vorlesungssaal!' We did not give up and founded a philosophy club of our own. Victor Kraft, one of my teachers, became our chairman. The members of the club were mostly students,[39] but there were also visits by faculty members and foreign dignitaries. Juhos, Heintel, Hollitscher, von Wright, Anscombe, Wittgenstein came to our meetings and debated with us. Wittgenstein who took a long time to make up his mind and then appeared over an hour late gave a spirited performance and seemed to prefer our disrespectful attitude to the fawning admiration he encountered elsewhere. Our discussions started in 1949 and proceeded with interruptions up to 1952 (or 53). Almost the whole of my thesis was presented and analysed at the meetings and some of my early papers are a direct outcome of these debates.

(2) The Kraft Circle was part of an organization called the *Austrian College Society.* The Society had been founded in 1945 by Austrian resistance fighters[40] to provide a forum for the exchange of scholars and ideas and so to prepare the political unification of Europe. There were seminars, like the Kraft Circle, during the academic year and international meetings during the summer. The meetings took place (and still take place) in Alpbach, a small mountain village in Tirol. Here I met outstanding scholars, artists, politicians and I owe my academic career to the friendly help of some of them. I also began suspecting that what counts in a public debate are not arguments but certain ways of presenting one's case. To test the suspicion I intervened in the debates defending absurd views with great assurance. I was consumed by fear – after all, I was just a student surrounded by bigshots – but having once attended an acting school I proved the case to my own satisfaction. The difficulties of *scientific* rationality were made very clear by

(3) *Felix Ehrenhaft* who arrived in Vienna in 1947. We, the students of physics, mathematics, astronomy had heard a lot about him. We knew that he was an excellent experimenter and that his lectures were performances on a grand scale which his assistants had to prepare for hours in advance. We knew that he had taught theoretical physics which was as exceptional for an experimentalist then as it is now. We were also familiar

[39] Many of them have now become scientists or engineers. Johnny Sogon is Professor of Mathematics at the University of Illinois, Henrich Eichorn (who also signed the anti-astrological encyclical mentioned above) director of New Haven observatory, Goldberger – de Buda adviser to electronics firms while Erich Jantsch who met members of our circle at the astronomical observatory has become a guru of dissident or pseudo-dissident scientists, trying to use old traditions for new purposes.

[40] Otto Molden, brother of Fritz Molden of the Molden publishing house, was for many years the dynamic leader and organizer.

with the persistent rumours that denounced him as a charlatan. Regarding ourselves as defenders of the purity of physics we looked forward to exposing him in public. At any rate our curiosity was aroused – and we were not disappointed.

Ehrenhaft was a mountain of a man, full of vitality and unusual ideas. His lectures compared favourably (or unfavourably, depending on the point of view) with the more refined performances of his colleagues. 'Are you dumb? Are you stupid? Do you really agree with everything I say?' he shouted at us who had intended to expose him but sat in silent astonishment at his performance. The question was more than justified for there were large chunks to swallow. Relativity and quantum theory were rejected at once, and almost as a matter of course for being idle speculation. In this respect Ehrenhaft's attitude was very close to that of Stark and Lenard both of whom he mentioned more than once with approval. But he went further than they and criticized the foundations of classical physics as well. The first thing to be removed was the law of inertia: undisturbed objects instead of going in a straight line were supposed to move in a helix. Then came a sustained attack on the principles of electromagnetic theory and especially on the equation $\operatorname{div} B = 0$. Then new and surprising properties of light were demonstrated – and so on and so forth. Each demonstration was accompanied by a few gently ironical remarks on 'school physics' and the 'theoreticians' who built castles in the air without considering the experiments which Ehrenhaft devised and continued devising in all fields and which produced a plethora of inexplicable results.

We had soon an opportunity to witness the attitude of orthodox physicists. In 1949 Ehrenhaft came to Alpbach. In that year Popper conducted a seminar on philosophy, Rosenfeld and M. H. L. Pryce taught physics and philosophy of physics (mainly from Bohr's comments on Einstein which had then just appeared), Max Hartmann biology, Duncan Sandys talked on problems of British politics, Hayek on economics and so on. There was Hans Thirring, the senior theoretical physicist from Vienna who constantly tried to impress on us that there were more important things than science and who had taught theoretical physics to Feigl, Popper as well as the present author. His son Walter Thirring, now Professor of Theoretical Physics in Vienna was also present – a very distinguished audience and a very critical one.

Ehrenhaft came well prepared. He set up a few of his simple experiments in one of the country houses of Alpbach and invited everyone he could lay hands on to have a look. Every day from two to three in the

afternoon participants went by in an attitude of wonder and left the building (if they were theoretical physicists, that is) as if they had seen something obscene. Apart from these physical preparations Ehrenhaft also carried out, as was his habit, a beautiful piece of advertising. The day before his lecture he attended a fairly technical talk by von Hayek on 'The Sensory Order' (now available, in expanded form, as a book). During the discussion he rose, bewilderment and respect in his face, and started in a most innocent voice: 'Dear Professor Hayek. This was a marvellous, an admirable, a most learned lecture. I did not understand a single word . . .'. Next day his lecture had an overflow audience.

In this lecture Ehrenhaft gave a brief account of his discoveries adding general observations on the state of physics. 'Now gentlemen' he concluded triumphantly, turning to Rosenfeld and Pryce who sat in the front row – 'what can you say?' And he answered immediately. 'There is nothing at all you can say with all your fine theories. Sitzen muessen sie bleiben! Still muessen sie sein!'

The discussion, as was to be expected, was quite turbulent and it was continued for days with Thirring and Popper taking Ehrenhaft's side against Rosenfeld and Pryce. Confronted with the experiments the latter occasionally acted almost as some of Galileo's opponents must have acted when confronted with the telescope. They pointed out that no conclusions could be drawn from complex phenomena and that a detailed analysis was needed. In short, the phenomena were a *Dreckeffect* – a word that was heard quite frequently in the arguments. What was our attitude in the face of all this commotion?

None of us was prepared to give up theory or to deny its excellence. We founded a Club for the Salvation of Theoretical Physics and started discussing simple experiments. It turned out that the relation between theory and experiment was much more complex than is shown in textbooks and even in research papers. There are a few paradigmatic cases where the theory can be applied without major adjustments but the rest must be dealt with by occasionally rather doubtful approximations and auxiliary assumptions.[41] I find it quite interesting to remember how little effect all this had on us at the time. We continued to prefer abstractions as if the difficulties we had found had not been an expression of the nature of things but could be removed by some ingenious device, yet to be discovered. Only much later did Ehrenhaft's lesson sink in and our attitude at the time as well as the attitude of the entire profession provided me then with an excellent illustration of the nature of scientific rationality.

[41] *AM*, p. 63 on ad hoc approximations.

(4) *Philipp Frank* came to Alpbach a few years after Ehrenhaft. He undermined common ideas of rationality in a different way by showing that the arguments against Copernicus had been perfectly sound and in agreement with experience while Galileo's procedures were 'unscientific' when viewed from a modern standpoint. His observations fascinated me and I examined the matter further. Chapters 8 to 11 of *AM* are a late result of this study (I am a slow worker). Frank's work has been treated quite unfairly by philosophers like Putnam who prefer simplistic models to the analysis of complex historical events. Also his ideas are now commonplace. But it was he who announced them when almost everyone thought differently.

(5) In Vienna I became acquainted with some of the foremost Marxist intellectuals. This was the result of an ingenious PR job by Marxist students. They turned up – as did we – at all major discussions whether the subject was science, religion, politics, the theatre, or free love. They talked to those of us who used science to ridicule the rest – which was then my favourite occupation – and invited us to discussions of their own and introduced us to Marxist thinkers from all fields. I came to know Berthold Viertel, the director of the Burgtheater, Hanns Eisler, the composer and music theoretician and *Walter Hollitscher* who became a teacher and, later on, one of my best friends. When starting to discuss with Hollitscher I was a raving positivist, I favoured strict rules of research and had only a pitying smile for the three basic principles of dialectics which I read in Stalin's little pamphlet on dialectical and historical materialism. I was interested in the realist position, I had tried to read every book on realism I could lay hands on (including Külpe's excellent *Realisierung* and, of course, *Materialism and Empiriocriticism*) but I found that the arguments for realism worked only when the realist assumption had already been introduced. Külpe, for example, emphasized the distinction between impression and the thing the impression is about. The distinction gives us realism only if it characterizes real features of the world – which is the point at issue. Nor was I convinced by the remark that science is an essentially realistic enterprise. Why should science be chosen as an authority? And were there not positivistic interpretations of science? The so-called 'paradoxes' of positivism, however, which Lenin exposed with such consummate skill did not impress me at all. They arose only if the positivist and the realist mode of speech were mixed and exposed their difference. They did not show that realism was better though the fact that realism came with common speech gave the impression that it was.

Hollitscher never presented an argument that would lead, step by step, from positivism into realism and he would have regarded the attempt to produce such an argument as philosophical folly. He rather developed the realist position itself, illustrated it by examples from science and commonsense, showed how closely it was connected with scientific research and everyday action and so revealed its strength. It was of course always possible to turn a realistic procedure into a positivistic procedure by a judicious use of ad hoc hypotheses and ad hoc meaning changes and I did this frequently, and without shame (in the Kraft Circle we had developed such evasions into a fine art). Hollitscher did not raise semantic points, or points of method, as a critical rationalist might have done, he continued to discuss concrete cases until I felt rather foolish with my abstract objections. For I saw now how closely realism was connected with facts, procedures, principles I valued and that it *had helped to bring them about* while positivism merely *described* the results in a rather complicated way after they had been found: realism had fruits, positivism had none. This at least is how I would speak today, long *after* my realist conversion. At the time I became a realist not because I was convinced by any particular argument, but because the sum total of realism plus the arguments in favour of it plus the ease with which it could be applied to science and many other things I vaguely felt but could not lay a finger on[42] finally *looked better to me* than the sum total of positivism plus the arguments one could offer for it plus . . . etc. etc. The comparison and the final decision had much in common with the comparison of life in different countries (weather, character of people, melodiousness of language, food, laws, institutions, weather etc. etc.) and the final decision to take a job and to start life in one of them. Experiences such as these have played a decisive role in my attitude towards rationalism.

While I accepted realism I did not accept dialectics and historical materialism – my predilection for abstract arguments (another positivist hangover) was still too strong for that. Today Stalin's rules seem to me preferable by far to the complicated and epicycle-ridden standards of our modern friends of reason.

[42] I remember that Reichenbach's answer to Dingler's account of relativity played an important part: Dingler extrapolated from what could be achieved by simple mechanical operations (manufacture of a Euclidian plain surface, for example) while Reichenbach pointed out how the actual structure of the world would modify the results of these operations in the large. It is of course true that Reichenbach's account can be interpreted as a more efficient predictive machine and that it seemed impressive to me only because I did not slide into such an interpretation. Which shows to what extent the force of arguments depends on irrational changes of attitude.

From the very beginning of our discussion Hollitscher made it clear that he was a communist and that he would try to convince me of the intellectual and social advantages of dialectical and historical materialism. There was none of the mealy-mouthed 'I may be wrong, you may be right – but together we shall find the truth' talk with which 'critical' rationalists embroider their attempts at indoctrination but which they forget the moment their position is seriously endangered. Nor did Hollitscher use unfair emotional or intellectual pressures. Of course, he criticized my attitude and he still does but our personal relations have not suffered from my reluctance to follow him in every respect. This is why Walter Hollitscher is a teacher while Popper whom I also came to know quite well is a mere propagandist.

At some point of our acquaintance Hollitscher asked me whether I would like to become a production assistant of Brecht – apparently there was a position available and I was being considered for it. I declined. This, I think, was one of the biggest mistakes of my life. Enriching and changing knowledge, emotions, attitudes through the arts now seems to me a much more fruitful enterprise and also much more humane than the attempt to influence minds (and nothing else) by words (and nothing else). If today only about 10% of my talents are developed then this is due to a wrong decision at the age of 25.

(6) During a lecture (on Descartes) I gave at the Austrian College Society I met *Elizabeth Anscombe*, a powerful and, to some people, forbidding British philosopher who had come to Vienna to learn German for her translation of Wittgenstein's works. She gave me manuscripts of Wittgenstein's later writings and discussed them with me. The discussions extended over months and occasionally proceeded from morning over lunch until late into the evening. They had a profound influence upon me though it is not at all easy to specify particulars. On one occasion which I remember vividly Anscombe, by a series of skilful questions, made me see how our conception (and even our perceptions) of well-defined and apparently self-contained facts may depend on circumstances not apparent in them. There are entities such as physical objects which obey a 'conservation principle' in the sense that they retain their identity through a variety of manifestations and even when they are not present at all while other entities such as pains and after images are 'annihilated' with their disappearance. The conservation principles may change from one developmental stage of the human organism to another[43] and they

[43] Cf. *AM*, pp. 227ff.

may be different for different languages (cf. Whorff's 'covert classifications' as described in Chapter 17 of *AM*). I conjectured that such principles would play an important role in science, that they might change during revolutions and that deductive relations between pre-revolutionary and post-revolutionary theories might be broken off as a result. I explained this early version of incommensurability in Popper's seminar (1952) and to a small group of people in Anscombe's flat in Oxford (also in 1952 with Geach, von Wright and L. L. Hart present) but I was not able to arouse much enthusiasm on either occasion.[44] Wittgenstein's emphasis on the need for concrete research and his objections to abstract reasoning ('Look, don't think!') somewhat clashed with my own inclinations and the papers in which his influence is noticeable are therefore mixtures of concrete examples and sweeping principles.[45] Wittgenstein was prepared to take me on as a student in Cambridge but he died before I arrived in England. Popper became my supervisor instead.

(7) I had met *Popper* in Alpbach in 1948. I admired his freedom of manners, his cheek, his disrespectful attitude towards the German philosophers who gave the proceedings weight in more senses than one, his sense of humour (yes, the relatively unknown Karl Popper of 1948 was very different from the established Sir Karl of later years) and I also admired his ability to restate ponderous problems in simple and journalistic language. Here was a free mind, joyfully putting forth his ideas, unconcerned about the reaction of the 'professionals'. Things were different as regards these ideas themselves. The members of our Circle knew deductivism from Kraft who had developed it before Popper,[46] the falsificationist philosophy was taken for granted in the physics seminar of the conference under the chairmanship of Arthur March and so we did not understand what all the fuss was about. 'Philosophy must be in a desperate state' we said 'if trivialities such as these can count as major discoveries'. Popper himself did not seem to think too much of his philosophy of science at the time for when asked to send us a list of publications he included the *Open Society* but not the *Logic of Scientific Discovery*.

While in London I read Wittgenstein's *Philosophical Investigations* in

[44] For details cf. Part One, Section 7 of this volume.

[45] For details cf. my comments on these papers in *Der Wissenschaftstheoretische Realismus und die Autorität der Wissenschaften*, Vieweg Wiesbaden 1978.

[46] Cf. my review of Kraft's *Erkenntnislehre* in *BJPS*, Vol. 13 (1963), pp. 319ff. and esp. p. 321, second paragraph. Cf. also the references in Popper, *Logic of Scientific Discovery*.

detail. Being of a rather pedantic turn of mind I rewrote the book so that it looked more like a treatise with a continuous argument. Part of this treatise was translated by Anscombe into English and published as a review by *Phil. Rev.* in 1955. I also visited Popper's seminar at the LSE. Popper's ideas were similar to those of Wittgenstein but they were more abstract and anaemic. This did not deter me but increased my own tendencies to abstraction and dogmatism. At the end of my stay in London Popper invited me to become his assistant. I declined despite the fact that I was broke and did not know where my next meal was going to come from. My decision was not based on any clearly recognizable train of thought but I guess that having no fixed philosophy I preferred stumbling around in the world of ideas at my own speed to being guided by the ritual of a 'rational debate'. Two years later Popper, Schrödinger and my own big mouth got me a job in Bristol where I started lecturing on the philosophy of science.

(8) I had studied theatre, history, mathematics, physics and astronomy, I had never studied philosophy. The prospect of having to address a large audience of eager young people did not exactly fill my heart with joy. One week before the lectures started I sat down and wrote everything I knew on a piece of paper. It hardly filled a page. Agassi came up with some excellent advice: 'Look Paul' he said 'the first line, this is your first lecture; the second line, this is your second lecture – and so on.' I took his advice and fared rather well except that my lectures became a stale collection of wisecracks by Wittgenstein, Bohr, Popper, Dingler, Eddington and others. While in Bristol I continued my studies of the quantum theory. I found that important physical principles rested on methodological assumptions that are violated whenever physics advances: physics gets authority from ideas it propagates but never obeys in actual research, methodologists play the role of publicity agents whom physicists hire to praise their results but whom they would not permit access to the enterprise itself. That falsificationism is not a solution became very clear in discussions with David Bohm who gave a Hegelian account of the relation between theories, their evidence, and their successors.[47] The material of Chapter 3 of *AM* is the result of these discussions (I first published it in 1961).[48] Kuhn's remarks on the omnipresence of anomalies fitted these

[47] I have explained the Hegelianism of Bohm in the essay 'Against Method' which appeared in Vol. iv of the *Minnesota Studies for the Philosophy of Science* (1970).

[48] Popper once remarked (in a discussion at the Minnesota Center for the Philosophy of Science in the year 1962) that the example of Brownian motion is just another version of Duhem's example (conflict between specific laws such as Kepler's laws and general theories such as Newton's theory). But there is a most important difference. The deviations from

difficulties rather nicely[49] but I still tried to find general rules that would cover all cases[50] and non-scientific developments as well.[51] Two events made me realize the futility of such attempts. One was a discussion with Professor C. F. von Weizsäcker in Hamburg (1965) on the foundations of the quantum theory. Von Weizsäcker showed how quantum mechanics arose from concrete research while I complained, on general methodological grounds, that important alternatives had been omitted. The arguments supporting my complaint were quite good – they are the arguments summarized in Chapter 3 of *AM* – but it was suddenly clear to me that imposed without regard to circumstances they were a hindrance rather than a help: a person trying to solve a problem whether in science or elsewhere *must be given complete freedom* and cannot be restricted by any demands, norms, however plausible they may seem to the logician or the philosopher who has thought them out in the privacy of his study. Norms and demands must be checked by research, not by appeal to theories of rationality. In a lengthy article[52] I explained how Bohr had used this philosophy and how it differs from more abstract procedures. Thus Professor von Weizsäcker has prime responsibility for my change to 'anarchism' – though he was not at all pleased when I told him so in 1977.

(9) The second event that prompted me to move away from rationalism and to become suspicious of all intellectuals was quite different. To explain it, let me start with some more general observations. The way in which social problems, problems of energy distribution, ecology, education, care for the old and so on are 'solved' in our societies can be roughly described in the following way. A problem arises. Nothing is done about it. People get concerned. Politicians broadcast this concern. Experts are called in. They develop a plan or a variety of plans. Power-groups with experts of their own effect various modifications until a watered down version is accepted and realized. The role of experts in this process has gradually increased. Intellectuals have developed theories about the application of science to social problems. 'To get ideas' they ask other

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Kepler's laws are in principle observable ('in principle' here meaning 'given the known laws of nature') while the microscopic deviations from the second law of thermodynamics are not (measuring instruments are subjected to the same fluctuations as the things they are supposed to measure). Here we *cannot* do without an alternative theory.

[49] I read Kuhn's book in manuscript in 1960 and discussed it extensively with Kuhn.

[50] Cf. the account in 'Reply to Criticism', *Boston Studies*, Vol. ii, 1965.

[51] Cf. 'On the Improvement of the Sciences and the Arts and the Possible Identity of the Two' in *Boston Studies*, Vol. iii, 1967.

[52] 'On a Recent Critique of Complementarity', *Philosophy of Science* 1968/69 (two parts).

intellectuals, or politicians. Only rarely does it occur to them that it is not their business *but the business of those immediately concerned* to decide the matter. They simply take it for granted that their ideas and those of their colleagues are the only important ones and that people have to adapt to them. What has this situation got to do with me?

From 1958 on I was a Professor of Philosophy at the University of California in Berkeley. My function was to carry out the educational policies of the State of California which means I had to teach people what a small group of white intellectuals had decided was knowledge. I hardly ever thought about this function and I would not have taken it very seriously had I been informed. I told the students what I had learned, I arranged the material in a way that seemed plausible and interesting to me – and that was all I did. Of course, I had also some 'ideas of my own' – but these ideas moved in a fairly narrow domain (though some of my friends said even then that I was going batty).

In the years 1964ff. Mexicans, Blacks, Indians entered the university as a result of new educational policies. There they sat, partly curious, partly disdainful, partly simply confused hoping to get an 'education'. What an opportunity for a prophet in search of a following! What an opportunity, my rationalist friends told me, to contribute to the spreading of reason and the improvement of mankind! What a marvellous opportunity for a new wave of enlightenment! I felt very differently. For it dawned on me that the intricate arguments and the wonderful stories I had so far told to my more or less sophisticated audience might just be dreams, reflections of the conceit of a small group who had succeeded in enslaving everyone else with their ideas. Who was I to tell these people what and how to think? I did not know their problems though I knew they had many. I was not familiar with their interests, their feelings, their fears though I knew that they were eager to learn. Were the arid sophistications which philosophers had managed to accumulate over the ages and which liberals had surrounded with schmaltzy phrases to make them palatable the right thing to offer to people who had been robbed of their land, their culture, their dignity and who were now supposed to absorb patiently and then to repeat the anaemic ideas of the mouthpieces of their oh so human captors? They wanted to know, they wanted to learn, they wanted to understand the strange world around them – did they not deserve better nourishment? Their ancestors had developed cultures of their own, colourful languages, harmonious views of the relation between man and man and man and nature whose remnants are a living criticism of the tendencies of separation, analysis, self-centredness inherent in

Western thought. These cultures have important achievements in what is today called sociology, psychology, medicine, they express ideals of life and possibilities of human existence. Yet *they were never examined with the respect they deserved* except by a small number of outsiders, they were ridiculed and replaced as a matter of course first by the religion of brotherly love and then by the religion of science or else they were defused by a variety of 'interpretations' (cf. Section 2 above). Now there was much talk of liberation, of racial equality – but what did it mean? Did it mean the equality of these traditions and the traditions of the white man? It did not. Equality meant that the members of different races and cultures now had the wonderful chance to participate in the white man's manias, they had the chance to participate in his science, his technology, his medicine, his politics. These were the thoughts that went through my head as I looked at my audience and they made me recoil in revulsion and terror from the task I was supposed to perform. For the task – this now became clear to me – was that of a very refined, very sophisticated slave-driver. And a slavedriver I did not want to be.

Experiences such as these convinced me that intellectual procedures which approach a problem through concepts and abstract from everything else are on the wrong track and I became interested in the reasons for the tremendous power this error has now over minds. I started examining the rise of intellectualism in Ancient Greece and the causes that brought it about. I wanted to know what it is that makes people who have a rich and complex culture fall for dry abstractions and mutilate their traditions, their thought, their language so that they can accommodate the abstractions. I wanted to know how intellectuals manage to get away with murder – for it is murder, murder of minds and cultures that is committed year in year out at schools, universities, educational missions in foreign countries. The trend must be reversed, I thought, we must start learning from those we have enslaved for they have much to offer and at any rate, they have the right to live as they see fit even if they are not as pushy about their rights and their views as their Western Conquerors have always been. In 1964–5 when these ideas first occurred to me I tried to find an *intellectual* solution to my misgivings that is, I took it for granted that it was up to *me* and the likes of me to devise educational policies for other people. I envisaged a new kind of education that would live from a rich reservoir of different points of view permitting the choice of traditions most advantageous to the individual. The teacher's task would consist of facilitating the choice, not in replacing it by some 'truth' of his own. Such a reservoir, I thought, would have much in common with

a *theatre* of ideas as imagined by Piscator and Brecht and it would lead to the development of a great variety of means of presentation. The 'objective' scientific account would be one way of presenting a case, a play another way (remember that for Aristotle tragedy is 'more philosophical' than history because it reveals the *structure* of the historical process and not only its accidental details) a novel still another way. Why should knowledge be shown in the garment of academic prose and reasoning? Had not Plato observed that written sentences in a book are but transitory stages of a complex process of growth that contains gestures, jokes, asides, emotions and had he not tried to catch this process by means of the dialogue? And were there not different forms of knowledge, some much more detailed and realistic than what arose as 'rationalism' in the 7th and 6th century in Greece? Then there was *Dadaism*. I had studied Dadaism after the Second World War. What attracted me to this movement was the style its inventors used when not engaged in Dadaistic activities. It was clear, luminous, simple without being banal, precise without being narrow; it was a style adapted to the expression of thought as well as of emotion. I connected this style with the Dadaistic exercises themselves. Assume you tear language apart, you live for days and weeks in a world of cacophonic sounds, jumbled words, nonsensical events. Then, after this preparation, you sit down and write: 'the cat is on the mat'. This simple sentence which we usually utter without thought, like talking machines (and much of our talk is indeed routine) now seems like the creation of an entire world: God said let there be light, and there was light. Nobody in modern times has understood the miracle of language and thought as well as the Dadaists for nobody has been able to imagine, let alone create a world in which they play no role. Having discovered the nature of a *living order*, of a reason that is not merely mechanical, the Dadaists soon noticed the deterioration of such an order into routine. They diagnosed the deterioration of language that preceded the First World War and created the mentality that made it possible. After the diagnosis their exercises assumed another, more sinister meaning. They revealed the frightening similarity between the language of the foremost commercial travellers in 'importance', the language of philosophers, politicians, theologians, and brute inarticulation. The praise of honour, patriotism, truth, rationality, honesty that fills our schools, pulpits, political meetings *imperceptibly merges into inarticulation* no matter how much it has been wrapped into literary language and no matter how hard its authors try to copy the style of the classics and the authors themselves are in the end hardly distinguishable

from a pack of grunting pigs. Is there a way to prevent such deterioration? I thought there was. I thought that regarding all achievements as transitory, restricted *and personal* and every truth as *created* by our love for it and not as 'found' would prevent the deterioration of once promising fairy tales and I also thought that it was necessary to develop a new philosophy or a new religion to give substance to this unsystematic conjecture.

I now realize that these considerations are just another example of intellectualistic conceit and folly. It is conceited to assume that one has solutions for people whose lives one does not share and whose problems one does not know. It is foolish to assume that such an exercise in distant humanitarianism will have effects pleasing to the people concerned. From the very beginning of Western Rationalism intellectuals have regarded themselves as teachers, the world as a school and 'people' as obedient pupils. In Plato this is very clear. The same phenomenon occurs among Christians, Rationalists, Fascists, Marxists. Marxists no longer try to learn from those they want to liberate, they attack each other about interpretations, viewpoints, evidence and take it for granted that the resulting intellectual hash will make fine food for the natives (Bakunin was aware of the doctrinarian tendencies of contemporary Marxism and he intended to return all power – power over ideas included – to the people immediately concerned). My own view differed from those just mentioned but it was still a VIEW, an abstract fancy I had invented and now tried to sell without having shared even an ounce of the lives of the receivers. This I now regard as insufferable conceit. So – what remains?

Two things remain. I could start *participating* in some tradition and try to reform it from the inside. This, I think, is important. The time when Great Minds associating with Great Powers of Society could run the lives of the rest even in an ever so gentle way slowly comes to an end (this excludes Germany). More and more civilizations enter the stage of world politics, more and more traditions are regained by people living inside Western Societies. A person can either participate in these traditions (if they will have him) or shut up – he can no longer address them as if they were students in a classroom. For a long time now I have been a somewhat erratic member of a pseudo-scientific tradition – so I could try to encourage from within those tendencies I find sympathetic. This would agree with my inclination to use the *history of ideas* to explain puzzling phenomena and to experiment with forms of expression different from scholastic prose to present and/or expose ideas. I have not

much enthusiasm for such work especially as I think that fields such as the philosophy of science, or elementary particle physics, or ordinary language philosophy, or Kantianism should not be reformed, but should be allowed to die a natural death (they are too expensive and the money spent on them is needed more urgently elsewhere). Another possibility is to start a career as an *entertainer*. This is very attractive to me. Bringing a faint smile to the faces of people who have been hurt, disappointed, depressed, who are paralysed by some 'truth' or by the fear of death seems to me an achievement infinitely more important than the most sublime intellectual discovery: Nestroy, George S. Kaufman, Aristophanes, on my scale of values range far above Kant, Einstein and their anaemic imitators. These are the possibilities. What shall I do? Only time will tell. . . .