

## RATIONALITY AND JUSTIFICATION\*

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*1. Aim of this article.*

At first sight there seem to be four different possible approaches to the problem of rationality. First of all, one may study those philosophical schools or those cultural movements that are to be considered as defenders of "rationality", in comparison with schools that are to be considered as defenders of "irrationality". The schools will be selected either on the basis of their self-characterization or on the basis of the current opinion during some period or by means of one or another criterion for rationality. A second kind of approach consists in identifying rationality with some phenomenon or other, and then studying the properties of this phenomenon. Examples of such phenomena are (some part of) scientific praxis, the praxis corresponding to a certain philosophy of science, etc. In the third place, one may study the *meaning* of 'rationality', 'rational', etc. within natural language or within some specific part of it. All three kinds of approaches start either from a definition of rationality or from some actual use of the term.

A fourth kind of approach, viz. to search for "justified rationality", will be followed in this paper. The problem may be described roughly as follows : Under what circumstances and in what way may one justifiedly make use of one's "reason" ? This question is vague in the first place because the meaning of 'justifiedly' is unclear. By 'justify' I understand neither "build up from nothing" nor "build up on the basis of some or other kind of certainty which is not subject to criticism". As will become clear later on I rather believe with Otto Neurath /1933/ that "We are like sailors who must rebuild their ship on the open sea, never able to dismantle it in dry-dock and to reconstruct it there out of the best materials". The notion of justification is linked to that of rationality itself, and hence

a definition of justification would anticipate the discussion in this article. I shall return to the question of the resulting circularity in the following section. The aforementioned question also contains the term 'reason'. This term is used here in a loose way to denote the faculty that generates certain cognitive activities which will be described in more detail later. The use of this term does not imply that I subscribe to any ontological commitments with respect to this faculty.

## 2. A closer examination of our approach to rationality.

The kind of approach followed in this article prevents us from *a priori* identifying rationality with any particular phenomenon. For this reason some might object that this approach risks hanging in the air, not being connected with any concrete discussion, and hence would view it as unimportant if not illegitimate. It should be made clear first of all that our approach does not exclude the others and is not seen as independent of them. Its successful elaboration presupposes the development of the other approaches. It will lead to more trustworthy results of the other approaches are worked out better. Furthermore, the problem that this approach centers on is a very important one and is inescapable for one who reflects about his own activities. Even more, the other approaches will not lead to philosophically important results unless they are developed in close connection with the justificatory approach. Once a precise articulation of, say, some method has been arrived at, then the philosopher, at least if he wants not to be reduced to a historian, a philologist, or a mere constructor of systems, cannot escape from facing the question of whether or not this method is justified, what reasons there are to apply it (in a given context), and what is the import of its results. In this sense every meaningful philosophy is normative. And by the way, even historians, philologists, *et al.* must presuppose that there is some justified procedure by means of which they arrived at their results; this shows the unsoundness of e.g. historical anti-rationalist arguments *à la* Feyerabend.

As was mentioned in the preceding section, with respect to our approach it is not only impossible to identify rationality with some phenomenon, it is even impossible to determine beforehand what has to count as a sound justification. The fact that something is justified seems to be a criterion for its being rational. However, this is only so if the justification itself has to count as rational.

This creates a special complication with respect to the problem of justified rationality. I shall explain later on how this complication

should be approached in my opinion, but it should be made clear now already why the complication does not lead to a dead end. Obviously all of us have a hypothesis on the subset of human activities that may be considered *grosso modo* as rational and treat a certain set of information as justified. We shall see later that these facts play an important role in the elaboration of our approach. Furthermore, it is possible to inquire about what is justifiedly rational within certain limited contexts, for example the context of knowledge acquisition. Such contexts may be clearly specified by establishing a set of aims, with reference to which the criteria of justification may be defined to a certain extent. In such cases, however, one is always concerned with conditional rationality, with the rationality of means.

Precisely because we did not determine *a priori* what are sound criteria of justification, it becomes clear that the problem of rationality cannot be limited to the problem of the rationality of means. It is possible that purposes would turn out to fall beyond the scope of rational justification. But this has not yet been shown, in the first place, and if it were, one would have a very hard job proving that a rationality of means makes sense notwithstanding the fact that all purposes belong to the domain of irrationality.

### 3. Three "functions of reason".

There seem to be three different kinds of rational thinking : deduction, valuation, and construction. They are different in that they proceed in a different way and according to different criteria.

#### a. Deduction

This kind of thinking reduces to the application of a system of rules, for example a certain logic.

#### b. Valuation.

A valuation contains a deductive component but cannot be reduced to it. Let us consider an example in order to see why this is so. Suppose that someone wants to ascertain the reliability of some physical theory. He might begin by calculating, in case this is possible, the degree of confirmation of the theory. This is merely a matter of deduction. However, it is not sufficient. First of all one will have to know the degree of confirmation of certain competing theories in order to ascertain the reliability of the one under consideration; see e.g. my /1971/. And more importantly, one will have to justify the choice of the inductive logic, which is a kind of

method. Certain methods can be justified deductively. If the only requirement imposed upon a method is that it lead to a given goal, then a deductive argument leading from 'the method is applied' to 'the goal is reached' might be possible. Such an argument, however, is impossible in cases such as the one considered in our example. As everyone who is familiar with Carnapian inductive logic knows, a deductive justification of a specific inductive logic requires a kind of knowledge (about the degree of uniformity of the world) that has to be justified precisely by the considered method. Furthermore, it is clear that an inductive logic alone will not enable one to answer the question of the reliability of a physical theory completely. The answer will also depend, among other things, on the properties of the language in which the theorie is formulated.

A valuation will always consist of an "argument". Its essential difference from a deductive argument is either that the required system of rules, justifying the deduction, is not available, or that one has not enough information to reach the conclusion deductively (or both). Instead of a proof one can at best offer a "good reason". Hence we are dealing here with "argumentation" in the full sense in which this word is used by Chaim Perelman; see e.g. his /1968/. To offer a contribution to the study of argumentation would fall beyond the scope of this article. I shall only present some ideas on the matter. If A "works" or "is true" in a special case, then this forms a *positive argument* for A. If A "does not work" or "is false" in a special case, then this forms a negative argument for A. If there are only positive arguments for A (and no negative ones) and if there are no positive arguments for an alternative of A, then this forms a *good reason of the first sort* for A. If to every positive argument for an alternative of A there corresponds a positive argument for A, and if the converse does not hold, then this too forms a good reason of the first sort for A. Suppose that A is a possible method on level X. Let an X-alternative of A be an alternative of A on level X. If there are no good reasons of the first sort for A or for any X-alternative of A on level X, if there are good reasons of the first sort for A on a lower level and if there are no good reasons of that sort for any X-alternative of A on a lower level, then this forms a *good reason of the second sort* for A. It is typical for valuation, (i) that decisions are made on the basis of good reasons, and (ii) that methods of lower levels are adopted on higher levels without requiring a specific justification on a still higher level. Notice that mechanisms such as the ones described above hold (in part) for propositions and (in full) for methods. The adoption of a method might prevent one from adopting a proposition for which there are good reasons, and the

adoption of a meta-method might prevent the adoption of a lower level method for which there are good reasons, and all this without requiring absolute certainty about the soundness of a "highest level" method. Notice also that a valuation of A will proceed along different lines according to whether A has to be applied with respect to some practical decision or A has to be accepted provisionally and will be subjected to further study.

Clearly the concept of valuation is more problematic than the concept of deduction. It should be realized, however, that the final *justification* of a deduction has to rely on valuation. This application of certain rules may justify the result of this application. But to demonstrate that the rules are applied correctly is a different thing. If this demonstration is to be a deductive one, then another system of rules is required. And again another system of rules is required for demonstrating deductively that the former rules are applied correctly, and so on. This *regressus* can only be brought to an end by means of a valuation.

### c. Construction.

What is meant here are constructions of methods (given some aim), of questions (given other questions), of theories, of logical systems, of proofs, etc. These processes always contain a deductive component and sometimes also a valuative one. In this sense construction is a kind of goal-directed controlled fantasy, and exactly because of this qualification it is a "function of reason". With respect to knowledge construction even seems to be the most important one. It is responsible for logico-mathematical systems, theoretical science, and large parts of technology; see Granger /1967/ who is mainly concerned with the first two.

One might suppose that construction consists of a series of irrational steps each of which is followed by a controlling step. This view is clearly mistaken. Most constructions originate from a problem. In solving a problem one proceeds according to certain rules (one does not jot down an arbitrary axiom in looking for a proof). The steps are determined by certain rules which are accepted provisionally, and which are most of the time not completely adequate. As a consequence one may become blocked, in which case one will have to go back several steps and proceed again on the basis of an emendation of the former rules. The rules themselves, at least if they are conscious, are the consequence of a construction on the meta-level and are subject to valuation.

Given the interdependences between the different functions of

reason, one may distinguish between different kinds of irrationalists in this respect. Some will reject the possibility of a rational construction. In this sense Popper<sup>1</sup> and Reichenbach /1961/ are irrationalists. Others will also reject the possibility of a rational valuation. The complete irrationalist rejects even the possibility of rational deduction. It follows from what was said before that the irrationalist of the second kind will have trouble saving deduction from an irrational status, since the justification of a deduction must rely on a valuation.

#### 4. Some main theses.

In this section I shall try to present some ideas which I consider to be central and basic for the concept of rationality. In order to formulate them as clearly as possible I shall first of all state some presuppositions. The term 'subject' will be used to denote either an individual or a group. A first presupposition goes as follows :

(1) Every subject is confronted with a reality, the properties of which are not completely dependent upon the subject.

By 'the properties' I mean the properties as they *can* be known by the considered subjects, and not as they are known by them. I write 'not completely dependent' because (i) a subject is able to change certain properties of reality, and (ii) the concepts by means of which a subject approaches reality — in Etienne Vermeersch's /1967/ terms, the forms that he is able to discriminate — are dependent upon the subject in that they are determined by his sociological background and by his neurological properties. Finally it should be noticed that a subject (each one for himself) belongs to reality as far as he takes himself as an object of study, but does not belong to reality as far as he is determined by himself as an acting or knowing being. Let me now turn to the second presupposition :

(2) Every subject has a "world-view" as well as certain (not necessarily conscious) properties which co-determine his activities, including the changes the subject causes to his view of the world and to its properties.

By a "world-view" I mean a (coherent or incoherent) whole of cognitive, volitive, and emotive elements of consciousness. Notice that this includes among others all kinds of conscious methods. The view of the world and the intended properties will henceforward be called *epistemic factors*. They determine the subject with respect to his consciousness of his own properties and activities and with respect to his justifications and constructions (in the above sense). Opposed to these epistemic factors are *ontic factors* which depend

wholly on reality.

A first thesis on rationality concerns methods and can be expressed by means of the following rough formulation :

(3) Eliminate epistemic factors maximally from any method.

All such factors indeed form limitations on the adequacy of the subject's activities. (3) is somewhat misleading and inaccurate. First of all :

(4) Epistemic factors cannot be eliminated completely from any human method (or from any human activity).

But there is more. The simple fact that the role of epistemic factors is reduced by the introduction of ontic ones does not as such guarantee that the method in question becomes more rational. Consequently, the decision to introduce an ontic factor should only be made in case there are good reasons to suppose that the result will be a more adequate method. Hence the following requirement on the rationality of a method :

(5) If a method is rational, then the role of epistemic factors is reduced maximally by the introduction of ontic factors, for which it holds that their introduction leads to a more adequate method than the introduction of alternative ones.

The problem of applying this requirement will be discussed later in this section. It is clear at first sight, however, that the application of this requirement may lead to rather paradoxical results in certain cases. Suppose that someone has only a very limited knowledge and that he is rather sceptical even about this knowledge. He then might arrive at the conclusion that, according to his self-understanding, his methods fulfil the above requirement, even if they contain almost no ontic factors. The obvious additional requirement is the following :

(6) If a subject is rational, then his methods fulfil (5) and his view of the world contains the norm of maximalizing his knowledge about his epistemic factors and about ontic factors that might be suitable for reducing the role of epistemic factors with respect to one or another kind of method of the subject.

In order to apply (5) and (6) to an actual method or to an actual subject they must be reformulated comparatively. Indeed, an actual method or an actual subject are never rational in the absolute sense of (5) and (6). Notice also that (6) cannot be viewed as a requirement referring to methods alone. In judging the rationality of, for example, some action method, we have to refer essentially to the epistemic method of the subject if we want to express the requirement contained in (6).

Let us now discuss the application of (5) and (6), or rather of their comparative counterparts, to actual methods and actual subjects.

Such an application has to be performed by a subject (always in the above sense). We may consider three different possibilities here. (i) An evaluation of the rationality of some subject or of one of his methods by the subject himself. (ii) An evaluation of the rationality of some subject or of one of his methods by some other subject. (iii) An evaluation of some subject or of one of his methods, according to the subject's self-understanding, by some other subject. Case (i) is basic in that an evaluation of sort (ii) or (iii) by some subject will depend directly on the rationality of that subject himself. For this reason I propose to concentrate on (i). In this connection we cannot avoid the following observation :

(7) The evaluation of some subject or of one of his methods by this subject himself, must be performed with respect to the world-view of this subject.

This statement is trivial in that every evaluation by some subject depends ultimately of the world-view of the subject. Here again we are confronted with a circularity that cannot be avoided. It is a counterpart to the easily provable ultimate epistemological solipsism (which by no means involves metaphysical solipsism). Notice that (7) is quite compatible with a static view of the world. For this reason we have to add the following requirement :

(8) If a subject is rational, then he does not treat any statement or method as unquestionable.

This does not mean that a rational subject might not assign different degrees of certainty to different statements (including statements about the adequacy of methods). To some extent (8) corresponds to Popper's falsifiability requirement for theories. For any statement accepted by the subject and for any method adhered to by the subject, it should be possible that some or change in his world-view — such a change always depends partly on that world-view — forces the subject to give up the original statement or to replace the original method by another. By 'forces' I mean : forces according to the methods that are part of the subject's world-view. The present requirement is also related to (3). If some method is considered absolutely unquestionable, then it becomes impossible to reduce any further the epistemic factors that play a role in this method by introducing ontic factors.

There is obviously no reason to suppose that a subject would ever reach a completely justified world-view. Among other things this is the case because every subject is prejudiced with respect to his own world-view. There is no complete way out of this situation, but there is a serious chance of reducing the disadvantages of the situation if the following requirement is fulfilled :



(9) The world-view of a subject is confronted in a conflicting relation with a plurality of other world-views.

Such a situation will be called "pluralism". It may be the case for definite parts or for the whole of a world-view. The exact properties of the intended pluralism will be discussed in a later section. (9) is related to (3)—(5) in that the informations arising from the pluralistic situation are themselves ontic factors with respect to the subject, and in that the acceptance of this information (and hence of intersubjectivity) can only derive from the subject's own world-view.

To conclude this section I shall once more return to (5). It is commonly accepted by anthropologists that the use of tools has played a decisive role in the evolution of man. The fact that man has been able not only to survive but also to develop his own living conditions and his specific human abilities, is essentially dependent on the fact that he has been able to make a systematic use of tools. Furthermore, the whole development of technology may be seen as a generalization of this. The requirement contained in (5) is directly connected to a further generalization of this phenomenon. The limitations and the prejudices of man are overcome progressively by the introduction of ontic factors, not only with respect to action but with respect to all human activities. A second remark concerning (5) pertains to the fundamental role played by knowledge. In order to fulfil the requirement contained in (5), the subject has to discover ontic factors that can be introduced justifiedly. This presupposes that the subject has justified knowledge at his disposal. This illustrates again the necessary circularity which is involved in the evolution of a subject's world-view towards rationality. A subject arrives at justified knowledge on the basis of his world-view at a given time, and it is only by means of this knowledge that the world-view can be improved in a non-trivial way at a later time. Obviously this circularity is harmless as such, since it is only of a conceptual nature and not of a criteriological one. Such a circularity does not prevent the view of the world from improving progressively. But it is possible that both reality and a given world-view are such that this view of the world either becomes static or develops in such a way that it constantly returns to a certain state after a constant or variable schema of changes. All we can say is that our present history proves that we have not yet arrived in such a situation and that there is no reason to suppose that we ever will.

The view developed in this section may be considered a formal approach to the problem of rationality. The following pages will be devoted to the application of this view to some specific human activities. I shall try to offer some good arguments for this view as

well as show that it enables us to state some important points concerning these activities.

##### 5. *The problem of empirical knowledge.*

We are concerned here with the gathering of knowledge about reality, in order to understand reality as much as possible and in order to transform ourselves and reality in as adequate a way as possible in view of a set of purposes. Let us have a closer look at the different elements that play a role in the description of this problem.

The reality about which we want to gather knowledge is that which is given by our sensory perception. It is clear that the verification of our knowledge of this reality is to some extent determined by the definition of this reality. It is less easy to articulate the status of this reality. On the one hand we are obviously not concerned with reality *such as* it appears (or is given) in our sensory perception. We know from experience that our perception may happen to be incorrect. This means that we view the aforementioned reality as different from our actual perception. But on the other hand this reality is also different from the reality "an sich". I return to this point later.

For the time being it is sufficient to say that our knowledge consists of a set of propositions. By 'understanding reality' I mean : to have a model (in the non-technical sense) of reality on which causal relations are defined. I will not discuss the problems connected with the fact that the concept "causality" and the connected concept "explanation" may have different meanings in different periods of time and for different persons; see for example Hanson /1963/ in this connection. If we are able to transform reality in view of a given aim, then our set of knowledge necessarily contains non-general propositions that describe in part the concrete state of the world at a given time. Furthermore, it is necessary that some of these non-general propositions be about the future. With respect to the above transformation of reality it is not necessary that our knowledge contain any general propositions. The predictions may be derived from theories but may also be the result of arguments by analogy. The same holds in principle for our understanding of the world. However, it will become clear later on that our knowledge, or at least our world-view, always contains general propositions. Notice that there is a difference between transforming ourselves as a subject, e.g. by transforming our model of the world, or some of our methods, and transforming ourselves as an object. The latter, exactly like a transformation of reality in general, presupposes that we are

acting beings. By an "adequate transformation" I mean a transformation which leads to its specific purpose and which furthermore fits within the whole system of activities that are undertaken in view of the whole set of purposes of the subject. Notice also that the present problem is discussed without reference to the justification of purposes.

Let me finally point out that the gathering of scientific knowledge may be described as the modification on the basis of a certain method, of some subset of our knowledge elements. Hence, this phenomenon is explicitly linked to our world-view : what matters is the transformation of our world-view in such a way that it most adequately serves its function with respect to the understanding and transformation of reality. If we want to attain this purpose, then we clearly have to search for a method that leads to it, and we have to search for criteria that enable us to decide whether or not the relevant parts of our world-view fulfil this function (in some degree). Consequently, we have to search for a justification of, on the one hand, the relevant parts of our model of the world, and, on the other hand, the methods used. The use of reason immediately becomes indispensable, since we need it for justifying statements and methods.

### 6. *Observation.*

Among the components that play a role in the process leading to empirical knowledge are the following : (i) observation, (ii) a logic of discovery, (iii) an inductive logic or logic of acceptance, (iv) a deductive logic. It is clear at once that (ii)-(iv) are epistemic factors. Obviously, we may study these factors within our own or other people's epistemological methods, but this by no means eliminates their role within the epistemic process itself, nor does it make them less dependent on the epistemic subject. These components may or may not be conscious, and may or may not be constructions of the reason. Furthermore it is possible that there is a discrepancy, with respect to one or another component, between the method actually followed by the subject and his conscious image of this method. The relevance of all this will become clear in later sections.

In comparison with components (ii)-(iv), observation seems to be, at least at first sight, an ontic component. But on closer examination a large number of epistemic factors turn out to play an essential role in observaton. I shall list some of them here.

(i) Observation is limited by the fact that we are dependent on our senses. These are only capable of providing us with information

about certain aspects of reality (not e.g. radio-activity) and this information is for the largest part rather imprecise (temperatures, lengths, etc.). Furthermore, we know by experience that our senses are frequently mistaken in identifying, respectively not identifying, certain states of affairs.

(ii) If we limit ourselves to the observation of facts occurring in our immediate environment, then we are both awfully dependent on chance and limited to certain kinds of observations.

(iii) The results of our observations are co-determined by emotive states, by emotive attitudes with respect to certain facts, etc. Furthermore they are influenced by a number of social-psychological mechanisms. This too leads to incorrect or incomplete observation.

(iv) Both psychologists and philosophers have come to the conclusion that our observations are also influenced — more exactly both limited and oriented — by the conceptual structure or language used. Notice that this does not merely hold for the description of observation but also for observation itself.

(v) Our observations are dependent on theories, viz. on those theories that are either accepted or tested at the moment of the observation. First of all the subject is influenced by the observations that he expects to make and by the kind of observations that he is interested in. Secondly, the subject is influenced by the actions that he performs in view of the gathering of information. As far as intended transformations of reality are concerned, these actions depend on accepted theories. And they depend on the theories being investigated in that these transformations are caused in view of the gathering of information that is relevant to the investigated theory. Thirdly, the accepted theories add supplementary information to the observation (and *a fortiori* to its description). Indeed, we do not experience our observations as phenomenal but as factual, and we are not even able to describe our observations in a purely phenomenal way.

(vi) Apart from the limitations connected with the language used and the accepted and tested theories, a number of implicit conceptual and theoretical prejudices influence our observations.

(vii) Observation is also dependent on the actions of the subject. I have already referred to this in (v), and I have mentioned that these actions depend on theories. Apart from this, actions are limiting in that they depend on certain properties, e.g. physiological ones, of the subject.

All this leads to the conclusion that observation is loaded with numerous epistemic components. It is clear that these have a detrimental effect on observation as a source of knowledge. They

might be described as constituting a "noise" which lowers the probability of a correct observation. But furthermore, none of them can be eliminated completely, given the beings that we are. It is only through reason that we might hope to construct and justify modifications in our observation methods that lead to a partial reduction of the detrimental effect of these components.

Let us now come to a first and partial application of my view on rationality to the problem of observation. The limitations on observation that are mentioned in (i) are reduced by the introduction of instruments. As Etienne Vermeersch /1967/ has shown, the introduction of instruments has the advantage that our observation is reduced to very simple operations, which has as a consequence that the chance of a mistake is reduced, while on the other hand the result of the observation is much more precise than it could possibly have been without the use of instruments. It is also clear that instruments might lead to the identification of properties that cannot be observed by making a direct use of our senses. Notice also that the use of instruments leads to a reduction of the role played by emotive states and emotive attitudes (see (iii)). The limitations described in (ii) may partly be overcome by the performance of experiments. The essential point here is that we perform actions with the intention of transforming reality into a state that seems advantageous for the increase of our knowledge. Notice that one would never have been able to develop present-day chemical theories without such actions; remember the absence of the pure state of most elements in nature. An experiment might be seen as the reduction of one epistemic factor (the accidentality of our observations) by means of another (the performance of actions). Action is indeed limited by epistemic factors (see (v) and (vii)), but experiments contain ontic factors in that the actions are intended to lead to a predetermined result — and it can be verified afterwards whether this result is reached or not. The limitations connected with actions, especially those mentioned in (vii), can be reduced by the development of a technology<sup>2</sup>. Here we get a positive feedback: the acquisition of knowledge leads to a technology which in turn makes a quantitative and qualitative amelioration of knowledge acquisition possible. The introduction of intersubjectivity may be viewed in the same light in that it constitutes a check on a subject's observations. Notice that the check from intersubjectivity must be regarded as an ontic factor with respect to the individual subject. Certain aspects of intersubjectivity are discussed in the following section.

Although the contents of the preceding paragraph might seem plausible, a philosopher should ask the question of how the

introduction of the aforementioned ontic factors is justified. Two possibilities are open here. One might require a foundation or justification from unquestionable premises. If one opts for this possibility, then one must have recourse to abstract reasoning, the disadvantages of which are known from experience. The result will either have to be distrusted on historical grounds or, for example, if it is some kind of scepticism, will be contrary to our actual behaviour. The second possibility is that we do not require an absolute foundation but accept to start from a not completely certain basis. In this case we might start from our actual view of the world. It might be mentioned in favor of this procedure that we have such a world-view anyway, and that, although we are not completely certain about its adequacy, we are more certain about several parts of it than about alternatives to these parts. To search for an optimal observation method means then : to change our observation method on the basis of our present world-view, viz. in such a way that it becomes more reliable according to this world-view. Given the fact that we have, and must have, a view of the world, and given the fact that certain methods of observation are more adequate than others in view of this world-view, rationality obliges us to follow these methods. There is one obvious restriction here : not all parts of our world-view are assigned the same degree of certainty, and we shall not let the less certain parts interfere with the more certain parts — we might reach a worse method of observation, if we did. It is for this reason among others that the rationality involved is an evaluative one and not a deductive one. As will become clear later on, it is possible to come to a factual verification (hence an ontic factor, albeit on the basis of our world-view) after we have made such an evaluation and after the resulting method has been applied.

### *7. Theories.*

The limitations of observation deriving from theories have already been mentioned in the preceding section. Analogous limitations hold for our understanding and explanation of (certain parts of) the world and for our actions. The adequacy of these activities is interfered with to the extent that our theories and their consequences are false. The addition of 'and their consequences' is important since a false theory might in principle lead to a correct understanding and explanation of certain phenomena and to correct actions with respect to certain problems and with respect to certain states of parts of the world, viz. in case only true consequences of the theories are relevant to these activities.

These disadvantages deriving from the role of theories may be reduced by operating with a plurality of theories at the same time. This should be unquestionable to anyone who has read e.g. Feyerabend /1970/, although the author starts from another problem. Thanks to this plurality we shall be confronted with different "interpretations" of "the same" parts of reality. The advocates of the different theories will try to show the disadvantages of and errors in the theories of their opponents, from their own point of view but perhaps in the language of their opponents. The opponents are better placed than the advocates of conflicting theories to notice these disadvantages and errors and, as good advocates of their own theory, they will be committed to doing so. 'Pluralism' has many meanings, and we need a specific pluralism here, viz. one that leads to a situation in which the following holds : (i) advocates of a theory try to defend it maximally by gathering facts in support of their theory and by critically examining arguments against this theory, (ii) they try to destroy rival theories by gathering facts and through methodological criticism, and (iii) they explicitly compile information discovered by their opponents and take it into account in an unprejudiced way.

The reason for introducing this pluralism is that a subject might start from a theory that prevents him from introducing ontic factors which are justifiable in principle. For a more detailed defense based on arguments from the history of science the reader is referred to the aforementioned paper by Feyerabend and also to his /1965/. These papers also contain more details on the needed kind of pluralism; for example, it is argued there that the alternative theories should be strongly different from one another. Obviously, certain practical objections can be raised against this pluralism and against the corresponding proliferation of theories. Unbridled proliferation is impossible for economic and other reasons. In this connection Adolf Grünbaum is clearly right in defending a position (in his /1973/) which can be rendered as follows : it is rational (evaluative argument) that only small groups continue to adhere to theories that have been refuted.

It should be stressed that a plurality of theories such as the one argued for here presupposes certain emotional commitments on the part of the advocates of the different theories. If they do not have this commitment, they will not attack and defend the theories to a sufficient extent. This shows the necessity of an emotional attitude for some rational activity. This attitude too is an epistemic factor and, although its role must be reduced in the same way as that of other epistemic factors, it should by no means (and can by no

means) be eliminated. It should rather be guided with respect to certain aims.

A word or two should be added on the role of tests with respect to theories. Tests are performed through observation and it is the ontic factors in observation that make it valuable for checking the theory. Falsifications may give rise to *ad hoc* hypotheses. Apart from numerous disadvantages, the latter have the advantage of replacing a formerly implicit hypothesis by an explicit one. Falsification also leads to further complication of the conceptual structure: the conceptual and theoretical problems that arise on the occasion of the falsification of a theory guarantee in most cases that the "new" theory will be formulated within a rather complex conceptual structure (see Popper /1959/).

It is obvious that theories, which were discussed above as epistemic factors and hence as disadvantageous to our knowledge situation, play an essential role in this knowledge situation. They form a central part of our world-view. In view of their epistemic status, they contain ontic factors, and as such, they are essential for the introduction of ontic factors within all kinds of methods. Notice that this holds also for methods applying to domains that are quite distant from the facts that the theory is about; for example the carbon method for determining the age of archeological sites. (Incidentally, this is a positive argument for theoretical science). All this illustrates how the circular justification of a world-view works out.

### *8. Some further applications to man's knowledge situation.*

It was already mentioned that methods may be criticized and amended on the basis of theories and factual beliefs that form part of a world-view. As a special case one may weigh methods against one another with respect to their results. Every method which is minimally self-correcting will, after being applied for some sufficiently long period of time, lead to historically consecutive sets of propositions that are inconsistent with one another as a consequence of the increase of observation *data*. If we are committed to the method used to the extent that we consider later sets of statements more reliable than former ones, then we may examine whether alternative methods would not have made "fewer mistakes" than the one actually used and the result may be used as a basis for the choice of a method. The epistemic components continue to play a role; we remain dependent on the originally used method. But on the other hand we succeed in choosing a method more dependent on



reality. Needless to say, we are always confronted with an evaluation in such a case. The role of pluralism with respect to the discovery and justification of methods is obvious.

Hume's problem of induction is irrelevant from our point of view. We can only rely on our view of the world. This always presupposes induction, since it ascribes a certain order to the world; maximal entropy would equal zero information. This position is analogous to the result reached by Martin Hollis /1968/ in another context. He argues that the idealist as well as the realist, if they want to be empiricists, cannot solve the riddle of induction because according to their world-views, the real world is characterized precisely by the fact that it is not chaotic. The empiricist "cannot afford to divorce 'being real' from 'being inductively authenticated'". Hume's problem reminds us that we always approach reality by means of fallible criteria, and that we may never be certain of knowing reality. But we cannot do anything else than use the criteria contained in our world-view, and criticise them as much as possible. From this point of view, the solving of Hume's problem would only result in the disaster of dogmatism.

One might suppose that our criteria for rationality do not apply to the choice of logics and languages. Our criteria are indeed quite removed from, for example, Carnap's /1950/ requirement that a logic or a language should be as rich as possible; this means for example for a logic that it allows for the deduction of a maximal number of theorems. However, logics and languages can be submitted to our criteria in an indirect way. Notice indeed that a falsified theory may be "saved" by a change in this theory but also by a change in the structure of the language or in the logic. This means that logics and languages are to be justified together with the theories that are formulated by means of them.

In section 6 and indirectly also in later sections we have seen how the disadvantages of observation may be reduced. These disadvantages may be considered as noise. We can only eliminate a noise, if we can make it apparent by modifying either the source (reality), the receiver (the subject), or the channel (the actually used method). There is no reason to suppose that the modifications which we can perform will make all noises apparent. This means that it does not make sense to attempt to reach reality "an-sich". The reality we are interested in is "reality as it appears in an ideal observational situation". Whether we accept that we have reached such a situation is a criteriological matter. We might rationally accept this in a situation where we cannot see how our observational method could

be improved (how more rationally justified ontic factors could be introduced) and in which the constant stream of new information remains consistent with our view of the world. Obviously, this would not happen before the end of time. The view that I am defending implies that we benefit from considering a correspondence definition of truth, and not only a criteriology for truth. (see Nicholas Rescher /1973/ in this connection). Only in doing so will we be forced to remember constantly the discrepancy between reality and that part of our world-view which should describe it.

### 9. *Rationality and values.*

Apart from empirical statements and methods, a view of the world also contains values, norms and purposes. My view on the rationality connected with these is that the general requirements mentioned in section 4 should be applied here too. In tackling the problem of the rationality of values and norms, philosophers usually start from Hume's difference between norm and fact — let us call it Hume's problem of norms. Such an approach is similar to an approach to the problem of empirical knowledge from the point of view of Hume's problem of induction. I have pleaded "irrelevance" in that context, and will do the same here. The problem of empirical knowledge is (roughly) to replace parts of the world-view with justified alternatives in which ontic factors play a greater role. The problem of values is exactly the same. We shall start our discussion from the factual observation that human beings pursue certain *purposes*. Questions about the justification of norms and values can be reduced to questions about the justification of purposes. With respect to the problem of empirical knowledge I have argued that a justification has to be performed with respect to the world-view of the subject in question. I shall argue for the same point of view in this connection. Finally, I shall defend the necessity of pluralism for the justification of sets of purposes.

One cannot escape from asking the question of whether one should search for a justification of purposes. The complete irrationalist may very well answer this question in the negative. To others one might argue that it can be shown by rational means that the sets of purposes (and norms and values) to which people subscribe are extremely important (for themselves and for others) as regards their factual (psychological and social) implications. Furthermore, it is clear that a justified whole system of purposes, values, etc. is not available. Notice also that the majority of our relevant views are acquired and adhered to on purely irrational bases.

With respect to the justification of whole systems of purposes, it is of the highest importance to realize that such wholes are ordered in two hierarchical ways : the one taking into account the importance of the purpose for the subject and the one which places purposes in an end-means relation with respect to other purposes. These hierarchies provide us with a starting point for a critical examination of a whole system of purposes and for the justification of modifications in it. The fact that the subject pursues these purposes validates this procedure. We need not take the non-existing radical irrationalist into account, and we need not worry about Hume's problem. Given the fact that we pursue a whole system of purposes, we cannot escape from trying to make it sound.

There is no particular problem with those purposes that can be classified as means with respect to others. Means can be justified in a straightforward way, or at least they can be so justified in principle, given a sufficient amount of factual knowledge. Irreducible purposes can also be criticized by certain unquestionable methods. One may investigate the factual possibility of their collective realization with respect to the present state of the world and with respect to possible states of the world. One may also investigate the consequences of their realization in the present and in possible worlds. All this might lead to some justified improvement of the whole system of purposes, but, needless to say, mutually incompatible sets of purposes might remain unrejected. Here the aforementioned pluralism comes to play its role. Notice that the pluralism intended should have exactly the same properties as that introduced for empirical knowledge. Such a pluralism has consequences for the organization of groups (democratic structures, the advantages of which should, however, be denied to people who want to destroy them), it has consequences for the organization of interpersonal relations (no (irrational) persuasion, except to make people susceptible to rational argumentation in case no other means remain), it has pedagogical implications (to raise all members of a society to members of full value; i.e. no indoctrination unless indoctrination to openness).

Here are some advantages of this pluralism. (i) The members of a society are confronted with alternative ideologies which are at least minimally livable in their society and which occur in a concrete and detailed form. (ii) These individuals will be subject to critical remarks on their ideology, whereas they would not have been able to formulate these critical remarks themselves, given their commitment to their ideology. (iii) They will be confronted with facts which they were unable to notice in view of their prejudices. (iv) They will be confronted with certain emotional and moral attitudes with respect

to certain facts, and they may adopt these even if they were unable to arrive at them within their own ideology. Notice also that the reasons for adopting such a pluralism are methodological and not ethical<sup>3</sup>.

#### 10. *Final remark.*

The aforementioned sections are concerned with rationality as occurring in connection with justification. Obviously, one has not only to justify, one has also to make decisions, and it is clear that one must always make decisions in a situation in which the world-view or even its relevant parts are not fully justified. Here we come to a dichotomy between the individual who refrains from decision and action because of a lack of information — hence is doomed to immobility — and the one who decides and acts without having sufficient justification available. This dilemma has again to be resolved within the given world-view itself. Statements contained in it on the metalevel must determine the course of action to be taken. It might very well be perfectly rational then (if the statements on the metalevel are rationally justified to a sufficient extent) to decide to act without looking for more information and without taking account of a pluralistic procedure. To mention just one instance, it would be irrational to claim that no revolution was ever justified.

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#### NOTES

\*I wish to thank Miss Mary White for her careful revision of the English.

<sup>1</sup>Popper /1959/ writes : "The original stage, the act of conceiving or inventing a theory, seems to me neither to call for logical analysis nor to be susceptible of it. The question how it happens that a new idea occurs to a man /.../ may be of great interest to empirical psychology; but it is irrelevant to the logical analysis of scientific knowledge."

<sup>2</sup>The study of the rationality of human action is extremely important. Unfortunately, the length of the present paper does not allow me to discuss the application of my view on rationality to this domain.

<sup>3</sup>I realize quite well that the discussion of my point of view with respect to values is too brief to be convincing. The matter will be worked out in another paper.

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