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The Problem of Foundation

1. THE SEARCH FOR FIRM BASES

Whoever seeks to grasp the nature of knowledge or to distinguish genuine knowledge and true understanding from mere opinions, assumptions, or subjective views, will very quickly come up against a problem which is normally regarded as a central—if not the central—problem of epistemology: the problem of foundation. This problem appears to be of particular importance for the sciences, for they are considered by virtue of their procedures and their results to be a model for all of human knowledge. They generate knowledge purported to be more systematic than everyday knowledge, more methodologically secure and especially solid in its foundation, which must, therefore, be preferred to everyday knowledge. Anyone who agrees with such assertions would find it tempting to inquire after the basis of our knowledge as such and thereby to pose the problem of foundation in a form which initially appears very plausible.

In order to understand this problem—the question of how our knowledge is grounded—one might take as a starting-point a situation which may be characterized as follows: when we strive for knowledge we obviously want to find out the truth about the nature of some real relationship; we wish to form for ourselves true convictions concerning definite areas, sections, or parts of reality. In doing this it seems quite natural that we strive for certitude as to whether what we find is also true; and such a certitude seems attainable only if we possess a basis for our knowledge, i.e., if we can establish this knowledge so securely that it is beyond all doubt. It seems, then, as if truth and certitude are closely connected in human knowledge. The search for truth, for true conceptions, convictions,

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1 Cf. René Descartes, Meditations on First Philosophy (1641); “And I shall ever follow in this road until I have met with something which is certain, or at least, if I can do nothing else, until I have learned for certain that there is nothing in the world that is certain. Archimedes, in order that he might draw the terrestrial globe out of its place, and transport it elsewhere, demanded that only one point should be fixed and immovable; in the same way I shall have the right to conceive high hopes if I am happy enough to discover one thing only which is certain and indubitable” (2d Meditation). The Philosophical Works of Descartes, vol. 1, trans. Haldane and Ross (Cambridge, Eng., 1931), p. 149. In other philosophers, too, this striving for certainty, for a certain foundation, finds clear expression: cf., e.g., Johann Gottlieb Fichte, Grundlage der gesamten Wissenschaftslehre (1794), Meiner edition (Hamburg, 1954), pp. 11 ff., or the work of Hugo Dingler.

2 It is well known that this principle plays an essential role in the thought of Leibniz, Monadology (1714), where (in §31 and §32) the principle of contradiction and the principle of sufficient reason are depicted as the two great principles on which the use of reason is based: “... the principle of contradiction in virtue of which we judge false that which involves a contradiction, and true that which is opposed or contradictory to what is false ...” and “... the principle of sufficient reason, in virtue of which we hold that there can be no fact real or existing, no statement true, unless there be a sufficient reason why it should be so and not otherwise, although these reasons usually cannot be known to us.” (Latia translation of Monadology [Oxford, 1889]) One sees that two assertions are combined here, one relating to facts, the other to statements. It was Arthur Schopenhauer who indicated
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an axiom it has disappeared from textbooks of logic. Moreover, it is hard to see how it could nowadays be accommodated in them or how it could be reformulated in such a way as to make its inclusion appropriate. It would at the very least have no function and might even be disruptive. If, however, we formulate it as a methodological principle, we have gained something which we may with some justice regard as a general postulate of the classical methodology of rational thought, as the fundamental principle of that model of rationality that appears to dominate in classical epistemology. This principle states: always seek an adequate foundation—a sufficient justification—for all your convictions.\(^1\) One sees at once that this principle of adequate foundation or sufficient justification may be extended without further ado from theoretical to moral and political convictions—and indeed, to assertions of all kinds, if only one is ready to make a decision not to restrict arbitrarily the application of this model of rationality to a single sphere. Whoever strives for certainty will assume the self-evidence of this demand that all convictions should be based upon certainties—and that means not only convictions involving cognitive claims, but also others, such as those possessing a normative character—as long, that is, as he has not come up against the difficulties that follow from this principle. So he will be ready to admit that only sufficiently justified statements

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\(^1\) In his book, *Abriss der Logik* (Berlin, 1958), Kasimirz Ajdukiewicz points out (in part 2, chapter 1, “Über die Arten und die Notwendigkeit der Begründung von Sätzen,” §11: “Der Staat des zureichenden Gründes,” pp. 72 ff.) that the principle may be formulated as a postulate. It is then identical with the demand of critical thought, which is opposed to any kind of dogmatism. We shall see that this thesis is problematic.

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in the above-mentioned sense can lay claim to general recognition. Only a recourse to the Archimedean point of thought presupposed by this demand can provide the certainty necessary for an adequate foundation. Of course, at this point the question at once arises as to whether and in what manner the Archimedean problem may be solved in the sphere of thought, for the application of the principle of sufficient justification presupposes that this problem has been solved.

If this methodological idea can be made a reality in the sphere of knowledge or in one of its subdivisions, then clearly one can know of that sphere that the search for truth has been successful, that one has attained true convictions. Anything, however, which does not harmonize with the true view must be not only unfounded, but also false. Thus the process of the acquisition of knowledge seems, for the particular sphere concerned, to have come to an end. The problems have been solved; their solutions may be learned, passed on, and applied without any need to subject them to further questioning. From this a further methodological principle of rational thought seems to emerge: the demand that at any given time the sole true view, the correct theory for the sphere in question, should be sought, and accordingly all possible alternatives rejected; for alternatives to the truth must obviously be false. In fact, any kind of thinking in alternatives appears incompatible with the idea of truth. Thus the postulate of sufficient justification is apparently closely connected with a further principle: the postulate of theoretical monism. The one true theory relevant to the field of thought in question or the sector of reality to be analyzed must be extracted and adequately grounded so that one may be certain of its truth. Classical epistemology seems to be inspired by this conception of rational thought; but not it alone. For one cannot possibly maintain that foundationalism of this type has been overcome in all fields of thought. On the contrary, even today it is more or less the basis of many methodological approaches in philosophy, the sciences, and in social practice without ever being clearly stated. These approaches often differ in many details, above all in
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their answer to the question of what an adequate foundation looks like in individual cases; but they all concur in their basic principle: in the demand for such a justification, for a foundation for knowledge and action.

2. THE PRINCIPLE OF SUFFICIENT JUSTIFICATION AND THE MÜNCHHAUSEN TRILEMMA

The question of what a sufficient justification might be seems necessarily to point toward that science which is primarily involved when the validity of arguments is to be judged: the science of logic. We may assume that logical inferences play an essential role in the justification of views of all kinds. We may regard the problem of logical inference as the central theme of formal logic.  

It provides us with information as to what a valid deductive argument looks like and what such an argument can do. It may be advisable at this point to consider the matter very briefly.

A valid deductive argument—a logical inference—is a sequence of statements, of premises and conclusions, between which definite logical relationships exist; a conclusion, namely, is deducible from the premises in question with the aid of the rules of logic. “Premise” and “conclusion” are to be understood as deduction-relative concepts; they refer to the logical role of the statements in question in a particular inferential context, not to the statements per se. For our purposes—in the context of our foundation problem—a few simple relationships, familiar from formal logic, are of interest:

1. Logical inference can never achieve an increase of content. The logical range of the propositions involved may increase as the deduction proceeds or it may remain the same; the information content may decrease in this process or it may remain the same. From a set of propositions one may, as it were, derive by a deductive process only the information already contained in it. Such a process serves to “milk” a set of statements, not to generate fresh information. This means among other things that no propositions with content may be deduced from analytical statements. Conversely, however, analytical propositions are deducible from statements with content, for they are deducible from any statement whatever. That a proposition may be logically deducible from informative statements thus says nothing about its own logical content. On the other hand any kind of proposition may be deduced from contradictory statements.  

2. The validity of a deductive argument says nothing about the truth of its components. More precisely: in such an argument all the components may be false, the premises may be all or partly false and the conclusions may be either true or false; only one case is impossible: false conclusions cannot follow from entirely true premises. If, then, all the premises are true, the conclusions derived from them are also true. To put it another way: the validity of a deductive argument only guarantees

a. the transfer of the positive truth value—the truth—from the set of premises to the conclusion; and thus

b. the transfer of the negative truth value—the falseness—from the conclusion back to the set of premises.

3. An invalid deductive argument produces a wrong inference that affords no such guarantee. In this case, therefore, no combination of positive or negative truth values of the components of the argument is excluded. This concludes our excursus into logic.

Now, back to the problem of foundation. What role can logical inference play here? In accordance with the principle


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formulated above, we may assume that the goal of the foundation procedure must consist in securing the truth of the views involved, and thus of the statements in which they are formulated. The truth—the positive truth value—is, however, transferable by logical inference. This gives rise to the idea that it may be possible to found a conviction—and thus a set or system of statements—by referring it back to secure and indubitable grounds by logical means, i.e., with the help of logical inferences; and that in such a way that all components of the set of propositions involved are produced from this foundation by logical inference.

If, however, our principle is to be taken seriously, the following problem arises at once: if one demands a justification for everything, one must also demand a justification for the knowledge to which one has referred back the views initially requiring foundation. This leads to a situation with three alternatives, all of which appear unacceptable: in other words, to a trilemma which, in view of the analogy existing between our problem and one which that celebrated and mendacious baron once had to solve, I should like to call the Münchhausen trilemma. For, obviously, one must choose here between

1. an infinite regress, which seems to arise from the necessity to go further and further back in the search for foundations, and which, since it is in practice impossible, affords no secure basis;

2. a logical circle in the deduction, which arises because, in the process of justification, statements are used which were characterized before as in need of foundation, so that they can provide no secure basis; and, finally,

3. the breaking-off of the process at a particular point, which, admittedly, can always be done in principle, but involves an arbitrary suspension of the principle of sufficient justification.

Since both an infinite regress and a circular argument seem clearly unacceptable, one is inclined to accept the third possibility, for the simple reason that no other way out of the situation is thought to be possible. Of statements where one is prepared to break off the foundation process, it is customary to use words such as “self-evident,” “self-authenticating,” “based upon immediate knowledge”—upon intuition or experience—or in some other way to render palatable the fact that one is prepared to break off the foundation regress at some particular point and suspend the foundation postulate with respect to this point, declaring it to be an Archimedean point of knowledge. The procedure is analogous to the suspending of the causal principle by the introduction of a causa sui. But what are we to make of a statement that cannot itself be justified, but must assist in justifying everything else; that is represented as certain, despite the fact that one can really doubt everything—including the statement—on principle; that is an assertion, the truth of which is certain and therefore not in need of foundation? If such a conviction or statement is called a dogma, then our third possibility is revealed as something one would have least expected in a solution to the foundation problem: justification by recourse to a dogma. It looks as if the search for the Archimedean point of knowledge must end in dogmatism; for at some point the foundation postulate of classical methodology needs to be suspended. A recourse

[1] In this connection Hugo Dingler’s treatment of the problem of the validity of logical principles should be pointed out; cf. his Philosophie der Logik und Arithmetik (Munich, 1931), pp. 21 ff. In connection with the criterion of truth, he constructs a situation that completely corresponds to the Münchhausen trilemma in its structure. Dingler has grasped the structure of the situation very clearly and found a solution, to which we shall return. Incidentally, even earlier the question of the justification of knowledge had produced analyses in which the trilemma emerged in a more or less clear form; cf. Richard H. Popkin, The History of Scepticism from Erasmus to Descartes (rev. ed., Assen, 1964), pp. 3, 52, 137, and passim. The total crise pyrrhonienne brought about by the Reformation, the Renaissance, and the rise of the new natural sciences—a crisis that simultaneously rendered faith and knowledge problematical—was overcome philosophically by the answers of classical rationalism, which themselves later turned out to be questionable. On this problem see also Gerard Radnitzky, “Über empfehlenswerte und verwertliche Spielarten der Skepsis,” Ratio, vol. 7 (1965), pp. 109 ff.

[2] Blaise Pascal saw this very clearly in his day; see his short work “De
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to extralinguistic authorities of whatever kind affords no assistance in this respect, as is easily seen. Quite apart from the particular problems that can arise where such authorities are concerned, there is always the possibility that a demand for justification may be made of them as well. All claims of self-justification made for ultimate authorities of this kind must, like similar claims made for particular statements, be regarded as a masquerade disguising a decision to waive the principle in this particular instance. It then looks as if such a decision is unavoidable, so that the dogmatism connected with it seems a necessary evil—or even totally harmless.

Incidentally, the situation is not essentially altered if inferential processes other than those of deductive logic are introduced in order to bring about the foundation regress. Neither the use of inductive procedures of any kind nor recourse to some transcendental deduction can help to remedy the situation; nor is it basically altered if one shifts the problem from the horizontal plane—that is, from the analysis of contexts of statements on the same linguistic level—to the vertical, on which one seeks adequate justification of one’s criteria for

l’esprit géométrique et de l’art de persuader” (1658), in which the “true method” of demonstration, which consists in “defining all concepts and proving all assertions,” is reduced ad absurdum, because it would involve an infinite regress (Fascal, Œuvres complètes, ed. Louis Lafuma [Paris, 1963], p. 348). On this problem see also William Warren Bartley III, The Retreat to Commitment (New York, 1962), especially chapters 4 and 5.

* Such a procedure was proposed and elucidated in detail by the Fries-Nelson school of Kantianism. What is involved is a recourse to so-called immediate knowledge, which in itself is certain—pure and sensual intuition or rational cognition whose content is expressed in mediated knowledge, that is, in true judgments. Leonard Nelson has applied this doctrine also in the sphere of practical reason; see his book, Kritik der praktischen Vernunft (Leipzig, 1917). This doctrine was subjected to a thorough analysis and criticism in the twenties, which are in the main still valid; cf. Walter Dubislav, Die friessche Lehre von der Gegründung, Darstellung und Kritik (Dönitz, 1926). Fries’s principle of the self-confidence of reason in the truth of its immediate knowledge, which claims that freedom from error is guaranteed with respect to certain assertions, is merely the expression of a psychologistic form of dogmatism.

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workable inferential procedures and for ultimate linguistic or extralinguistic authorities which may be used as a basis for inference. Here, too, the trilemma must necessarily arise: infinite regress, circularity, or that kind of dogmatism that is seen as a necessary evil—a solution one can resign oneself to accepting in view of the obvious unserviceability of both the other alternatives.

Anyone who is unwilling to rest content with the dogmatizing of statements, criteria, or other authorities of whatever kind will be obliged to ask himself whether the whole situation, which inevitably leads to the Münchhausen trilemma, may not be avoided. It is perfectly possible that the search for the Archimedean point of knowledge that dominates the thought of classical methodology arises through formulating the problem situation in a way that could not withstand criticism. One must not overlook the possibility that formulations of problems, too, can contain presuppositions that may be false and consequently misleading. The problem of the Archimedean point of knowledge may be one of the wrongly formulated problems. But before we turn to this question, let us review the various versions of classical epistemology.

3. The Revelation Model in Epistemology

Classical epistemology, which developed parallel to modern science, arose out of controversy with a tradition bearing the stamp of scholastic thought, which it sought to overcome. Nevertheless, it shares with this tradition a general way of thinking which one could call a revelation model of knowledge. Karl Popper has pointed out that the core of optimistic epistemology, which inspired the birth of modern science, consists of the doctrine that truth is manifest, that it lies open to view, and that one need merely open one’s eyes to see it.

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It may be veiled, and on occasion it may not be easy to draw aside the veil; but “as soon as the naked truth stands revealed before our eyes, we have the power to see it, to distinguish it from falsehood, and to know that it is truth.” This epistemology, found as well in thinkers of classical antiquity, was bound up, as Popper demonstrates, with an ideological theory of error: the view that error is in need of explanation, while the perception of truth is a matter of course, and that the causes of error are to be sought in the sphere of the will, of personal interest and of prejudice. Bad will disturbs, as it were, the pure process of knowledge: the seeing of truth. Personal interest and prejudice intervene and falsify the result, impair the revelation.

One can speak here with some justice of a pseudomorphosis of the methodology of critical thought, of its development in a guise determined by traditional theological modes of thought; a garb which renders intelligible the manner of coming to terms with the foundation problem outlined above. For if rational thought can link up with ultimate “givens” mediated by some kind of revelation, then a recourse to secure foundations as demanded by the above-mentioned postulate of sufficient justification seems to succeed without invoking arbitrary human choices. In cognition possessing the character of revelation, the sector of reality in question enters immediately and unmistakably into the field of vision of the knowing subject, who is, one may suppose, a passive receiver, so that there can be no question of doubt. Admittedly, the knower must acknowledge not merely the content but also the revelatory character of such cognitions: he must identify them as revelations. But should doubts once arise, the discussion about adequate criteria starts, and the interrupted foundation regress seems in principle to be capable of continuation. The illusion of an Archimedean point has disappeared.

The various versions of the revelation model are distinguished from one another primarily by the source of knowledge specified in each case, but also by the manner in which access to this source is regulated. It is especially in this last

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point that the sociological character of the epistemology concerned tends to show itself, as does the fact that these doctrines by no means manifest that philosophical purity and freedom from all empirical relations that philosophers are inclined to attribute to them. A unique supernatural revelation, historically limited to a particular circle of human beings, to which the rest of mankind, including later generations, has access only via a tradition partly written: this is a pattern for the mediation of truth that is widespread in the theology of the major religions. A revelation of this kind can take on widely varying social expressions. The intent of this model is to found a once-revealed and unchangeable truth and place it once and for all beyond the reach of all possible criticism. But, as is well known, such a fixation by no means excludes all modifications. Rather, the real problem is by this means shifted to the identification and interpretation of this revelation; that is to say, it becomes a matter of determining which of the utterances contained in the particular tradition possess a canonical character and can therefore be regarded as revelatory in content, and how they should be interpreted so that this content may emerge pure and free from distortion. At decisive points the analysis of factual questions, unrammed by dogma, is replaced by exegesis, the interpretation of pre-established texts. This interpretation is of course always selective in a certain direction and, in addition, is constructive and can consequently lead to widely differing conceptions, although

11 The method employed by the Jesuit François Veron at the beginning of the seventeenth century to combat Calvinism was based on the fact that the answers to both these questions must not as a matter of principle be regarded as a foregone conclusion; cf. Popkin, History of Scepticism, pp. 70 ff. What happened then, of course, was that his Calvinist opponents discovered the usefulness of this method for the corresponding counterargument. In modern theology, too, both questions are examined; cf. Willi Marxsen, Das Neue Testament als Buch der Kirche (Stuttgart, 1966), pp. 16 ff. and passim, a book which makes clear the extent to which the modern-day overemphasis on hermeneutical problems has forced the fundamental epistemological problems into the background. We shall return to this later.
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the fact is not always readily admitted. Thus factual problems of various sorts may be authoritatively resolved by being clothed in a hermeneutic garb by a person called to that task; and this may be done in a manner which secures such solutions as far as is possible against doubt and objections.

In such societies the institutional question regularly crops up as to which persons are qualified to provide valid interpretations. On occasion a relatively closed and hierarchically structured group, a bureaucracy of religious or ideological experts, succeeds in setting up a monopoly of interpretation. When this happens, the promulgation of particular beliefs based on revelation is combined with a claim to obedience by those occupying certain social positions—men qualified to interpret revelation who, in establishing their claims and promulgating their own forms of belief, have at their disposal sanctions of many and varied kinds, ranging from the imposition of transcendental punishments to the employment of physical force. One may regard a social and intellectual development of this kind as reaching its apogee when certain officials acquire a claim to infallibility for their interpretations, which claim becomes dogmatically fixed. This is a process that expresses the authoritarian and dogmatic character of such an epistemology in a particularly salient manner, and at the same time clearly shows that in this case epistemology and social theory are inseparably linked.

Extreme versions of the revelation model of knowledge, with their monopoly of interpretation, claim to obedience, obligatory belief and persecutions of the heterodox, serve to demonstrate most clearly the connection between epistemological problems of justification and problems involving social

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structure, morality, and politics. But such a connection is present not only in these extreme authoritarian cases but also in less dramatic ones. It would be wrong to regard epistemologies associated with religio-theological or secular-ideological positions as being “impure” special cases that could be left to ideology critique, while regarding the epistemology of the natural sciences, for example, as a “pure” doctrine free from any empirical admixture and social or political implications, imagining, perhaps, that such an epistemology can be constructed in a purely formal, semantic, or analytical manner and constituted as an autonomous discipline unconnected with any philosophy of life, as a pure theory of science. I do not wish to deny that one can proceed thus in certain circumstances; nor is it disputed that such a procedure may nowadays expect to meet with applause. But that an epistemology of this kind can then be relevant to the solution of important problems may legitimately be doubted. On the contrary, it must here be stated right away, first, that epistemology and critique of ideology are closely connected, that neither can be “neutral”—any more than can moral philosophy—without becoming irrelevant to its own peculiar problems; and second, that over and above this they have a connection with sociopolitical problems that cannot be set aside without reducing their significance. This is also true of solutions that employ the revelation model in a less drastic manner, or that even operate with a genuine alternative to this model in which the principle of sufficient justification no longer plays a part. Let us leave this point for the time being and concentrate for the present

12 On the interpretative techniques in use in the Christian world, see above all the critical analysis, so far insufficiently noticed by theologians, in Walter Kaufmann’s Critique of Religion and Philosophy (New York, 1958), chapter 6, as well as chapters 5 to 10 of his The Faith of a Heretic (New York, 1960). See also Bartleby’s Retreat to Commitment.

13 It is hardly necessary to mention that revelation claims arise also in connection with nonreligious convictions.

14 In his essay, “The Nature of Philosophical Problems and Their Roots in Science” (1952), reprinted in Conjectures and Refutations, pp. 66 ff., Karl Popper has emphasized that the “purification” of philosophy and its detachment from the cosmological, mathematical, political, social, and religious problems in which it is rooted is a sign of degeneracy, which has the effect of causing interesting problems simply to disappear altogether.

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on the fact that the revelation model affords, in the first instance, an apparently plausible solution to the problem of the Archimedean point of knowledge, a solution that varies according to the source of knowledge preferred in the relevant epistemologies and then develops into various conceptions of rationality.

Modern philosophy has certainly not emancipated itself from this theological model, which to a considerable extent has focused the process of knowing upon the interpretation of given statements endowed with authority, a process in which error comes close to sin, while knowledge assumes the character of grace. Classical epistemology, which developed alongside modern science, also operated with a revelation theory of truth; a theory in which revelation was naturalized and democratized, i.e., divested of its supernatural and at the same time of its historical character and transposed to individual intuition or individual perception. This was paralleled by the Reformation emphasis on individual conscience with regard to certain moral and political decisions, an emphasis typical of the Protestant tradition then in the process of formation.

In this way the epistemological privileges hitherto granted in Christian doctrine to the holders of certain social positions, at least where important problems were involved, were fundamentally questioned, and a doctrine of knowledge was created which had to come into collision with the official teaching of the Catholic church, as it in fact has again and again up to the present day. In the Protestant sphere the removal of the central authority and its monopoly of interpretation, and the attachment of faith to the Bible, led to a multiplicity of competing interpretations and to attempts to adapt theology to the modern sciences, which appeared to render the core of Christian belief at least partially immune to critical objections from that source. The hermeneutic philosophy which then developed in this sphere has produced a style of thought that not only approaches that of the theologians, but in addition has made it possible to render epistemological assistance to theological thought, as we shall see later.

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With respect to the widespread view that the Protestant emphasis on the Bible and the individual conscience has had a direct liberating effect upon society, it is necessary nowadays to have serious misgivings. The Reformation and the Counter-Reformation led, in the first instance, to an interruption of the development toward freedom of thought and toleration initiated by the Renaissance; to the suppression of the Erasmian tendencies that had been spreading vigorously until then; and to a fanaticizing of the masses. As a result, more liberal ideas could only reassert themselves after a long intervening period filled with religious struggles, witch trials, and heretic hunting.16 The ideas of the Enlightenment met with resistance not only from Catholic but also from Protestant orthodoxy. The conscience, formed by the influence of the cultural milieu existing at any given time, can function, as has been seen, in a thoroughly authoritarian and dogmatic fashion;17 and the Bible can be read in a way that confirms this, even when the Catholic monopoly of interpretation has been broken.18 But

16 Cf. H. R. Trevor-Roper, "Religion, the Reformation and Social Change," in his volume of the same name (London/Melbourne/Toronto, 1967), which is primarily concerned with subjecting the Weber-Tawney thesis of the connection between Calvinism and capitalism; see also his essay, "The Religious Origins of the Enlightenment," in the same volume, in which the thesis of the positive influence of Calvinism on science and philosophy is corrected; and finally, his thorough analysis of the witch craze that increased at the time of the Reformation and Counter-Reformation, "The European Witch-Craze of the Sixteenth and Seventeenth Centuries," also in the same volume.

17 Incidentally, freedom of conscience was kept within very narrow limits especially in the Lutheran world; moreover, politically speaking, it was combined with an authoritarian mode of thought with extraordinarily important consequences; cf., e.g., Karl Kupisch, "Protestantismus und Zeitverständnis. Politische Aspekte der Reformation," Blätter für deutsche und internationale Politik, vol. 12, no. 4 (1967), pp. 355 ff.

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let us turn our attention once more to the philosophy of knowledge, which is not immediately tied to the theological doctrines of the churches.

The naturalizing and democratizing of the idea of revelation in classical epistemology detached knowledge from its traditional connections and made it into a revelation of nature by means of reason or the senses. Within the realm for which this doctrine claimed to be valid, it was no longer possible to legitimate cognitions by appealing to texts invested with authority; instead, one had recourse to intellectual intuition or sense perceptions. That means, however, only that one authority had been replaced by others of similar dogmatic function, while the authoritarian scheme of justification was still, in the end, retained: knowledge is justified through recourse to some absolutely certain authority.19 Truth was now accessible to anyone who used his reason or his senses in the correct manner; but at the same time the idea of a guarantee of truth, the image of a certain knowledge, initially still often based upon theological considerations, was retained.

4. CLASSICAL EPISTEMOLOGY: INTELLECTUALISM AND EMPIRICISM

In the classical phase of modern philosophy we find two versions of the revelation model of rationality:

a. classical intellectualism which took as its starting point the sovereignty of reason, of intellectual intuition, and the primacy of theoretical knowledge, and

b. classical empiricism, which emphasized the sovereignty of observation, of sense perception, and the primacy of facts.

We find classical intellectualism clearly expressed in Descartes, who was willing to concede as valid for the unmediated

knowledge of objects only clear and evident intuition, and by this, as he clearly states, he means,

not the manifold and changing testimony of the senses or the deceptive judgment that bases itself upon the confused images of sensual perception, . . ., but the simple and distinctive apprehension of the pure and attentive spirit, so that no further doubt remains about what has been perceived, or, what amounts to the same thing, the apprehension, superior to all doubt, of a pure and attentive spirit, springing solely from the light of reason.20

He goes on to speak of the self-evidence and certainty of intuition, and then moves to the procedure he acknowledges as a method for attaining to mediate knowledge, namely, deduction, by the aid of which all those things may be affirmed “which may be necessarily deduced from other particular things known with certainty.” According to his view, deduction must be introduced “because after all, one has certain knowledge of most things, even if they are not evident by themselves, provided they are deduced from true and clearly recognized principles by means of a continuous, uninterrupted movement of thought intuitively producing each single stage of the process.” Thus, through intuition we have immediate access to the truth and, in particular, we have immediate access to general truths, to those principles from which we may deduce further knowledge. Thus the intuitive apprehension of particular “givens” is supplemented by deduction as a procedure of derivation. Basically, all truth is attainable through the joint action of self-evident intuition and necessary deduction. For Descartes there is no other way to the certain cognition of truth. Moreover, clarity and distinctness are assumed very early to be criteria of truth.21 For him, the goal of the scientific process consists in making true and well-founded judgments and thus

19 Cf. Popper's above-mentioned essay, "On the Sources of Knowledge and Ignorance."


penetrating to secure and certain knowledge. The connection very quickly becomes obvious between the idea of sufficient justification, which leads him to propose the combining of the two procedures of intuition and deduction, and the demand for certainty, which dominates his search for truth. His methodical doubt aims exclusively at cleansing the intellect from all prejudice in order to advance to a secure basis for knowledge, to an Archimedean point from which will be generated the first and fundamental certainty for the whole process of knowing.

We encounter classical empiricism in Bacon, although in a form less significant for the actual development of the scientific method than for the ideology of science. In his view, it is only through sense perception that one has direct access to reality and thus to truth—that is, access to the concrete facts from which, if one wishes to proceed with assurance, one can climb higher only gradually and by stages, attaining to the most general principles only at the very end. The inadequacies of sense perception are perfectly plain to him, but he believes he can satisfactorily compensate for them by means of instruments and experiments. Sense perception that is improved in this way can serve as a basis for all further cognitive operations. To be sure, in order to achieve certainty with the aid of sense perception, one must first of all purge the intellect of all prejudices. This demand subordinates all theoretical anticipations of the results of later investigations to the verdict of an empiricism oriented toward immediately apprehensible facts. All such anticipations on the part of the intellect are to be dispensed with in favor of an interpretation of nature that does not rest content with assumptions and probabilities, but demands the security of certain knowledge. Bacon postulated induction as the process by which indirect knowledge might be gained; by its aid one could, starting from the results of observation, climb up "a correct, steadily rising ladder first of all to the lowest principles, then to the middle ones and only at the very end to the most general." Induction is thus added to the observation of the particular data as an inferential procedure. Through the cooperation of certain observation, attained under some circumstances by experimental methods, and of step-by-step (and therefore certain) induction, all truth would finally be attainable. The goal, as in Descartes, consists in making true and well-founded judgments and thus achieving secure and certain knowledge. In Bacon, too, one can observe a connection between the idea of sufficient justification, which doubtless lies behind his proposed combination of observation and induction, and the longing for certainty, which characterizes his epistemological ideal.

It has been rightly pointed out that there are basic similarities between the Cartesian and the Baconian method, similarities above all in the fact that in both cases the intellect must be purged of prejudices in order to attain to evident truth, to a certain basis for knowledge—be it rational intuitions or sense perceptions—from which everything else may


24 Ibid., sections 30, 69.

25 Ibid., section 68: "So much concerning the several classes of idols, and their equipage; all of which must be renounced and put away with a fixed and solemn determination, and the understanding thoroughly freed and cleansed; the entrance into the kingdom of man, founded on the sciences, being not much other than the entrance into the kingdom of heaven, where into none may enter except as a little child."
be inferred by deductive or inductive procedures. According to this view, Bacon and Descartes were unable to keep their epistemologies free from authoritarian traits, since they only succeeded in replacing existing authorities with new ones, those of the senses or the intellect. Both versions of classical epistemology have in common the idea of an immediate access to truth through self-evident intellectual insight or careful observation. Truths of some sort are “given” to knowledge and must therefore be accepted. Obviously, in this conception a view of the sources of cognition is linked with a criterion of validity so that the problems of origin and justification are solved at one and the same time. Derivation from reason or perception is regarded as decisive for the legitimation of knowledge. Such a derivation appears to provide knowledge with a guarantee of truth and thus to give it the requisite certainty; for one must be able to have recourse to some secure basis, some unshakable foundation, in order to justify everything. In the origins of knowledge, truth and certainty hang together and both are transmitted by the preferred inferential process to all other knowledge. Thus, as one may see, the Münchhausen trilemma outlined above is resolved by the third alternative: breaking-off of the foundation regresses at a particular point by recourse to convictions that bear the stamp of truth and must therefore be believed—beliefs that are un- touchable because they are legitimized by the new authorities. Since it is always possible to have recourse to self-evident “givens” revealed to the percipient through reason or sense perception, error can only be rendered comprehensible by attribution to some active intervention.

Descartes and Bacon are not the only representatives of classical epistemology who can be subjected to critical investigation. Both the intellectualist and the empiricist alternatives were developed further, and during the course of this development the various difficulties inherent in these positions emerged and prompted remedial efforts. The conventionalism of Pierre Duhem and other theorists of science could be regarded as a modern version of intellectualism, and the positivism of Ernst Mach and the members of the Vienna Circle as a modern version of empiricism. It can hardly be doubted that the teachings of the early as well as of the later representatives of classical epistemology made many advances, and it is impossible to do full justice to these advances in a short space. But on the basis of the foregoing sketch of the Baconian and Cartesian positions, one can discuss the essential problems that must arise in epistemologies of this kind—those, that is to say, that are unwilling to sacrifice the principle of sufficient justification and consequently retreat to a revelation model in order to render comprehensible the certainty of the ultimate “givens” that provide the basis of knowledge.

The intellectualist version of classical epistemology overestimates speculation, as is revealed above all by the fact that it seeks to emancipate itself in large measure from the supervisory control of experience. It seeks certainty through pure rational insight; but derivation from reason hardly suffices as a guarantee of truth. Many an intuitive insight has, in the course of scientific development, later turned out to be false, although it previously appeared self-evident. This is always possible where theoretical assertions are concerned because one may succeed in deriving from them contradictory statements, or else conclusions that prove untenable when subjected to the test of empirical procedures. Intuitive certainty turns out to be valueless in such a case. And when this has once proved to be the case, it is advisable to abandon its use as a criterion, for such a situation may recur at any time. Psychologically speaking, there appears to be a close connection between intuition and habit. Intuitive insights bear the stamp of certainty above all because they tend to correspond with our habits of thought. But our habits of thought are,
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as we know, by no means sacrosanct; in any case, we should not treat them as such, for they are frequently resistant to fruitful theoretical innovations. The hypotheses that bring about scientific progress frequently have a counterintuitive character.30 One need only recall the obstacles that, on various occasions in the history of the modern sciences, have impeded the acceptance of revolutionary theories—of theories, that is, which forced people to revise deeply rooted habits of thought. One of the latest examples of this is Einstein's theory of relativity. If one wishes to protect one's convictions against risks of this kind, this may certainly be done, but it is mostly at the cost of their content and explanatory force, consequences that not everyone is prepared to accept. We certainly tend intuitively to maintain our old prejudices against innovations of all kinds. It is not necessary to encourage such an attitude by according it the status of a theory of science.31

Deduction, the procedure of inference preferred by classical intellectualism, is relatively unproblematical; but one thing we know about it is that it only allows logical transformations in which the information content of the respective statements is not increased,32 so that, for example, from principles that are relatively lacking in content—possibly even analytical—

Bertrand Russell, "Mysticism and Logic" (1914), in Mysticism and Logic and Other Essays (Penguin Books, 1953), pp. 9 ff.; especially pp. 18 ff., where intuition is characterized as an aspect and development of instinct that can go grievously astray in unfamiliar situations. Russell at that time seems to have attached no importance to the distinction between instinct and habit. See also Herbert Feigl, "Validation and Vindication: An Analysis of the Nature and Limits of Ethical Arguments," in Readings in Ethical Theory, ed. W. Sellars and J. Hoppers (New York, 1952), p. 673; and also Mario Bunge, Intuition and Science (Englewood Cliffs, N.J., 1962).


32 Cf. section 2 above.

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no conclusions possessing high information content may be inferred. Truths of reason, the negations of which are contradictory, and insights into essences that take the form of definitions are not able to lead to conclusions that are useful for the explanation of real relationships. Incidentally, for logic itself, for the discipline, that is to say, in which the deductive procedures employed in cognition are codified, it is of course also possible to raise the problem of foundation,33 although the fact that logic makes no claim for material knowledge appears to make the solution of the problem easier.

The theories that are of interest for the interpretation of reality are, contrary to what the classical doctrine suggests, not revelations of reason but rather inventions, constructions—in other words, products of the imagination, no matter whether they are collections of true or false statements, or whether they possess greater or lesser truth content. Theory formation is a creative activity, not a passive contemplation mirroring "givens." But for that very reason, constant criticism and checks are necessary in order to eliminate errors of theoretical thought. Revelations may suggest their own certainty; constructs, on the other hand, make no claim to be final or unrevisable.

The empiricist version of classical epistemology underestimates speculation. This is particularly evident in the way in which it tends fundamentally to replace speculation with inductive inferences from the results of accurate observation. Only through sense perception, the empiricist claims, is immediate access to reality, and thus to certainty, possible.

Theories are considered valueless if not based upon sense perception, inductively derived from perceptual data. But, as Hume recognized long ago, this process of inference—induc-
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tion—is a fiction.34 Let us assume for the moment that the experiential basis of induction is present and unproblematical and that we have at our disposal a set of serviceable singular propositions expressing the results of empirical observation. To move from this starting point to general laws by an inductive process would require a principle of induction to permit such inferences, for deductive logic, as is well known, can do no such thing. Since such a principle cannot be analytic and cannot emerge in the form of a rule from an analytical statement, it must have a synthetic character; but if one demands an inductive foundation for every synthetic statement, this leads to an insoluble problem.35 At this point in the process of grounding the principle of induction, we fall into the previously outlined Münchhausen trilemma, so that the only practicable possibility is to break off the process at a particular point. But that involves an a priori attitude incompatible with the empiricist position; and it makes no difference whether one is disposed to fall back on deductive or inductive methods in order to justify the principle. One cannot base theories upon observation without a principle of induction because such theories always go beyond existing observations, in that they exclude certain states of affairs for all possible spatio-temporal areas;36 and they do this in such a way as to involve counterfactual conditionals. Thus they transcend all immediate experiences and their linguistic correlates. For that very reason they are able to explain observable facts and even lead to the prediction of hitherto unknown facts. Indeed, successful theory building can even have a counterinductive character; that is to say, it can lead to theoretical statements that call into question prior observations,37 reveal them as mistakes, or show their formulation to be the result of misinterpretation.

35 Karl Popper has demonstrated in chapter 1 of his Logic of Scientific Discovery that this problem leads to a dilemma between an infinite regress and apriorism.
36 Cf. Logic of Scientific Discovery, chapters 3 and 4, and appendix 10.
37 Cf. Karl R. Popper, “Die Zielsetzung der Erfahrungswissenschaft,” in

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Thus, we come to the so-called factual basis of induction, the alleged certainty of which is supposed to show its suitability to be the basis for the justification of theories. That derivation from sense perception can afford no guarantee of truth is demonstrated by the fact that theories based upon such perceptions have again and again proved false. Occasionally it is even possible to demonstrate contradictions between observation statements made by one and the same person,38 and it is well known that different observers can come to differing conclusions. Furthermore, perceptions themselves tend to a great degree to be theory-determined and theory-directed.39 This means, among other things, that under the influence of prevailing theories, observational habits and predispositions can be formed that favor the production of observational results that support those theories—a possibility to which we shall return.40 Moreover, it is by no means necessary for this effect that the theoretical elements involved should be dominant in our consciousness.41 It is precisely the

39 We know today from psychological research that perception depends on its context and that cognitive factors are also part of the context—factors that are customarily referred to as “set,” “expectancy,” “hypotheses,” etc. Cf., e.g., William N. Dember, The Psychology of Perception (New York/Chicago/San Francisco/Toronto/London, 1960), pp. 271 ff. and passim. The familiar Whorf hypothesis about the influence of the linguistic framework may be regarded, as Dember states, as a special case of the more general thesis concerning the relationship of set and perception; see pp. 290 ff. For an analysis of the epistemological significance of such facts, see Alfred Bohm, “Zur Kritik des modernen Empirismus. Beobachtungssprache, Beobachtungstatsachen und Theorien,” Ratio, vol. 11 (1969), reprinted in the 2d ed. of Hans Albert (ed.), Theorie und Realität (Tübingen, 1972).
40 Cf. int. al., Thomas S. Kuhn, The Structure of Scientific Revolution (Chicago, 1962), passim.
41 The fact that in our perception we always operate implicitly with “as-
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person who is at pains, in the manner of classical inductivism, to construct a theory-free basis of observation in order to later inductively formulate theories who will not infrequently make observations confirming his implicit prejudices. Observations and the statements resulting from them are not merely invariably selective: they contain as well an interpretation corresponding to more or less explicit theoretical points of view. Such points of view must be developed and elaborated if one wishes to assess the relevance of the observations, to devise interesting experiments, or to produce observations that run counter to theory. Observation, measurement, and experiment are without doubt important elements of the scientific process, but not as a means of providing a firm basis for the inductive acquisition and founding of theories, as sources of guaranteed truth. Rather, they are means for criticizing and thus running a check on theoretical conceptions.

assumptions is shown very clearly when we look at pictures that are constructed so that the assumptions mobilized by their components contradict one another; cf. E. H. Gombrich, "Illusion and Visual Deadlock," in his volume of essays, Meditations on a Hobby Horse and Other Essays on the Theory of Art (London, 1963); see also idem, Art and Illusion: A Study in the Psychology of Pictorial Representation, 2d ed. (New York, 1961), in which a theory of art is developed that takes account of modern psychology of perception and has interesting consequences for art history.

It is well known that at the same time that the modern natural sciences were being constructed, a systematic demonology developed that had an inductive foundation and was in fact widely regarded as a genuine science; cf. Trevor-Roper, "The European Witch-Craze," in which he shows that this "theory" played a part in the manufacture of the proof supporting it, with the result that an effective refutation appears extraordinarily difficult; see also Paul K. Feyerabend, Knowledge without Foundations (Oberlin, Ohio, 1961), pp. 20 ff.

5. Overcoming Dogmatism: The Principle of Critical Examination

Classical methodology, as expressed in the epistemology of classical rationalism in both its intellectualist and empiricist variants, as we have seen, was based upon a methodological version of the principle of sufficient reason—on the idea, that is, that every view, every conviction, every belief must be justified through reference to positive, certain grounds, to an unshakable foundation. In order to avoid circularity or infinite regress, however, it was necessary to fall back upon some kind of ultimate and indubitable "givens," the certainty of which can best be made plausible by invoking their revelatory character. The process of justification must find its dogmatic conclusion in something indubitable. There the difficulty immediately arises that precisely this fundamental methodological postulate of the classical theory justifies calling into question any hitherto-attained Archimedean point, and with it the basis of the whole procedure.\(^1\) It does not help to refer to the revelatory character of certain insights; for the investigator must in the end simply decide whether he is prepared to acknowledge certain presumed insights as revelations. Whether it concerns divine, supernatural evidence, or natural revelations

\(^1\) See William Warren Bartley III's *The Retreat to Commitment*, which analyzes the problem of the foundation regress. See also Franz Kröner, *Die Anarchie der philosophischen Systeme* (Leipzig, 1929), which I did not see until after completing the manuscript for the present book. In his book Kröner carries out a systematic investigation concerning the problems of philosophical pluralism, the incompleteness of philosophical systems, and the foundation of such systems. In so doing he reduces *ad absurdum* the fiction of a secure basis and the claim to completeness found in many philosophical conceptions.