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THE METHODS OF
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INTRODUCTION

1. TERMINOLOGY

In order to give a clear account of contemporary methodological theories we require a terminology with precisely established meanings. For this reason it will be necessary to preface the discussion proper with some terminological definitions. The purpose of this is not to establish any theoretical principles but to obtain rules for using certain words and phrases; these rules will often take the form of propositions which could also be used to make assertions about things: but here all that matters is the way in which the terms in question will be used in this book.

On the whole, our terminology forms part of the common usage of philosophers; certain expressions, however, are used in different ways by different thinkers. In such cases it has been necessary to choose a single meaning, and in this sense what we are about to say is conventional: that such and such an expression is to be used in such and such a way.

Ontological Terminology

The world is made up of *things* (elements, substances), such as mountains, plants, men, etc., which are characterized by various *properties* – e.g. colours, shapes, dispositions, etc. – and linked one with another by a variety of relations. The general philosophical name for everything which is or can be is “being” (*Seiendes*); even such things as properties and relationships will thus be called “beings”. It is possible to distinguish two aspects in every being: *what* it is – its nature, its “whatness”, its essence – and the aspect which consists in the fact *that* the being is – its *Dasein*, its existence.

If a being is modified in some way – e.g. if a thing is red, or a geometrical figure has twice the area of another – we are confronted with a state of affairs. States of affairs are not independent of one another. On

the contrary, it often happens that *if* one state of affairs is the case, *then* another is also the case. The world may be thought of as an inter-related pattern of states of affairs. Indeed it is itself a colossal and extremely complicated state of affairs, in which everything that is or can be is connected with everything else in an endless network of relationships. Of course this is not to say that it would not be possible to use more or fewer categories. In fact it has been asserted in the history of philosophy that, for example, there are no things but only properties or relations; other thinkers have taught that there is only one thing. There are also some thinkers who, on the contrary, trace everything back not to a *one* but to a *many*. The list of such theories could easily be extended.

From the methodological standpoint, however, these discussions are of slight importance. Perhaps a deeper analysis would permit us to accept one of these fundamental points of view. But in the practical business of knowledge all the categories mentioned are constantly used. And it is a striking fact that we find far-reaching agreement with respect to these categories among the leading thinkers of Western culture: Plato, Aristotle, Plotinus, St. Augustine, St. Thomas, Spinoza, Leibniz, Kant, Hegel, Husserl, Whitehead all use a language in which the names of our categories occur, whatever may be their understanding of the world in itself.

Psychological Terminology

Methodology is concerned with knowledge. What knowledge is, however, is a difficult and much disputed question. The sense which is to be given to this term must now therefore be specified.

(1) Knowledge is taken to be something *mental*, something which is to be found in the mind and only there: knowledge is here limited to *human* knowledge. Further it is considered not in the sense of an act or a process, but rather of a *condition*, or more precisely a *state*. Knowledge is that in virtue of which a man can be called a “knower” – just as bravery is that in virtue of which he is called “brave”, and strength that in virtue of which we say of a bull or a motor that it is “strong”. From this it follows that there is no such thing as knowledge “in itself” or knowledge apart from the mind of some human being; all knowledge is the knowledge of individual men.

There is admittedly much talk in present-day philosophy about supra-individual knowledge. But this usage comes about either because the *object* of knowledge is thought of, or because of the metaphysical presupposition of a collective subject, such as the Hegelian objective spirit. For methodological purposes it is convenient to make a distinction between knowledge as mental phenomenon and the content of that knowledge, and the metaphysical (and incidentally very questionable) thesis referred to is therefore quite insignificant, since ultimately method can be applied only by an individual, and not by such an allegedly objective spirit.

(2) Knowledge always has an object: that which is known. And this object is always a state of affairs. A thing or a property or a relation cannot be known, strictly speaking: if anything is known, it is always that the thing or property or relation in question occurs in a certain way in a state of affairs.

(3) The object is, as it were, *pictured* in knowledge. Things, properties and relations are represented in this way by means of *concepts*, states of affairs by means of *propositions*. It follows from what has just been said that a concept is not sufficient for knowledge: knowledge refers to states of affairs, and these are represented first of all by means of propositions. Propositions, then, are the first requirement for knowledge.

(4) The representations referred to can be considered either subjectively or objectively. Subjectively considered, they are to be taken as mental *patterns*, which constitute a part of the human mind; seen objectively it is a question of their *content*, what is represented by these patterns. This content might be thought to be something real, a being, namely the being which is known. But this is not the case. To show this it is enough to point out that there are also false propositions – and such propositions obviously have a content, they are not merely mental patterns, and yet they are not representations of the real world.

The expressions “concept” and “proposition” are thus ambiguous: a distinction must be made between the *subjective concept* and the *subjective proposition* – which are mental patterns – and the *objective concept* and the *objective proposition* – which are not mental patterns but the contents of the corresponding subjective concepts or propositions.

(5) All cognition comes about through a mental process; the result of this process is knowledge. This process is not a state but an *activity* of the subject. Here it will be called *the acquisition of knowledge (Erkennen)*.

The acquisition of knowledge, like knowledge itself, is something mental, something attaching to the individual person. As opposed to objective concepts and propositions, however, there is no such thing as “the objective acquisition of knowledge”; this would be an absurdity.

The acquisition of knowledge in the full sense culminates in a *judgement*, by which an objective proposition is asserted (or denied). The corresponding “lower” process of cognition, which leads to the formation of the subjective concept and to the conceiving of the objective concept, will be called “concept formation”.

In fact both acts are closely connected in the process of cognition; both have a very complicated structure which will not be discussed further here. It may be noted that some thinkers (such as the scholastics and Kant) use the word “judgement” in the sense given to the word “proposition” in this book. But in our terminology a judgement is always a process, whereas a proposition is an objective pattern.

(6) It is necessary to distinguish between the acquisition of knowledge and *thinking*. The expression “thinking” will be given a wider connotation: it is to be taken as meaning a mental or intellectual movement from one object to another. Such a movement need not necessarily be an acquisition of knowledge. It is possible, for example, to think in such a way as to remember different things one after another in a moment of leisure. The acquisition of knowledge would then be conceived as *serious thinking*, as the kind of thinking which is intent on knowledge.

Semiotic Terminology

In order to communicate our concepts and propositions to others, and to make our own thinking easier, we use *signs*, above all a written or oral *language*, consisting of words or similar symbols. The two following facts are important in this connection:

(1) Language does not represent things directly, but rather objective concepts and objective propositions. We do not say how things are, but rather how we think of them. This is a very important observation, the failure to take account of which may lead to serious errors.

(2) Language does not always represent objective concepts and propositions adequately. It frequently happens that a linguistic sign represents several objective forms (ambiguity) or that several signs represent the same form (synonymy).

There is a natural and perfectly justified tendency to develop language so that it shall represent objective concepts and propositions as adequately as possible. But this remains an ideal that is seldom achieved. Since language plays an overwhelmingly important part in the acquisition of human knowledge (if only for the reason that this knowledge is socially conditioned, that is, becomes known through what has been discovered by other men, and by means of language), linguistic analysis, the interpretation of language, is one of the most important items in the method of cognition.

A sign for an objective concept will be called a "name" and a sign for an objective proposition a "statement". This leads to the following table, which summarizes our terminology:

Domain of the real:	being	state of affairs
Processes of cognition:	concept formation	judgement
Objective forms:	objective concept	objective proposition
Subjective forms:	subjective concept	subjective proposition
Language:	name	statement

This is, needless to say, merely a provisional guide which will be amplified below.

Terminology of the Theory of Knowledge

An objective proposition – and therefore also a subjective proposition and a meaningful statement – is always either *true* or *false*. The meaning of these expressions is defined provisionally as follows: a proposition is true just when it comes true, that is, when the corresponding state of affairs is the case. It is false just when it does not come true, that is, when the corresponding state of affairs is not the case. The term "truth" will therefore be taken to mean "the property of a proposition or statement which consists in the fact that the corresponding state of affairs is the case". The meaning of the term "falsity" can be defined analogously.

This is, needless to say, only one of the very numerous meanings of the term "truth", since it has not only, for example, in the language of the art critics, at least a dozen different meanings, but even in logic itself

it is used in several senses. In addition many philosophers give the term different, more or less legitimate (i.e. expedient) meanings.

The meaning given has been chosen, however, firstly because this one occurs in every science even though it may be accompanied by others, and secondly because it seems that all other definitions presuppose it in some way. If it is said, for example, that a proposition is true when it speaks to the human condition of the person who receives it, then on a higher level the question is: is it *true* that this proposition speaks to the human condition etc.? And here "true" can obviously only have the above meaning. If someone were to maintain that every truth is relative (that is, were to ascribe to the term a quite different meaning from ours) then one would have to ask in *our* sense: is that true?

However that may be, this much seems certain, that every science strives to establish true statements (in the above sense): that is the ultimate aim of the acquisition of scientific knowledge. This is naturally not to say that such a goal is always attained, nor that it is even attainable in every domain; but the tendency towards this goal clearly determines every acquisition of knowledge and therefore the meaning of "truth" adopted here is fundamental for methodology.

This goal can be reached in two different ways: (1) by inspecting the state of affairs (literally or mentally): if one wishes to know, for example, whether the proposition "This table is brown" is true, it is enough to look at the table; this will be called the *direct* acquisition of knowledge; (2) by inspecting, not the state of affairs in question, but other states of affairs, and drawing conclusions from them about the first. This will be called the *indirect* acquisition of knowledge. It should be noted that every interpretation of signs is a form of indirect acquisition of knowledge: on the one hand we see material signs (such as small ink marks), on the other hand we see (mentally) certain general connections between such signs and states of affairs. From this we draw conclusions as to the meaning of the signs in the particular concrete case.

Admittedly the phenomenon of the indirect acquisition of knowledge is very curious – it is not easy at first to see how knowledge can possibly be acquired in this way. But it is beyond all question that we do come to know many things indirectly, and that there appears to be an admixture of the indirect in every acquisition of knowledge. The nature of

the indirect acquisition of knowledge is also very problematical. Here, however, we are concerned exclusively with methodology, so that we shall not consider these problems further, but merely presuppose the fact that such a process does take place.

2. LOGIC, METHODOLOGY AND SCIENCE

For an understanding of methodological theories a short account of the place of methodology in the system of the sciences is necessary. For this purpose we must deal briefly with the concepts of logic – of which methodology is a part – and of science.

Logic

There are few terms even in the technical language of philosophy which are as ambiguous as the term "logic". Disregarding all the meanings which have nothing to do with inference, there still remains an ambiguity, or, more precisely, a tripartite division of the domain covered by this term. Logic, as the science of inference, comprises three disciplines which should be kept sharply distinct.

(1) *Formal Logic*. Formal logic deals with the so-called laws of logic, i.e. propositions according to which one must make inferences if one wishes to proceed from true propositions to true propositions. The nature of formal logic again poses difficult problems, but it is easy to show by a few examples what it is concerned with. Such an example is the well-known *modus ponendo ponens*: "If *A*, then *B*; *A*, therefore *B*." This is a law of logic. Whatever statements are substituted for the letters "*A*" and "*B*", the whole statement will be true – in other words from a true statement we can derive, by means of this law, another true statement. Another example is the syllogism (in the mood *Barbara*): "If all *M* are *P* and all *S* are *M*, then all *S* are *P*." Formal logic is concerned with such logical laws, their formulation and organization, the methods of their verification, etc.

(2) *Methodology*. One might think that formal logic would suffice for the analysis of the indirect acquisition of knowledge. And yet this is not the case. In the course of scientific research it becomes clear that the same laws of logic can be applied in different ways. A law of logic is one thing, an inference drawn in accordance with such a law quite

another. Thus, for example, the well-known division of methods of thought into deductive and inductive consists fundamentally not in the use of different laws of logic but in a different use of the same laws. Methodology is precisely the theory of the application of the laws of logic to various fields.

(3) *Philosophy of Logic*. Finally it is possible to ask various questions about logic itself and the nature of its laws. What is it all about? Linguistic forms, mental processes, objective structures or even states of affairs? What exactly is a law of logic? How do we know that it is true? And is it possible to speak of truth in this connection at all? Are the laws of logic valid "in themselves" or are they merely assumptions? – Furthermore, the laws of logic often contain the expression "for all". What does this really mean? Is there anything altogether general? If there is, where is it to be found? In the mental, in the objective, in the real – or perhaps only in the linguistic realm? Such and similar questions obviously belong neither to formal logic nor to methodology: they form the subject-matter of the philosophy of logic.

The most important thing is to maintain a strict separation between the three fields. Much mischief has been caused by their not having been kept sufficiently apart.

Methodology

We have called the second part of logic "methodology". The word comes from the Greek words "*μετά*" – "along" – and "*ὁδός*" – "way". So that it means literally "a *λόγος*", that is "a speaking of the (right) going-along-the-way". The method is the manner of proceeding in any particular field, that is of organizing activity and of coordinating its objectives. Methodology is the theory of method.

There can be a methodology for every field: there is for example a chemical, a didactic, an ascetic and many other methodologies. They can be divided into two classes: those which discuss respectively the techniques of physical and of intellectual activity. Only the second kind interests us here – although it should be observed in this connection that the methodology of scientific research also includes instructions for physical activities in some fields, e.g. archaeology, chemistry, anatomy etc.

In the domain of intellectual activity it is again possible to distinguish

between various classes of method. We are concerned here exclusively with *methods of thought*, that is with directions for correct thinking. The methodology in question, i.e. the science of correct thinking, obviously relates to serious thinking, that is to the acquisition of knowledge. But not all methods of serious thought will concern us here. We shall leave out of account the methods of so-called practical thought, for example of the theory of management, or strategy, and confine ourselves to *theoretical* thought. The difference between the two lies in the fact that practical thought always refers directly to something which the thinker can *do*: the intention is admittedly to achieve a piece of knowledge, but only the knowledge of *how* this or that can be done. Theoretical thought, on the contrary, has no such intentions: it refers exclusively to states of affairs which it wishes to comprehend, quite apart from whether or not these facts can in any way be turned to account.

There are special methods for every sphere of theoretical thought and therefore special methodologies as well. These will sometimes be dealt with within the body of science. But there is also a *general methodology* of theoretical thought: it deals with methods which find application either in all theoretical thinking or at least in a large proportion of the sciences. This and only this methodology is a part of logic – and it alone will be treated here. It is the general methodology of scientific thought.

Science

The word “science” has, among others, two closely coordinated but different meanings: it can be understood either in a subjective or in an objective sense.

(1) Understood subjectively science is nothing but *systematic knowledge*. It is (a) a kind of knowledge, and therefore a quality of the human – and what is more of the individual – subject. A person who has mastered science has the *ability* to understand much of what is covered by it and to carry out correctly the (intellectual) activities belonging to this field. Thus, for example, a person who has mastered arithmetic is able to understand the laws of arithmetic and to perform arithmetical calculations correctly. Science in this sense is nothing but such an ability – and it is of course bound up with real knowledge, i.e. in our example with the knowledge of many laws. Moreover, science in this subjective

sense is (b) *systematic knowledge*. It is not the case that everybody who knows something about a particular field has mastered the science in question, but only the person who has investigated the field systematically, and who knows, over and above the individual states of affairs, how they hang together.

One sometimes speaks of scientific activities, for example of research. Such activities are called “scientific” because their aim consists in the formation or development of science in the subjective sense. So that anyone who does research, or studies, etc., is making an effort to acquire systematic knowledge.

(2) Understood objectively science is not a kind of knowledge but rather a structure of objective propositions. In this sense one says, for example, “Mathematics teaches”, or “We borrow from astronomy the proposition . . .” etc. Science thus understood obviously does not exist “in itself” – but it is also not restricted to an individual person. It is rather a social entity, in that it consists of the thinking of a number of persons – none of whom, very often, knows all the propositions belonging to it. Science understood in this objective sense has the following characteristics:

(a) It is a *systematically organized* structure of objective propositions – corresponding to the systematic character of science in the subjective sense.

(b) Not all the propositions belonging to its field belong to a science, but only those which are *known* by at least one person. Or to put it more exactly: apart from propositions which are known there are no real propositions, but only possible ones. Science consists not of possible propositions, but of propositions which have actually been formulated. It is thus possible to speak of the development and progress of science. This comes about through man’s perceiving new states of affairs and formulating new propositions in accordance with them.

(c) Science is, as we have said, a *social* undertaking. Therefore only such propositions pertain to it as have been objectivized in some way, i.e. represented by signs, so that they are at any rate in principle accessible to other people. One might admittedly also conceive of an individual science developed by a single person and known only to him; he would not need to represent it in signs. But in fact there is no such science.

Science and Logic

It follows from our description of science that it is inescapably dependent on logic, and this in various senses.

As far as science understood objectively is concerned it is clear that it must be constructed logically. For it is after all constructed systematically, i.e. its propositions stand in logical relations to one another. In its early stages, admittedly, science often amounts to nothing more than a mass of unrelated propositions; this however is regarded by all scientists as unsatisfactory, and the leading motive for research is not only the discovery of new facts but also (and perhaps primarily) the logical ordering of propositions already established. Logic – and furthermore in this case formal logic – therefore forms the indispensable framework for science so understood, which must always presuppose logic.

Logic is similarly a presupposition of science subjectively understood. For this kind of science is first of all systematic knowledge, which consists in the understanding of science in the objective sense. The judgements which constitute this knowledge must therefore be interrelated as much as the propositions of objective science.

If this is so, however, research must also be guided by logic, in two ways: (1) Firstly, of course, the investigator must not only not violate the laws of logic but he must proceed in accordance with these laws. For the acquisition of scientific knowledge is in most cases indirect, that is, inferential. Formal logic is therefore an indispensable presupposition of scientific research. (2) Furthermore research must proceed "methodically": and this means that certain correct methods have to be applied. Such methods are developed in every science according to its particular subject-matter. But all research needs certain general methodical principles, which are applicable to all – or at any rate to many different – sciences. These general methodical principles are discussed in methodology, which, as has been said, forms a part of logic. Hence research, on this account, presupposes logic in the wider sense of the word.

This is not to be taken as meaning that the investigator must learn formal logic or methodology before embarking on his research. On the contrary, we know that in the preliminary stages of a science neither need be known – a natural talent is sufficient. It is also a fact that the principles of logic are first formulated and abstracted from the sciences

when these are fairly advanced. Nevertheless two points remain: (1) *every* science, even when the scientist does not do this deliberately, is constructed according to logical and methodological principles; (2) a careful formulation of these principles is usually necessary in the later phases of the development of a science. "Natural logic" is sufficient for simpler matters; it usually fails when things become more complicated. But it fails regularly and completely when one tries to give an account of the philosophical meaning of what has been achieved: for this an intimate knowledge of formal logic and methodology is absolutely necessary.

Division of the Work

After what has been said one might imagine that general methodology has to do exclusively with the indirect acquisition of knowledge. But this is not the case. Even in the domain of the direct acquisition of knowledge there are certain methods which have now been developed technically and form the subject-matter of general methodology. Among these the *phenomenological* occupies an important place. It is a method of intellectual observation and of the description of what is observed. But it comprises many rules which apply quite generally to all kinds of thinking. It is furthermore one of the most recent methods, one which is not only used today by about a half of contemporary philosophers but which is employed outside philosophy as well in various intellectual disciplines, and seems to be meeting with ever greater recognition. Logic is closely connected with it, in its third part, the philosophy of logic. We shall deal first of all with the phenomenological method.

In recent times three groups of indirect methods have been elaborated. The first has to do with the indirect knowledge which consists in the interpretation of a language. Because of the prime importance of language in many sciences (above all in historical sciences, but also in mathematical ones) the *analysis of language* belongs to the general theory of method. It forms to some extent a counterpart to the phenomenological method: it also is concerned with the analysis of things, but in a completely different, indirect way, by means of a structure of signs.

We shall also be concerned with inference proper. Two kinds of inference will be introduced in this connection: *deductive* and *reductive*. (The meaning of these expressions will be given later).

The work will therefore be divided as follows:

1. The phenomenological method.
2. The analysis of language.
3. The deductive method.
4. The reductive method.

CHAPTER II

THE PHENOMENOLOGICAL METHOD

3. GENERAL REMARKS

Historical Preliminaries

The name "phenomenology" appears to have been used for the first time by Johann Heinrich Lambert in his *Neues Organon* (1764). The word also occurs in Kant (*Metaphysische Anfangsgründe der Naturwissenschaft*, 1786), Hegel (*Phänomenologie des Geistes*, 1807), Renouvier (*Fragments de la philosophie de Sir W. Hamilton*, 1840), Hamilton (*Lectures on Logic*, 1860), Amiel (*Journal intime*, 1869), E. von Hartmann (*Phänomenologie des sittlichen Bewußtseins*, 1879), and in other works. The meaning attached to it has differed very greatly from one writer to another, but none of these early writers used it to denote a precisely circumscribed method of thought.

Edmund Husserl (1859–1938) was the first to use the word "phenomenology" in this sense. His methodological ideas have exerted a decisive influence on European and to some extent also on American philosophy. Between the two World Wars an important school of philosophy gathered around him (Scheler, Ingarden, Farber, Stein, Becker, Fink, Pfänder, Koyré and others). Later on, his method was adopted, with certain modifications, by the existentialist philosophers, and it now constitutes the most important procedure used by this school (Marcel, Heidegger, Sartre, Merleau-Ponty). And since intellectual disciplines in general are being deeply influenced by existentialism in various countries, especially Germany, France and Italy, the phenomenological method has become of great importance for these disciplines also. A few independent thinkers, such as N. Hartmann, also use a kind of phenomenological method. It is therefore no exaggeration to say that at any rate on the European continent the phenomenological method is of decisive significance in philosophy. In North American and English philosophy, on the other hand, it is not much used.