



What is Dialectic?

Karl R. Popper

Mind, New Series, Vol. 49, No. 196. (Oct., 1940), pp. 403-426.

Stable URL:

<http://links.jstor.org/sici?sici=0026-4423%28194010%292%3A49%3A196%3C403%3AWID%3E2.0.CO%3B2-L>

Mind is currently published by Oxford University Press.

Your use of the JSTOR archive indicates your acceptance of JSTOR's Terms and Conditions of Use, available at <http://www.jstor.org/about/terms.html>. JSTOR's Terms and Conditions of Use provides, in part, that unless you have obtained prior permission, you may not download an entire issue of a journal or multiple copies of articles, and you may use content in the JSTOR archive only for your personal, non-commercial use.

Please contact the publisher regarding any further use of this work. Publisher contact information may be obtained at <http://www.jstor.org/journals/oup.html>.

Each copy of any part of a JSTOR transmission must contain the same copyright notice that appears on the screen or printed page of such transmission.

JSTOR is an independent not-for-profit organization dedicated to and preserving a digital archive of scholarly journals. For more information regarding JSTOR, please contact support@jstor.org.

II.—WHAT IS DIALECTIC ?

BY KARL R. POPPER.

There is no theory or opinion, however absurd or incredible, which has not been maintained by some one or other of our philosophers.

—DESCARTES.

I. DIALECTIC EXPLAINED.

THE above motto can be generalised. It is not only valid within the field of philosophy. It appears to be applicable throughout the field of human thought and of human enterprise in general—throughout the whole field of science, technique and policy. And one can say, perhaps, that it would apply, if suitably reformulated, to a still wider field, namely, in considering the forms and appearances of life in general.

For if we want to explain why human thought tends to try out all sorts of conceivable solutions of any problem with which it is faced, then we can refer to a very general sort of regularity. The method by which a solution is approached is usually the same: it is the *method of trial and error*. Fundamentally it is the same method as that applied by living organisms, in the process of adaptation. It is clear that the success of this method depends very largely on the number and variety of the attempted trials: the more we try, the more likely it is that one of our attempts will be successful.

Thus, the method applied in the development of human thought in general, and of philosophy in particular, can well be described as a certain kind of trial and error method. Often, human beings seem inclined to react either in such a way that they emphatically assert some suggested theory and hold to it, trying it out for as long as they can (if it is an error, they may even perish with it), or they emphatically fight against such a theory, once they have discovered its weaknesses. This struggle of ideologies, which is, obviously, explicable in terms of the trial and error method, seems to be a characteristic feature wherever we find anything like a development of human thought. Only where a certain theory or system is dogmatically maintained throughout some longer period does it not occur. We

hardly ever find a continuous development, slow and steady, by continuous degrees of improvement.

If the method of trial and error is developed more and more consciously, then it begins to take on the characteristic features of *scientific method*. This method can briefly be described thus : Faced with a certain problem, the scientist offers tentatively some sort of solution—a theory. But this theory is at first only tentatively accepted by science ; and it is the most characteristic feature of scientific method that scientists will do everything they can in order to criticise and to test the theory in question. Criticising and testing go hand in hand : the theory is criticised from very many different standpoints in order to bring out those points which may be vulnerable. And the testing of the theory proceeds by its vulnerable sides to as severe an examination as possible. This again is the trial and error method. Theories are put forward tentatively and tried out. If the outcome of a test shows that the theory is erroneous, then it is eliminated : the trial and error method is essentially a *method of elimination*. Its success depends mainly on three conditions, namely, that sufficiently many and sufficiently different theories are offered, and that sufficiently severe tests are made. In this way we may secure, if we are lucky, the survival of the fittest theory by a process of elimination.

Assuming this description¹ of the development of human thought in general and of scientific thought in particular to be more or less correct, we are able to understand why such a development can be said to proceed on 'dialectic' lines. Dialectic is a theory which maintains that something—for instance, human thought—develops in a way characterised by the so-called dialectic triad : thesis, anti-thesis, synthesis. First, some idea or theory or movement is given, which may be called "thesis". Such a thesis will often produce opposition, because probably it will be, like most things in this world, of limited value—it will have its weak spots. This opposing idea or movement is called "anti-thesis" because it is directed against the first, the thesis. The struggle between the thesis and the anti-thesis goes on until some solution develops which will, in a certain sense, go beyond both thesis and anti-thesis by recognising the relative value of both, *i.e.*, by trying to preserve the merits and to avoid the limitations of both. This solution, which is the third step, is called "synthesis". Once attained, the synthesis may in turn become the first step of a new dialectic triad, and it will, if the

¹ A more detailed discussion can be found in my book, *Logik der Forschung* (1935).

development does not stop with the particular synthesis reached. Probably the development will not stop, if the synthesis is not entirely satisfactory. For if it is not, it will arouse opposition, and can then be described as a new thesis which has produced a new antithesis: the dialectic triad will proceed at a higher level, and it will reach a third level when a second synthesis is attained.

So much for what is called "dialectic triad". It can hardly be doubted that the dialectic triad describes certain developments fairly well, especially developments of ideas and theories, or of movements which are based on ideas or theories. Such a dialectic development can be *explained* by showing that it proceeds in conformity with the method of trial and error which we have discussed above. But it has to be admitted that it is not exactly the same as the trial and error development. Our description of the trial and error method only speaks about some idea and its criticism, or, using the terminology of dialecticians, about a thesis and its antithesis. But it makes no suggestions about the further development—it does not maintain that a struggle between a thesis and an antithesis will lead to a synthesis. Rather it would tend to suggest that the struggle between an idea and its criticism, or of a thesis and its antithesis will lead to an elimination of the thesis (or, perhaps, of the antithesis) if it is not satisfactory; and to the establishment of another theory only if enough are at hand and are offered for trial.

Thus, the interpretation in terms of the trial and error method may be said to be slightly wider than that in terms of dialectic. It is not confined to a situation where only one thesis is offered to start with, and it can easily be applied to situations where from the very beginning different theses are offered independently of one another, and not only in such a way that the one is opposed by the other. But it has to be admitted that it happens very frequently, perhaps usually, that the development within a certain branch of human activity starts with one single idea only. If so, then the dialectic scheme may often be applicable because this thesis will be open to criticism and thus "produce", as dialecticians usually say, its antithesis.

The dialectician's emphasis on the synthesis involves still another point where dialectic may differ slightly from the trial and error theory. For the trial and error theory as suggested above will be content to say that an unsatisfactory standpoint will be refuted or eliminated. The dialectician insists that there is more to be said than this. He emphasises that although the

theory under consideration may have been refuted, there will be most probably something in it worthy of being preserved, for otherwise it is not very likely that the theory would have been offered and taken seriously. And this valuable feature of the thesis will be made more and more clear by those who defend the thesis against the attacks of their opponents, the adherents of the antithesis. Thus a satisfactory solution of the struggle will be only a synthesis, *i.e.*, a theory in which the best points of both thesis and antithesis are preserved. It must be admitted that such a way of interpreting a certain development is sometimes very satisfactory, and that it is quite a valuable asset within the trial and error view-point.

Let us take the development of physics as an example. We can find very many instances of a theory which after its refutation remains "preserved" in the new theory which replaces it. To put it more precisely: the old formulæ become, from the standpoint of the new ones, approximations, that is, they appear to be very nearly correct, and they can be applied either where we do not demand a very high degree of exactness or, within a certain limited field of application, even as perfectly exact formulæ.

All this can be said in favour of the dialectic viewpoint. But we have to be very careful not to admit too much. We must be very careful, for instance, with a number of metaphors used by dialecticians and, unfortunately, often taken much too seriously. An example is the dialectical saying that the thesis "produces" its antithesis. Actually, it is only our critical attitude which produces the antithesis, and where such an attitude is lacking—which often enough is the case—no antithesis will be produced. Similarly, we have to be careful not to think that a struggle between a thesis and its antithesis will *always* "produce" a synthesis. There are many instances of very futile struggles in the history of human thought, struggles which ended in nothing. And even when a synthesis has been reached, usually it will be a rather crude description of the synthesis to say that it "preserves" the better parts of both, the thesis and the antithesis. Crude, at least, in the sense that such a description may be a possible way of looking at the situation but not an extremely enlightening one, because the synthesis will, in many cases, embody some idea or other which is entirely new and not capable of being reduced, without doing injustice, to foregoing stages of the development. In other words, the synthesis usually will be much more than a construction built merely of material supplied by thesis and antithesis.

Thus, the dialectic interpretation, although not inapplicable, will hardly ever *promote development* by attempting to construct the synthesis out of suggestions which can be gained from the thesis and the antithesis. This is a point which dialecticians are often prepared to stress themselves, but in practice they do not act accordingly, for they always hope that dialectic will enable them to predict the characteristic features of developments to come.

Another point where we have to be very careful is the loose way in which dialecticians speak about contradictions. For there is only one way of criticising a given theory : to show that either it is self-contradictory, or it is contradicted by some other accepted statement, either by other theories or by statements about facts—a case which we usually describe by saying that the theory in question is contradicted by the facts. Thus, any sort of criticism of a theory will *contradict* this theory (and can therefore be called an antithesis). Now, the dialecticians sometimes emphasise that such a contradiction between a thesis and an antithesis is extremely productive, is the very promoter of progress, and that we are therefore quite wrong in assuming, and that logic is quite wrong in teaching, that contradictions are something always to be avoided. They even go so far as to say that a contradiction is something which, quite naturally, occurs everywhere in the world.

I shall discuss this assertion of the dialecticians later more extensively. For the moment, I should like only to emphasise one point : criticism is often productive, and if we want to, we may call certain contradictions “productive”. But they are productive *only because we try to avoid them*, to improve on them, to supersede them. If we did not try to avoid contradictions, then we should have no reason whatsoever to describe the relation between a thesis and its antithesis as something which has to be superseded—which has to be settled by establishing a synthesis. Then we should have no reason whatsoever to say that there is something like a struggle between thesis and antithesis, or like a tension which is a productive force in the development.

The only “force” which promotes the dialectic development is, therefore, *our reluctance* to accept, and to put up with, the contradiction between the thesis and the antithesis. It is not a mysterious force inside these two ideas, not a mysterious tension between them which promotes development—it is purely our decision, our resolution, not to agree to contradictions, which induces us to look out for a new standpoint enabling us to avoid them.

And this resolution is entirely justified. For it can easily be shown that if one were to accept contradictions then one would have to give up any kind of scientific activity: it would mean a complete break-down of science. This can be shown by proving that if two contradictory sentences are admitted, any sentence whatsoever must be admitted.¹ In order to make this point entirely clear I must first prepare the way by expounding two logical rules of deduction, which may demand a little patience of the reader.

All sciences try to promote theories, that is, deductive systems of statements. Such deductive systems consist of certain assumptions and their logical consequences, *i.e.*, statements which are deduced from the assumptions. These deduced statements are often called conclusions. Now the deduction of conclusions proceeds according to certain rules, the so-called rules of deduction. Some of these rules are rather trivial, for instance, the two rules of which I shall make use (*cf.* (1) and (2) below).

In order to explain these two rules, I shall make use of the symbols " p ", " q " and " r ", representing any statements whatsoever. For instance, the symbol " p " may be taken to represent the statement "Socrates is wise". By "not- p ", I symbolise the negation of " p ". Thus, if we choose to substitute for " p " the statement "Socrates is wise", then we have to substitute for "not- p " the statement "Socrates is not wise" or "It is not the case that Socrates is wise".

Furthermore, I shall make use of the symbol "or". In ordinary language, this word is used ambiguously. If I say, "It will rain to-morrow *or* it will not (but not both)," then I am using the word "or" in order to express that the two possibilities are exclusive. But there are other meanings of "or". For instance, if somebody says: "I shall have a sandwich *or* a piece of cake (possibly both)." Here the word "or" is used in a *non-exclusive* sense—it expresses that *at least* one of the two possibilities will come true, possibly both of them. Similarly, in what follows, the symbol "or" shall be used in a strictly non-exclusive sense; this sense can be precisely determined if we agree to use the word "or" in accordance with the following convention:

A compound statement of the form " p or q " (where for the symbol " p " and for the symbol " q " any sentence may be

¹ This fact is not always realised (and shall therefore here be fully dealt with); *cf.* H. Jeffreys, "The Nature of Mathematics" (*Philosophy of Science*, V, 449): "Whether a contradiction entails any proposition is doubtful."

substituted) shall be said to be true if, and only if, at least one of its two constituent sentences, represented by “ p ” and by “ q ” respectively, is true.

Accordingly the statement “ p or q ”, as used here, does not maintain more than that *at least* one of its constituents is true (and possibly both).

Making use of the symbol “or” in this way, it follows at once that from any given single premiss—which may be symbolised by “ p ”—any composite conclusion of the form “ p or q ” can be deduced, where “ p ” symbolises the given premiss and “ q ” any sentence whatsoever. Thus, from the premiss “Socrates is wise” the conclusion “Socrates is wise or Peter is a king” can be deduced, and equally well, “Socrates is wise or Peter is not a king”. This result which may appear rather strange to those who are not used to such an analysis becomes obvious if we remember our convention as to the use of “or”. For, according to this convention, the sentence “Socrates is wise or Peter is a king” must be true if the sentence “Socrates is wise” is true. In other words: whoever admits “ p ”, is bound to admit “ p or q ”, for “ p or q ” must be true if “ p ” is true.

Thus we come to the first rule of deduction of which I must make use, namely,

(1) From any given premiss, symbolised, for instance, by “ p ”, we are entitled to deduce a conclusion of the form “ p or q ” (where “ p ” represents the same sentence as was chosen as the premiss, and where “ q ” represents any sentence whatsoever).

The second rule of deduction of which I have to make use is even more obvious:

(2) From two given premisses of the form:

- (a) “ p or q ”
- (b) “not- p ”

we are entitled to deduce the conclusion “ q ”.

For example: Given the two premisses, “Socrates is wise or Peter is a king (perhaps both) and “Socrates is not wise”, we are entitled to deduce the conclusion “Peter is a king”; in other words, this statement is a logical consequence of the two foregoing ones: Whoever admits the two premisses is bound to admit the conclusion.

That this must be so follows, again, from the meaning we have attached to the symbol “or”. As the second premiss “not- p ” informs us that “ p ” is not true, it follows from the meaning of “or” that, if the premisses are true, “ q ” must be true.

It may be worth noting that this analysis must not be attacked by saying that it misrepresents the real meaning of "or". It is true that this meaning is, by our analysis, over-simplified, that it does not correspond any longer to the ordinary meaning of "or". But all that we are going to base on the above analysis—namely, the proof that the introduction of contradictory sentences must lead to a complete break-down of science—is completely independent of the *ordinary* use of "or". We keep consistently to *our* use of it. And we could easily restate the whole argument without mentioning the word "or" at all, by introducing some artificial symbol like "*i*" or "*V*" instead of it, and our argument would remain valid.

It is a fact that everyone, and dialecticians are no exception, makes (perhaps unconsciously) use of the aforesaid two rules of deduction. But, with the help of these two rules, we can proceed to the proof which I have undertaken to give. For it can easily be shown that these rules permit us to deduce from a pair of contradictory sentences, for instance, from the two sentences, "The sun is shining" and "The sun is not shining", *any sentence whatsoever*.

Let us take these two premisses :

- (a) "The sun is shining"
- (b) "The sun is not shining".

We can deduce with the help of rule (1) from the first of these premisses, the following sentence: "The sun is shining or Cæsar was a traitor". But from this sentence, together with the second premiss (b), we can deduce, following rule (2), that Cæsar was a traitor. And by the same method we can deduce any other sentence. This is extremely important, for if we can deduce any sentence whatsoever, then, clearly, we can always deduce any negation of any sentence whatsoever: It is clear that instead of the sentence "Cæsar was a traitor" we can, if we wish, deduce "Cæsar was not a traitor". In other words, from two contradictory premisses, we can logically deduce anything, and its negation as well. *We therefore convey with such a contradictory theory—nothing*. A theory which involves a contradiction is entirely useless, because it does not convey any sort of information.

From this, we see the real significance of the so-called "law of contradiction". This logical rule, which forbids contradictions, thereby inducing us never to accept any contradiction, secures the possibility of conveying something with the help of a deductive system. Once a contradiction were admitted, all science would collapse.

One sees here the extreme danger of loose and metaphorical ways of expression. The looseness of the dialectician's saying that contradictions are not avoidable and that avoidance is not even desirable because of their fertility, is dangerously misleading. It is misleading because what may be called the fertility of the contradictions is only an outcome of the fact that we don't want to put up with them, an attitude which accords with the law of contradiction. And it is dangerous, because to say that the contradictions need not be avoided, or perhaps even that they cannot be avoided, must lead to the above-mentioned scientific break-down.

This may emphasise that it is a necessity and even a duty for everyone who wants to promote truth and enlightenment, to train himself in the art of expressing things clearly and unambiguously—even if this means giving up certain niceties of metaphor and clever double meanings.

Therefore, one had better avoid certain formulations. For instance, instead of the terminology we have used in speaking of thesis, antithesis and synthesis, dialecticians often describe the dialectic triad by using the term "negation" instead of "antithesis" and "negation of the negation" instead of "synthesis". Such terminology would do no harm if these terms "negation" and "negation of the negation" had not clear and definite logical meanings, different from the dialectic usage. Actually, the misuse of these terms has contributed considerably to the mixing-up of logic and dialectic which so often occurs in the discussions of the dialecticians: frequently they consider dialectic to be a part—the better part—of logic, or something like a reformed, modernised logic. The deeper reasons for such an attitude will be discussed later. At present, I only want to mention that our analysis does not lead us to assume that dialectic has any sort of similarity to logic. For logic can be described—roughly, but well enough for our present purposes—as a theory of deduction. We have no reason to believe that dialectic has anything to do with deduction.

To sum up: What dialectic is—dialectic in the sense in which we can attach a clear meaning to the dialectic triad—can be described in the following manner.

Dialectic, or more precisely, the dialectic triad, maintains that certain developments, or certain historical processes, occur in a certain typical way. It is, therefore, an empirical descriptive theory, comparable, for instance, with a theory which maintains that most living organisms increase their size during some stage of their development, then remain constant, and lastly decrease

until they die ; or with the theory which maintains that opinions are usually held first in a dogmatic attitude, then in a somewhat sceptical attitude, and only afterwards, in a third stage, in a scientific, *i.e.*, critical, attitude. Like such theories, dialectic is not applicable without exceptions—as long as we are careful not to force the dialectic interpretation. Like those theories, dialectic is rather vague. And like those theories, dialectic has nothing particular to do with logic.

The vagueness of dialectic is another of its dangers. It makes it only too easy to force a dialectic interpretation on all sorts of developments and even on quite different things. We find, for instance, a dialectic interpretation which identifies a seed corn with a thesis—the plant which develops from this seed corn with the antithesis—and all the seeds which develop from this plant with the synthesis. That such an application expands the already too vague meaning of the dialectic triad in a way which dangerously increases its vagueness is obvious : it leads to a stage where by describing a development as a dialectic development we do not convey any more than by saying that it is a development in stages—which is not very much. But to interpret the above-mentioned development by saying that germination of the plant is the negation of the seed because the seed ceases to exist when the plant begins to grow, and that the production of a lot of new seeds by the plant is the negation of the negation—a new start on a higher level—is obviously a mere playing with words. (Is this the reason why Engels said of this example that any child can understand it ?)

A theory like logic can be called “fundamental”, thereby indicating that, since it is the theory of all sorts of inferences, it is used all the time by all the sciences. We can say that dialectic in the sense in which we found that we could make a sensible application of it is not a fundamental but merely a descriptive theory. It is therefore about as inappropriate to take dialectic as being part and parcel of logic, or else as being opposed to logic, as it would be to take, say, the theory of evolution. Only the loose, metaphorical and ambiguous way of speaking which we have criticised above could make it appear that dialectic can be *both* a theory describing certain typical developments *and* a fundamental theory such as logic.

From all this it is, I think, clear, that one should be very careful in using the term “dialectic”. It would be best, perhaps, not to use it at all—we can always explain such developments in the clearer terminology of a trial and error development. Exceptions should be made only where no misunderstanding

is possible, and where a certain development really proceeds in a very striking way along the lines of a triad.

II. HEGELIAN DIALECTIC.

So far I have tried to outline the idea of dialectic in a way which, I hope, makes it understandable, and it was my aim not to be unjust regarding its merits. In this outline dialectic is presented as a way of describing developments ; as one way among others, not of fundamental importance, but sometimes quite a suitable one. As opposed to this, dialectic usually has been put forward, especially by Hegel and his school, in an exaggerated and dangerously misleading form.

In order to make Hegel's dialectic understandable it may be useful to refer briefly to a chapter of the history of philosophy—in my opinion not a very pleasant one.

A major issue in the history of modern philosophy is the struggle between the (mainly continental) Cartesianism or *rationalism* on the one side, and the (mainly British) *empiricism* on the other side. Descartes' sentence which I have used as a motto for this paper, is meant by its author, the founder of the rationalistic school, not in the way in which I have made use of it to start with : it is not intended to indicate that the human mind has to try everything in order to arrive at something—*i.e.*, at some useful solution—but rather as a hostile criticism of those who dared to try out all these absurdities. What Descartes had in mind, the main idea behind his sentence, is that the real philosopher should carefully avoid all those absurd and foolish ideas. In order to find truth, he has only to accept the one idea which recommends itself by its reasonableness, which appeals to reason by its lucidity, by its clearness and distinctness, in short, which is self-evident. The Cartesian idea is that we can construct the whole body of science without any reference to experience, just by making use of our reason, for every reasonable proposition (recommending itself by its lucidity) must be a true description of the facts. This, in short, is the theory which the history of philosophy called "rationalism". It can be summed up (using a formulation of a much later, namely the Hegelian, period) in the words : "That which is reasonable must be real !"

As opposed to this theory, empiricism maintains that only experience enables us to decide upon the truth or falsity of a scientific theory. Pure reasoning alone, according to empiricism, can never help us to find the truth ; rather, we have to make use of observations and experiments. It can safely be said that some or other form of empiricism, although perhaps a modest

and modified form, is the only interpretation of scientific method which can be taken seriously in our day. The struggle between the earlier rationalists and empiricists was thoroughly discussed by Kant, who tried to offer some synthesis—a compromise, or rather, a modified form of empiricism. His main interest was to reject pure rationalism. In his *Critique of Pure Reason*, he maintained that the scope of our knowledge is limited to the field of possible experiences and that pure reasoning beyond this field—the attempt to build up a metaphysical system out of pure reason—has no justification whatsoever. This criticism of pure reason was felt as a terrible blow to the hopes of nearly all continental philosophers, and in Germany especially, far from being content with Kant's refutation of metaphysics, philosophers busied themselves with building up new metaphysical systems based on pure speculation, thereby trying to use certain features of Kant's system in order to outdo him. The school thus developed, usually called the school of the German idealists, culminated in Hegel.

There are two points in Hegel's philosophy which we have to discuss—his idealism and his dialectic. In both points Hegel followed Kant, trying to go beyond him. In order to understand Hegel we must therefore outline the roots of his theory in the work of Kant.

Kant started from the fact that science exists. He wanted to *explain* this fact; that is, he wanted to answer the question: "How is science possible?" In other words: How are human minds able to have knowledge of the world? or in short: *How can our mind grasp the world?* (We could call this question the epistemological problem.)

His reasoning was somewhat as follows: The mind can grasp the world or, rather, the world as it appears to us, because this world is not utterly different from our mind—*because it is mind-like*. And it is so, because in the process of obtaining knowledge, of grasping the world, our mind is, so to speak, actively digesting all that material which enters it by our senses. It is forming, moulding this material; it impresses on it its own intrinsic forms—the forms of our thought. What we call "nature"—the world in which we live, the world as it appears to us—is already a world digested, is a world formed by our mind. And being thus assimilated by the mind, it is mind-like.

The answer, "Our mind can grasp the world because the world is mind-like" is a typical *idealistic* argument; for what idealism asserts is just that the world is somewhat of the character of our mind.

I do not intend to argue the pros and cons of this Kantian epistemology and I do not intend to discuss it in detail. But I want to stress that it certainly is not entirely idealistic. It is a mixture, or synthesis, as Kant himself points out, of some sort of realism and some sort of idealism—its realistic element being that the world as it appears to us is some sort of *material* formed by our mind, whilst its idealistic element is, that it is some sort of material *formed by our mind*.

So much for Kant's rather abstract but certainly ingenious epistemology. Before I proceed to Hegel, I must warn those readers (I like them most) who are no philosophers and are used to relying on their common sense, to bear in mind the sentence which I chose as a motto for this paper; for what they will hear now will probably appear to them, in my opinion quite rightly, to be absurd.

As I have said, Hegel in his idealism went beyond Kant. Hegel, too, was concerned with the question: "How can our mind grasp the world?" But his theory—with the other idealists he also answered: "Because the world is mind-like"—was more radical than Kant's. He did not say, like Kant: "Because our mind *forms* the world", he said: "Because our mind *is* the world"; or in another formulation: "Because the reasonable *is* the real—because reality and reason are *identical*."

This is Hegel's so-called "philosophy of identity of reason and reality", or, in short, his "philosophy of identity". It is hardly worth noting that between Kant's: "Because our mind *forms* the world", and Hegel's philosophy of identity: "Because our mind *is* the world" there was, historically, a bridge—namely Fichte's answer: "Because our mind *creates* the world."

Hegel's philosophy of identity "That which is reasonable is real, and that which is real is reasonable; thus, reason and reality are identical" was doubtless an attempt to re-establish rationalism on a new basis. It permitted the philosopher to construct a theory of the world out of pure reasoning and to maintain that this must be a true theory of the real world. Thus it allowed exactly that which Kant had said to be impossible. Hegel, therefore, was bound to refute Kant's arguments against metaphysics. He did this with the help of his dialectic.

To understand his dialectic, we have thus again to go back to Kant. To avoid details, I shall not discuss the triadic construction of Kant's table of categories, although it doubtless inspired Hegel. But I have to refer to Kant's method in rejecting rationalism. I mentioned above that Kant maintained that

the scope of our knowledge is limited to the field of possible experience and that pure reasoning beyond this field is not justified. To show this, he proceeded (in a section of the "Critique" which he headed "Transcendental Dialectic") in the following way. If we try, he showed, to construct a theoretical system out of pure reason, for instance, if we try to argue that the world in which we live is infinite (which obviously goes beyond possible experience), we can do so—but we shall find that we can always argue with the help of analogous arguments in an opposite direction as well. In other words, given such a metaphysical thesis, we always could construct and defend an exactly opposite antithesis; and for any argument which speaks in favour of the thesis, we can easily construct its opposite argument in favour of the antithesis. And both arguments will carry with them a very similar force of conviction—both arguments will appear to be equally, or nearly equally, reasonable. Thus, Kant said, reason is bound to argue against itself and to contradict itself, if used to go beyond possible experience.

If I were allowed to give some sort of modernised reconstruction, or re-interpretation, of Kant, deviating from Kant's own view of what he had done, I should say that Kant showed that the metaphysical principle of reasonableness or self-evidence does not lead unambiguously to one and only one result, to one and only one theory. Rather, it is always possible to argue, with similar apparent reasonableness, in favour of a number of different theories, and even of opposite theories. Thus, if we do not get help from experience, if we cannot make experiments or observations which tell us, at least, to eliminate certain theories—namely those which, although they may seem quite reasonable, are contrary to the observed facts—then we have no hope of ever settling the claims of different competing theories.

But how did Hegel overcome the obstacle of Kant's refutation of rationalism? Very easily: he simply said that contradictions do not matter. They just have to occur in the development of thought and reason. They are only showing the insufficiency of a theory which does not take account of the fact that thought, reason, and with it (according to the philosophy of identity) reality, is not something fixed once and for ever, but that it is developing—that we live in a world of evolution. Kant, so says Hegel, refuted metaphysics, but not rationalism. For what Hegel calls "metaphysics", as opposed to "dialectic", is only such a rationalistic system as does not take account of evolution, motion, development, and thus tries to conceive of reality as something stable, unmoved and free of contradictions. Hegel,

with his philosophy of identity, infers that, as reason develops, the world must develop, and as the development of thought or reason is a dialectic one, the world must also develop in dialectic triads.

Thus we find the following three elements in Hegel's dialectic :

(a) An attempt to supersede Kant's refutation of what Kant called rationalism or metaphysics. This refutation is recognised by Hegel to hold only for systems which are metaphysical in his sense, but not for dialectical rationalism, that is, a kind of rationalism which takes account of the development of reason and is therefore not afraid of contradictions. I wish to remark that in superseding Kant's criticism in this way, Hegel embarks on an extremely dangerous venture which must lead to disaster, for he argues in somewhat the following fashion : " Kant refuted rationalism by saying that it must lead to contradictions with no possibility of avoiding them. I admit that. But it is clear that this argument draws its force from the law of contradiction : it refutes only such systems as want to be free from contradictions. It is not dangerous for a system like mine which is prepared to put up with contradictions—that is, for a dialectic system." It is clear that this argument establishes a dogmatism of an extremely dangerous kind—a dogmatism which has no need to be afraid of any sort of attack. For any attack, any criticism of any theory whatsoever, must be based on the method of pointing out some sort of contradictions, either within the theory itself or between the theory and some facts—as I have already mentioned above. Hegel's method of superseding Kant, therefore, is effective, but unfortunately too effective. It makes his system secure against *any* sort of criticism or attack and thus is dogmatic in a very peculiar sense, so that I should like to call it a " re-inforced dogmatism ". (It may be remarked that we find such re-inforced dogmatism embodied in various dogmatic systems.)

(b) The description of the development of reason in terms of dialectic is an element in Hegel's philosophy which carried with it a considerable amount of plausibility. This becomes clear if we remember that Hegel uses the word " reason " not only in the subjective sense denoting a certain mental capacity, but in the objective sense as well, namely, denoting all sorts of theories, thoughts, ideas and so on. Hegel, who holds that philosophy is the highest expression of reasoning, has in mind mainly the development of philosophical thought when he speaks of the development of reasoning. And indeed there is hardly a field to which the dialectic triad can be more successfully applied than the development of philosophical theories, and it is

therefore not surprising that Hegel's most successful attempt at applying his dialectic method was his *History of Philosophy*.

In order to understand the danger connected with such a success, we have to remember that in Hegel's time—and even much later—*logic* was usually described and defined as the *theory of reasoning* or the theory of thinking, and accordingly the fundamental laws of logic usually were called the “laws of thought”. Therefore, it is not quite incomprehensible that Hegel, believing that dialectic is the true description of our actual procedure when reasoning or thinking, held that he must alter logic so as to make dialectic an important, if not the most important, part of logical theory. This necessitated the discarding of the so-called “law of contradiction” which clearly was a grave obstacle to the embodiment of dialectic. Here we have the origin of the view that dialectic is “fundamental” in the sense that it can compete with logic, that it is an improvement upon logic. We have already criticised such a view of dialectic, and I only want to remark that any sort of logical reasoning, whether before or after Hegel, and whether in science or mathematics or any truly scientific philosophy, is always based on the law of contradiction. Hegel writes (*Logic*, Section 81, (1)) : “It is of the highest importance to ascertain and understand rightly the nature of Dialectic. Wherever there is movement, wherever there is life, wherever anything is carried into effect in the actual world, there Dialectic is at work. It is also the soul of all knowledge which is truly scientific.”

But if by dialectic reasoning Hegel means a reasoning which discards the law of contradiction, then he certainly would not be able to give any instance of such sort of reasoning in science. It is not scientific reasoning itself, not scientific arguing, which is *based* on dialectic, but it is only the *development* of scientific theories which can, with a certain amount of success, be *described* in terms of the dialectic method. As we have seen already, this fact cannot justify the acceptance of dialectic as something fundamental, because it can be comparatively easily explained without leaving the realm of ordinary logic if we remember the working of the trial and error method.

The main danger of such a mix-up of dialectic and logic is, again, that it offers help for arguing dogmatically. For we find only too often that dialecticians, when in logical difficulties, answer their opponents, as a last way out, that their criticism is mistaken, being based on logic of the ordinary type instead of on dialectic ; if they would only use dialectic, then they would see that the contradictions which they found in some arguments

of the dialecticians are quite legitimate—namely from the standpoint of dialectic.

(c) A third element of Hegelian dialectic is based on his philosophy of identity. If reason and reality are identical and reason develops dialectically (as so well exemplified by the development of philosophical thought) then reality must develop dialectically too: the world must be ruled by the laws of dialectical logic. (This standpoint has been called “panlogism”.) Thus, we must find in this world the same contradictions as are permitted by dialectic logic. It is this very fact, namely, that the world is full of contradictions which shows us from another side that the law of contradiction has to be discarded. For this law says that no self-contradictory proposition, or no pair of contradictory propositions, can be *true*, that is, can correspond to the facts. In other words, the law implies that a contradiction can never occur within the facts, that facts can never contradict. But if on the basis of the philosophy of identity of reason and reality, the theory is asserted that facts can be contradictory and can contradict each other, then it is clear that the law of contradiction has to be abandoned.

But apart from what appears to me to be the utter absurdity of the philosophy of identity (about which I shall say a few words later): if we look a little closer into these so-called contradictory facts, then we find that all the various examples proffered by dialecticians just illustrate that the world in which we live shows, sometimes, a certain structure which could perhaps be described with the help of the word “polarity”. An instance of that structure would be the existence of positive and negative electricity. It is only a metaphorical, a very loose, way of speaking, if we, for instance, say that positive and negative electricity are contradictory to each other. An example of a contradiction would be the following two sentences: “This body here was, on the 1st of November, 1938, between 9 and 10 a.m., charged positively,” and an analogous sentence about the same body, saying that it was at the same time not positively charged.

This would be a contradiction between two sentences and the corresponding contradictory fact would be the fact that a body would be at the same time both positively and not positively charged, that is, at the same time attract and not attract certain negatively charged bodies. But we need not say that such contradictory facts do not exist. (A deeper analysis might show that the non-existence of such facts is not a law of the type of the laws of physics, but is based on logic, that is, on the rules governing the use of scientific language.)

These three points, namely, (a) the dialectic opposition against Kant's anti-Rationalism, and consequently, the re-establishment of rationalism supported by a reinforced dogmatism, (b) the incorporation of dialectic into logic, on the ground of the ambiguity of expressions like "reason", "laws of thought", and so on, and (c) the application of dialectic to "the whole world", based on Hegel's panlogism and his philosophy of identity,—these three points seem to me to be the main elements within Hegelian dialectic. Before I proceed to outline dialectic after Hegel, I should like to express my personal opinion about Hegel's philosophy, and especially about his philosophy of identity. I think it represents the worst of all those absurd and incredible philosophic theories to which Descartes refers. It is not only that the philosophy of identity is offered without any sort of serious justification; even the problem to answer which it has been invented—the question "How can our mind grasp the world?"—seems to me not a clearly formulated problem at all. And the idealistic answer, which has been varied by different idealistic philosophers but remains fundamentally the same, namely "Because the world is mind-like", has only the appearance of an answer. But we shall see clearly that it has not the slightest justification, if we only consider some analogous argument, like: "How can this mirror reflect my face?"—"Because it is face-like." Although this sort of arguing is obviously utterly unsound, it has been offered again and again. We find it for instance, in our time, formulated by Jeans¹ in somewhat the following fashion: "How can mathematics grasp the world?"—"Because the world is mathematic-like". He argues, in that way, that reality is of the very nature of mathematics—that the world is a mathematical thought (and therefore ideal). This argument obviously is by no means sounder than the following: "How can language describe the world?"—"Because the World is language-like—it is linguistic," and more particularly: "How can the English language describe the world?"—"Because it is intrinsically British". That this latter argument really is analogous to the one offered by Jeans, is easily seen if we recognise that the mathematical description of the world is just a certain way of describing the world and nothing else, and that mathematics is a means of description—that is: a certain language.

One can show this most easily perhaps with the help of a trivial example. There are primitive languages which do not employ numbers but try to express numerical ideas with the

¹ Other and much more elaborate critical remarks on Jeans' Philosophy can be found in L. S. Stebbing's excellent book, *Philosophy and the Physicist*.

help of expressions for one, two, and many. It is clear that such a language is unable to describe many of those more complicated relationships between certain groups of objects, which can easily be described with the help of the numerical expressions "three", "four", "five", and so on. In other words, mathematical symbols are introduced in a language in order to describe certain more complicated relationships which could not be described otherwise; a language which contains mathematics is, simply, very much richer than a language which has no such symbols. All that we can infer about the nature of the world from the fact that we have to use mathematical language if we want to describe it, is that this world has a certain degree of complexity or that there are certain relationships in this world which cannot be described with too primitive means.

It seems that there is still another point in Jeans' uneasiness regarding the fact that our world happens to suit mathematical formulæ originally invented by pure mathematicians who do not intend at all to apply their formulæ to this world. Jeans was, so it seems at least, originally an inductivist, that is, he thought that theories are obtained from experience by some more or less simple procedure. From such a standpoint it obviously is astonishing to find that a theory which has been formulated by pure mathematicians, in a purely speculative manner, afterwards proves to be applicable to the physical world. But for those who are not inductivists it is not astonishing at all. They know that it happens quite often that a theory put forward originally as a pure speculation, as a mere possibility, later proves to have its empirical applications. They know that often it is this speculative anticipation which prepares the way for the empirical theories. In this way, the so-called problem of induction has a bearing on the problem of idealism with which we are concerned here. But I must leave it with these brief allusions.

III. DIALECTIC AFTER HEGEL.

Hegel's philosophy of identity of reason and reality sometimes is characterised as (absolute) *idealism*, because it states that reality is mind-like or of the character of reason. But it is clear that such a philosophy of identity can easily be converted into some sort of *materialism*. It then could argue that reality is, in fact, of the material or physical character which the ordinary man thinks it to be; and by saying that it is identical with reason, or mind, one would imply that the mind is also a material or physical phenomenon—or, in some less radical form, that if

mind should be somewhat different, then the difference cannot be of great importance.

Such a materialism can be considered to be a renaissance of certain features of Cartesianism, connected with dialectic. But in discarding its original idealistic basis, dialectic loses everything which made it plausible and understandable; we have to remember that the best arguments in favour of dialectic lay in its applicability to the development of thoughts, especially of philosophical thoughts. Now we are faced blankly with the statement that physical reality develops dialectically—an extremely dogmatic assertion with such little scientific backing that materialistic dialecticians are forced to make a very extensive use of the above-described dangerous method of discarding criticism by denouncing it as being non-dialectical. Dialectical materialism thus is in agreement with the points (a) and (b) discussed above, but it alters point (c) considerably, although I think not advantageously for its dialectic features. In expressing this opinion, I want to stress that although I should not describe myself as a materialist, my criticism is not directed against materialism, which I personally should probably prefer to idealism if I were forced to choose (which, fortunately, is not the case). It is only the combination of dialectic and materialism that appears to me to be even worse than dialectic idealism.

These remarks apply particularly to the so-called “Dialectical Materialism” as developed by Marx. The materialistic element in this theory could be comparatively easily reformulated in such a way that no serious objections could be made against it. As far as I can see the main point is this: That there is no reason to assume that, whilst the natural sciences can proceed on the basis of the common man’s realistic outlook, the social sciences need an idealistic background like the one offered by Hegelianism. Such an assumption was often made in Marx’s time, owing to the fact that Hegel with his idealistic theory of the State appeared to influence strongly, and even to further, the social sciences, whilst the futility of his views within the field of the natural sciences was—at least for natural scientists—only too obvious. I think that it is a fair interpretation of the ideas of Marx and Engels, to say that one of their chief interests in emphasising materialism is to dismiss any such theory as, referring to the rational or spiritual nature of man, maintains that sociology has to be based on an idealistic or spiritualistic basis, or on the analysis of reason. As opposed to this they stressed that the material side of human nature—and more particularly the need for food and other material goods—is of basic importance for sociology.

This view, doubtless, was sound ; and I hold Marx's contributions on this point to be of real significance and of lasting influence. Everyone learned from Marx that the development even of ideas cannot be fully understood if the history of ideas is treated purely as such (although such a treatment has its merits) apart from the conditions of their origin and of the situation of their originators, of which conditions the economic aspect is of the highest significance. Nevertheless I personally think that Marx's economism—his emphasis on the economic background as being the ultimate basis of any sort of development—is exaggerated. I think that social experience shows that under certain circumstances the influence of ideas supported by propaganda can outweigh and supersede economic forces. Besides, granted that it is not possible fully to understand mental developments without understanding their economic background : is it possible to understand the economic development without understanding the development, for instance, of scientific, or religious, ideas ?

For our present purpose it is not so important to analyse Marx's materialism and economism, but rather to see what has become of dialectic within his system. Two points seem to me of importance. One is Marx's emphasis on historical method in sociology, a tendency which I may call " historicism ". The other is the anti-dogmatic tendency of Marx's dialectic.

In regard to the first point we have to remember that Hegel was one of the inventors of the historical method—of the school of thinkers who believed that in describing a development historically one has causally explained it. This school believed that one could explain, for instance, certain social institutions by showing how mankind has slowly developed them. Now it is more or less recognised that the historical method has been in general very much over-rated. It is only in the field of the social sciences that historicism still has considerable influence. I have tried to criticise this method elsewhere (in a paper " The Poverty of Historicism " to be published soon). In the present paper I merely want to stress the fact that Marx's sociology adopted from Hegel not only the view that the method of sociology has to be the historical and that sociology has to become a theory of social development, but also the view that this development has to be explained in dialectical terms. To Hegel, history was the history of ideas. Marx dropped idealism but retained Hegel's standpoint that the dynamic forces of historical developments are the dialectical " contradictions ", " negations ", and " negations of negations ". In this respect Marx and Engels followed Hegel very closely indeed, as may be shown by the following quotations. Hegel

(in his *Encyclopædia*, Part, I, ch. vi, § 81) described Dialectic as “the universal and irresistible power before which nothing can stay, however secure and stable it may deem itself.” Similarly, Engels writes (*Anti-Duehring*, Part I, “Dialectics : Negation of the Negation”): “What therefore is the negation of the negation? An extremely general . . . law of development of Nature, history and thought; a law which . . . holds good in the animal and plant kingdoms, in geology, in mathematics, in history, and in philosophy. . . .”

In Marx's view, it is the main task of sociological science to show how these dialectic forces are working in the field of history, and thus to prophesy historical development; or, as he says in the preface to *Capital*: “It is the ultimate aim of this work to lay bare the economic law of motion of modern society.” And this dialectic law of motion, the negation of the negation, furnishes the basis of Marx's prophecy of the impending end of capitalism (*Capital*, I, ch. 24, § 7): “The capitalist mode of production . . . is the first negation. . . . But capitalism begets, with the inexorability of a law of Nature, its own negation. It is the negation of the negation.”

Certainly, prophecy as such need not be unscientific, as predictions of eclipses and other astronomical events show. But Hegelian dialectic, or its materialistic version, cannot be accepted as a sound basis for scientific forecasts. (“But Marx's predictions have all come true”, Marxists usually answer. They have not. To quote one example out of many: In *Capital*, immediately after the last quotation, Marx prophesied that the transition from capitalism to socialism must be, naturally, a process *incomparably less* “protracted, violent, and difficult” than the industrial revolution, and in a footnote he amplified this forecast by referring to the “irresolute and non-resisting bourgeoisie”). Thus, if forecasts based on dialectic are proffered, some will come true and some will not. In the latter case, obviously, a situation will arise which has not been foreseen. But dialectic is vague and elastic enough to interpret and to explain this unforeseen situation just as well as it explained and foretold the other situation which happened not to come true: Any development whatsoever will fit the dialectic scheme; *the dialectician need never be afraid of any refutation by forthcoming experiences*.¹ As mentioned before, it is not only the dialectical approach, but rather it is the very idea of approaching the problems of sociology

¹ In my book, *Logik der Forschung*, I have tried to show that the more a theory conveys, and the greater its scientific content is, the more it risks being refuted by forthcoming experiences; thus *dialectic is unscientific*.

historically, the idea that the large-scale historical forecast is the aim of scientific sociology, which is mistaken. But this does not concern us here.

Apart from the rôle dialectic plays in Marx's historical method, Marx's anti-dogmatic tendencies should be discussed. Marx and Engels strongly emphasised that science should not be interpreted as a body of finally and well-established knowledge, or of "eternal truth", but rather as something developing, progressive. The scientist is not the man who knows a lot but rather the man who is determined not to give up searching for truth. Scientific systems develop; and they develop, according to Marx, dialectically.

There is not very much to say against this point—although personally I think that the dialectical description of scientific development is, unless it is forced, not always applicable and that it is better to describe scientific development in a less ambiguous way, for instance, in terms of the trial and error theory. But I am prepared to admit that this criticism is not of great importance. It is, however, of real moment that Marx's progressive and anti-dogmatic view of science has never been applied by orthodox Marxists within the field of their own activities. Progressive, anti-dogmatic science is critical—criticism is its very life. But criticism of Marxism, of dialectic materialism, has never been tolerated by Marxists.

Hegel thought that while philosophy develops, his own system has to remain the latest and highest stage of this development and cannot be superseded. The Marxists adopted the same attitude towards the Marxian system. Hence, Marx's anti-dogmatic attitude exists only in the theory but not in the practice of orthodox Marxism, and dialectic is used by Marxists, following the example of Engels' *Anti-Duehring*, mainly to defend the Marxist system against criticism, and not to criticise it or to develop it. As a rule, critics are denounced as not understanding dialectic, or as unable to understand proletarian science, or as traitors. Thanks to dialectic the anti-dogmatic tendencies have disappeared, and Marxism has established itself as a dogmatism which is elastic enough, by using its dialectic method, to evade any further attack—in short, as a reinforced dogmatism.

It is clear that nothing can damage scientific development more than dogmatism. There can be no scientific development without free competition of thought—this is the essence of the anti-dogmatic attitude once so strongly supported by Marx and Engels. *And there cannot be free competition of scientific thought without freedom of thought.*

Thus, dialectic has played a very unfortunate rôle not only in the development of philosophy, but also in the development of political theory. A full understanding of this unfortunate rôle will be easier if we try to see how Marx originally came to develop such a theory. We have to consider the whole situation: Marx, a young man who was progressive, evolutionary and even revolutionary in his thought, listening to the lectures of Hegel, then a famous professor in Berlin. Hegel was a representative of Prussian reaction. He used his principle of the identity of reason and reality to support the existing powers—for what exists, is reasonable—and to defend the idea of the absolutistic state (an idea called, to-day, “totalitarianism”). Marx, who admired him, but who was of very different political temperament, was in need of a theory on which to base his political opinions. We can understand that it was, for him, a rather fascinating discovery to find that Hegel’s own dialectical philosophy could easily be *turned against its own master*—that dialectic is in favour of a revolutionary rather than of a conservative and apologetic political theory. Besides this, it fitted excellently his need, not only for a revolutionary, but for an optimistic theory—a theory forecasting progress by emphasising that every new step is a step upwards.

This discovery, although definitely fascinating for a pupil of Hegel and in an era dominated by Hegel, has lost in our day together with Hegelianism any significance, and can hardly be considered from the present viewpoint to be more than a clever joke of a brilliant young student, revealing the weakness of the speculations of his undeservedly famous professor. But it became the theoretical basis of what is called “Scientific Marxism”. And it helped to turn Marxism into a dogmatic system preventing the scientific development of which it might have been capable. Thus, Marxism has remained for decades in its dogmatic attitude, repeating even the same arguments against its opponents which were originally used by its founders. And it is sad but illuminating to see that orthodox Marxism recommends, officially, even to-day, as a basis for the study of scientific methodology, the reading of Hegel’s *Logic*—an entirely obsolete book. It is as if one were to recommend Archimedes’ mechanics as the basis of modern engineering.

The whole development of dialectic should be a warning against speculative philosophy. It should remind us that philosophy must not be made a basis for any sort of scientific system and that philosophers should be much more modest in their claims. For their task, which they can fulfil quite usefully, is the study of the methods of science.