

WHAT IS DIALECTIC ?

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There is nothing so absurd or incredible that it has not been asserted by one philosopher or another.

Descartes

1. DIALECTIC EXPLAINED

THE above motto can be generalized. It applies not only to philosophers and philosophy, but throughout the realm of human thought and enterprise, to science, technology, engineering and politics. Indeed, the tendency to try anything once, suggested by the motto, can be discerned in a still wider realm – in the stupendous variety of forms and appearances which are produced by life on our planet.

Thus if we want to explain why human thought tends to try out every conceivable solution for any problem with which it is faced, then we can appeal to a highly general sort of regularity. The method by which a solution is approached is usually the same; it is the *method of trial and error*. This, fundamentally, is also the method used 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 trials : the more we try, the more likely it is that one of our attempts will be successful.

We may describe the method employed in the development of human thought, and especially of philosophy, as a particular variant of the trial and error method. Men seem inclined to react to a problem either by putting forward some theory and clinging to it as long as they can (if it is erroneous they may even perish with it rather than give it up¹), or by fighting against such a theory, once they have seen its weaknesses. This struggle of ideologies, which is obviously explicable in terms of the method of trial and error, seems to be characteristic of anything that may be called a development in human thought. The cases in which it does not occur are, in the main, those in which a certain theory or system is dogmatically maintained throughout some long period; but there will be few if any examples of a development of thought which is slow, steady, and continuous, and proceeds by successive degrees of improvement rather than by trial and error and the struggle of ideologies.

* from: Karl R. Popper, *Conjectures and Refutations*, Routledge & Kegan Paul, London, 1963, p. 312-335.

A paper read to a philosophy seminar at Canterbury University College, Christchurch, New Zealand, in 1937. First published in: *Mind*, N.S., vol. 49, 1940.

¹ The dogmatic attitude of sticking to a theory as long as possible is of considerable significance. Without it we could never find out what is in a theory—we should give the theory up before we had a real opportunity of finding out its strength; and in consequence no theory would ever be able to play its role of bringing order into the world, of preparing us for future events, of drawing our attention to events we should otherwise never observe.

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'^[2] can briefly be described as follows. Faced with a certain problem, the scientist offers, tentatively, some sort of solution theory. This theory science accepts only provisionally, if at all; and it is most characteristic of the scientific method that scientists will spare no pains to criticize and test the theory in question. Criticizing and testing go hand in hand; the theory is criticized from very many different sides in order to bring out those points which may be vulnerable. And the testing of the theory proceeds by exposing these vulnerable points to as severe an examination as possible. This, of course, is again a variant of the method of trial and error. 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 method of trial and error is essentially a method of elimination. Its success depends mainly on three conditions, namely, that sufficiently numerous (and ingenious) theories should be offered, that the theories offered should be sufficiently varied, and that sufficiently severe tests should be made. In this way we may, if we are lucky, secure the survival of the fittest theory by the elimination of those which are less fit.

If this description^[3] of the development of human thought in general and of scientific thought in particular is accepted as more or less correct, then it may help us to understand what is meant by those who say that the development of thought proceeds on '*dialectic*' lines.

Dialectic (in the modern^[4] sense, i.e. especially in the sense in which Hegel used the term) is a theory which maintains that something – more especially, human thought – develops in a way characterized by what is called the dialectic triad: *thesis*, *antithesis*, and *synthesis*. First there is some idea or theory or movement which may be called a 'thesis'. Such a thesis will often produce opposition, because, like most things in this world, it will probably be of limited value and will have its weak spots. The opposing idea or movement is called the '*antithesis*', because it is directed against the first, the thesis. The struggle between the thesis and the *antithesis* goes on until some solution is reached which, in a certain sense, goes beyond both thesis and antithesis by recognizing their respective values and by trying to preserve the merits and to avoid the limitations of both. This solution, which is the third step, is called the *synthesis*. Once attained, the synthesis in its turn may become the first step of a new dialectic triad, and it will do so if the

² It is not a method in the sense that, if you practice it, you will succeed; or if you don't succeed, you can't have practised it; that is to say, it is not a definite way to results : a method in this sense does not exist.

³ A more detailed discussion can be found in L.Sc.D.

⁴ The Greek expression '*Hē dialektikē (technē)*' may be translated '(the art of) the argumentative usage of language'. This meaning of the term goes back to Plato; but even in Plato it occurs in a variety of different meanings. One at least of its ancient meanings is very close to what I have described above as 'scientific method'. For it is used to describe the method of constructing explanatory theories and of the critical discussion of these theories, which includes the question whether they are able to account for empirical observations, or, using the old terminology, whether they are able to '*save the appearances*'.

particular synthesis reached turns out to be one-sided or otherwise unsatisfactory. For in this case Opposition will be aroused again, which means that the synthesis can then be described as a new thesis which has produced a new antithesis. The dialectic triad will thus proceed on a higher level, and it may reach a third level when a second synthesis has been attained.^[5]

So much for what is called the 'dialectic triad'. It can hardly be doubted that the dialectic triad describes fairly well certain steps in the history of thought, especially certain developments of ideas and theories, and of social movements which are based on ideas or theories. Such a dialectic development may 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 development (described above) of a theory by trial and error. Our earlier description of the trial and error method dealt only with an idea and its criticism, or, using the terminology of dialecticians, with the struggle between a thesis and its antithesis; originally we made no suggestions about a further development, we did not imply that the struggle between a thesis and an antithesis would lead to a synthesis. Rather we suggested that the struggle between an idea and its criticism or between a thesis and its antithesis would lead to the elimination of the thesis (or, perhaps, of the antithesis) if it is not satisfactory; and that the competition of theories would lead to the adoption of new theories only if enough theories 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 so it can easily be applied to situations where from the very beginning a number of different theses are offered, independently of one another, and not only in such a way that the one is opposed to the other. But admittedly it happens very frequently, perhaps usually, that the development of a certain branch of human thought 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 in this way 'produce', as dialecticians usually say, its antithesis.

The dialectician's emphasis involves still another point where dialectic may differ slightly from the general trial and error theory. For the trial and error theory as suggested above will be content to say that an unsatisfactory view will be refuted or eliminated. The dialectician insists that there is more to be said than this. He emphasizes that although the view or theory under consideration may have been refuted, there will most probably be an element in it which is worthy of preservation, for otherwise it is not very likely that it would have been offered at all and taken seriously. This valuable element of the thesis is likely to be brought out more clearly by those who defend the thesis against the attacks of their

⁵ In Hegel's terminology, both the thesis and the antithesis are, by the synthesis, (1) *reduced to components (of the synthesis)* and they are thereby (2) *cancelled (or negated, or annulled, or set aside, or put away)* and, at the same time, (3) *preserved (or stored, or saved, or put away)* and (4) *elevated (or lifted to a higher level)*. The italicized expressions are renderings of the four main meanings of the one German word 'aufgehoben' (literally 'lifted up') of whose ambiguity Hegel makes much use.

opponents, the adherents of the antithesis. Thus the only satisfactory solution of the struggle will be 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 dialectical interpretation of the history of thought may sometimes be quite satisfactory, and that it may add some valuable details to an interpretation in terms of trial and error.

Let us take the development of physics as an example. We can find very many instances which fit the dialectic scheme, such as the corpuscular theory of light which, after first having been replaced by the wave theory, remains 'preserved' in the, new theory which replaces them both. To put it more precisely, the old formulae can usually be described, from the standpoint of the new ones, as approximations; that is to say, they appear to be very nearly correct, so that they can be applied, either if we do not demand a very high degree of exactitude, or even, within certain limited fields of application, as perfectly exact formulae.

All this can be said in favour of the dialectic point of view. But we have to be careful not to admit too much.

We must be careful, for instance, about 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 it is the 'struggle' between a thesis and its antithesis which 'produces' a synthesis. The struggle is one of minds; and these minds must be productive of new ideas: there are many instances of futile struggles in the history of human thought, struggles which ended in nothing. And even when a synthesis has been reached, it will usually be a rather crude description of the synthesis to say that it 'preserves' the better parts of both the thesis and the antithesis. This description will be misleading even where it is true, because in addition to older ideas which it 'preserves', the synthesis will, in every case, embody some new idea which cannot be reduced to earlier stages of the development. In other words, the synthesis will usually be much more than a construction out of material supplied by thesis and antithesis. Considering all this, the dialectic Interpretation, even where it may be applicable, will hardly ever help to develop thought by its suggestion that a synthesis should be constructed out of the ideas contained in a thesis and an antithesis. This is a point which some dialecticians have stressed themselves; nevertheless, they nearly always assume that dialectic can be used as a technique that will help them to promote, or at least to predict, the future development of thought.

But the most important misunderstandings and muddles arise out of the loose way in which dialecticians speak about contradictions.

They observe, correctly, that contradictions are of the greatest importance in the history of thought – precisely as important as is criticism. For criticism invariably consists in pointing out some contradiction; either a contradiction within the theory criticized, or a contradiction between the theory and another theory which we have some reason to accept, or a contradiction between the theory and certain

facts – or more precisely, between the theory and certain statements of fact. Criticism can never do anything except either point out some such contradiction, or, perhaps, simply contradict the theory (i.e. the criticism may be simply the statement of an antithesis). But criticism is, in a very important sense, the main motive force of any intellectual development. Without contradictions, without criticism, there would be no rational motive for changing our theories: there would be no intellectual progress.

Having thus correctly observed that contradictions – especially, of course, the contradiction between a thesis and an antithesis, which 'produces' Progress in the form of a synthesis – are extremely fertile, and indeed the moving forces of any progress of thought, dialecticians conclude – wrongly as we shall see – that there is no need to avoid these fertile contradictions. And they even assert that contradictions cannot be avoided, since they occur everywhere in the world.

Such an assertion amounts to an attack upon the so-called 'law of contradiction' (or, more fully, upon the 'law of the exclusion of contradictions') of traditional logic, a law which asserts that two contradictory statements can never be true together, or that a statement consisting of the conjunction of two contradictory statements must always be rejected as false on purely logical grounds. Appealing to the fruitfulness of contradictions, dialecticians claim that this law of traditional logic must be discarded. They claim that dialectic leads in this way to a new logic – a dialectical logic. Dialectic, which I have so far presented as a merely historical doctrine – a theory of the historical development of thought – would turn out in this way to be a very different doctrine: it would be at the same time a logical theory and (as we shall see) a general theory of the world.

These are tremendous claims, but they are without the slightest foundation. Indeed, they are based on nothing better than a loose and woolly way of speaking.

Dialecticians say that contradictions are fruitful, or fertile, or productive of Progress, and we have admitted that this is, in a sense, true. It is true, however, only so long as we are determined not to put up with contradictions, and to change any theory which involves contradictions; in other words never to accept a contradiction: it is solely due to this determination of ours that criticism, i.e. the pointing out of contradictions, induces us to change our theories, and thereby to progress.

It cannot be emphasized too strongly that if we change this attitude, and decide to put up with contradictions, then contradictions must at once lose any kind of fertility. They would no longer be productive of intellectual progress. For if we were prepared to put up with contradictions, pointing out contradictions in our theories could no longer induce us to change them. In other words, all criticism (which consists in pointing out contradictions) would lose its force. Criticism would be answered by 'And why not?' or perhaps even by an enthusiastic 'There you are!'; that is, by welcoming the contradictions which have been pointed out to us.

But this means that if we are prepared to put up with contradictions, criticism, and with it all intellectual progress, must come to an end.

Thus we must tell the dialectician that he cannot have it both ways. Either he is interested in contradictions because of their fertility: then he must not accept them. Or he is prepared to accept them: then they will be barren, and rational criticism, discussion, and intellectual progress will be impossible.

The only 'force' which propels the dialectic development is, therefore, our determination not to accept, or 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 admit contradictions, which induces us to look out for a new point of view which may enable 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 breakdown of science. This can be shown by proving that *if two contradictory statements are admitted, any statement whatever must be admitted*; for from a couple of contradictory statements any statement whatever can be validly inferred.

This is not always realized,^[6] and will therefore be fully explained here. It is one of the few facts of elementary logic which are not quite trivial, and deserve to be known and understood by every thinking man. It can easily be explained to those readers who do not dislike the use of symbols which look like mathematics; but even those who dislike such symbols should understand the matter easily if they are not too impatient, and prepared to devote a few minutes to this point.

Logical inference proceeds according to certain *rules of inference*. It is valid if the rule of inference to which it appeals is valid; and *a rule of inference is valid if, and only if, it can never lead from true premises to a false conclusion*; or, in other words, if it unfailingly transmits the truth of the premises (provided they are all true) to the conclusion.

We shall need two such rules of inference. In order to explain the first and more difficult one, we introduce the idea of a *compound statement*, that is to say, of a statement such as 'Socrates is wise *and* Peter is a King', or perhaps 'Either Socrates is wise *or* Peter is a King (but not both)' or perhaps 'Socrates is wise *and/or* Peter is a King'. The two statements ('Socrates is wise'; and 'Peter is a king') of which such a compound statement is composed are called component statements.

Now there is one kind of compound statement which interests us here the one which is so constructed that it is true *if and only if at least one of its two components is true*. The ugly expression '*and/or*' has precisely the effect of producing such a compound: the assertion 'Socrates is wise *and/or* Peter is a King'

⁶ See for example H. Jeffreys, 'The Nature of Mathematics', *Philosophy of Science*, **5**, 1938, 449, who writes: 'Whether a contradiction entails any proposition is doubtful.' See also Jeffreys' reply to me in *Mind*, 51, 1942, p. 90, my rejoinder in *Mind*, **52**, 1943, pp. 47 ff., and L.Sc.D., note *2 to section 23. All this was known, in effect, to Duns Scotus (ob. 1308), as has been shown by Jan Lukasiewicz in *Erkenntnis*, **5**, p. 124.

is one which will be true if and only if one or both of its component statements are true; and it will be false if and only if both of its component statements are false.

It is customary in logic to replace the expression 'and/or' by the symbol ' \vee ' (to be pronounced 'vel') and to use such letters as 'p' and 'q' to represent any statement we like. We can then say that a statement of the form ' $p \vee q$ ' will be true if one at least of its two components, p and q, is true.

We are now in a position to formulate our first rule of inference. It may be formulated in this way:

(1) From a premise p (for example, 'Socrates is wise') any conclusion of the form ' $p \vee q$ ' (for example, 'Socrates is wise \vee Peter is a King') may be validly deduced.

That this rule must be valid can be seen at once if we remember the meaning of ' \vee '. This symbol makes a compound which is true whenever at least one of the components is true. Accordingly, if p is true, $p \vee q$ must also be true. Thus our rule can never lead from a true premise to a false conclusion, which means that it is valid.

In spite of its validity, our first rule of inference often strikes those who are not used to such things as strange. And it is indeed a rule which is rarely used in everyday life, since the conclusion contains much less information than the premise. But it is sometimes used, for example, in betting. I may, say, toss a penny twice, betting that heads will turn up at least once. This, obviously, is tantamount to my betting on the truth of the compound statement 'Heads turn up at the first toss \vee heads turn up at the second toss'. The probability of this statement equals 3/4 (according to usual calculations); it is thus different, for example, from the statement 'Heads turn up at the first toss *or* heads turn up at the second toss (but not both)', whose probability is 1/2. Now everybody will say that I have won my bet if heads turned up at the first toss – in other words, that the compound statement on whose truth I was betting must be true if its first component was true; which shows that we argued in accordance with our first rule of inference.

We can also state our first rule in this way

$$\frac{p}{p \vee q}$$

which may be read: 'from the premise p we obtain the conclusion $p \vee q$.'

The second rule of inference which I am going to use is more familiar than the first. If we denote the negation of p by 'non p', then it can be stated in this way

$$\frac{\text{non-p} \\ p \vee q}{q}$$

which may be put in words:

(2) 'From the two premises non p, and $p \vee q$, we obtain the conclusion q.'

The validity of this rule can be established if we consider that non-p is a statement which is true if and only if p is false. Accordingly, if the first premise non-p, is true, then the first component of the second premise is false; thus if both premises are true, the second component of the second premise must be true; that is to say, q must be true whenever the two premises are true.

In reasoning that, if non p is true, p must be false, we have made implicit use, it may be said, of the 'law of contradiction' which asserts that non p and p cannot be true together. Thus if it were my task at this moment to argue in favour of contradiction, we should have to be more cautious. But at this moment, I am only trying to show that using valid *rules of inference*, we can infer from a couple of contradictory premises any conclusion we like.

Using our two rules we can indeed show this. For assume we have the two contradictory premises – say

- (a) The sun is shining now
- (b) The sun is not shining now

From these two premises any statement – for example, 'Caesar was a traitor' can be inferred, as follows.

From the first premise (a) we can infer, in accordance with rule (1), the following conclusion:

- (c) The sun is shining now \vee Caesar was a traitor.

Taking now (b) and (c) as premises, we can ultimately deduce, in accordance with rule (2)

- (d) Caesar was a traitor.

It is clear that by the same method we might have inferred any other Statement we wanted to infer; for example, 'Caesar was not a traitor'. We may thus infer ' $2 + 2 = 5$ ' and ' $2 + 2 \neq 5$ ' – not only every statement we like, but also its negation, which we may not like.

We see from this that if a theory contains a contradiction, then it entails everything, and therefore, indeed, nothing. A theory which adds to every information which it asserts also the negation of this information can give us no information at all. A theory which involves a contradiction is therefore entirely useless *as a theory*.

In view of the importance of the logical situation analysed, I shall now present some other rules of inference which lead to the same result. In contradistinction to rule (1), the rules now to be examined, and to be used, form part of the classical theory of the syllogism, with the exception of the following rule (3) which we shall discuss first.

(3) From any two premises, p and q, we may derive a conclusion which is identical with one of them – say p; or schematically,

$$\frac{p}{\frac{q}{p}}$$

In spite of its unfamiliarity, and of the fact that some philosophers^[7] have not accepted it, this rule is undoubtedly valid; for it must infallibly lead to a true conclusion whenever the premises are true. This is obvious, and indeed trivial; and it is this very triviality which makes the rule, in ordinary discourse, redundant, and therefore unfamiliar. But redundancy does not mean invalidity.

In addition to this rule (3) we shall need another rule which I have called 'the rule of indirect reduction' (because in the classical theory of the syllogism it is implicitly used for the indirect reduction of the 'imperfect' figures to the first or 'perfect' figure).

Assume we have a valid syllogism such as

- (a) All men are mortal
 (b) All Athenians are men
 (c) All Athenians are mortal.

Now the rule of indirect reduction says:

- (4) If $\frac{a}{c}$ is a valid inference, then $\frac{a}{b}$ is a valid inference too.

For example, owing to the validity of the inference of (c) from the premises (a) and (b), we find that

- (a) All men are mortal
 (non-c) Some Athenians are non-mortal
 (non-b) Some Athenians are non-men

must also be valid.

The rule we are going to use as a slight variant of the one just stated; it is this

- (5) If $\frac{a}{c}$ is a valid inference, then $\frac{a}{b}$ is a valid inference too.

Rule (5) may be obtained, for example, from the rule (4) together with the law of double negation which tells us that from non-non-b we may deduce b. Now if rule (5) is valid for any statement a, b, c, which we choose (and only then is it valid) then it must also be valid in case c happens to be identical with a; that is to say, the following must be valid

⁷ Notably G. E. Moore.

that it is not even desirable to avoid them because they are so fertile is dangerously misleading. It is misleading because what may be called the fertility of the contradictions is, as we have seen, merely the result of our decision not 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 breakdown of science, and of criticism, i.e. of rationality. This should emphasize that for anyone who wants to promote truth and enlightenment it is a necessity and even a duty 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 it is better to 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 (of the thesis)' instead of 'antithesis' and 'negation of the negation' instead of 'synthesis'. And they like to use the term 'contradiction' where terms like 'conflict' or perhaps 'opposing tendency' or 'opposing interest', etc., would be less misleading. Their terminology would do no harm if the terms 'negation' and 'negation of the negation' (and similarly, the term 'contradiction') had not clear and fairly definite logical meanings, different from the dialectical usage. In fact the misuse of these terms has contributed considerably to the confusion 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, modernized logic. The deeper reason for such an attitude will be discussed later. At present I shall only say that our analysis does not lead to the conclusion that dialectic has any sort of similarity to logic. For logic can be described – roughly, perhaps, 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 thus. Dialectic, or more precisely, the theory of 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 the theory which maintains that most living organisms increase their size during some stage of their development, then remain constant, and finally decrease until they die; or with the theory which maintains that opinions are held first dogmatically, then sceptically, and only afterwards, in a third stage, in a scientific, i.e. critical, spirit. Like such theories, dialectic is not applicable without exceptions – unless we force the dialectic interpretations – and like such theories, dialectic has no special affinity to 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 of corn with a thesis, the plant which develops from this seed 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 point

where by describing a development as dialectic we convey no more than by saying that it is a development in stages – which is not saying very much. But to interpret this 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?)

The standard examples presented by dialecticians from the field of mathematics are even worse. To quote a famous example used by Engels in the brief form given to it by Hecker,⁹ 'The law of the higher synthesis ... is commonly used in mathematics. The negative (-a) multiplied by itself becomes a^2 , i.e. the negation of the negation has accomplished a new synthesis.' But even assuming a to be a thesis and -a its antithesis or negation, one might expect that the negation of the negation is $-(-a)$, i.e. a, which would not be a 'higher' synthesis, but identical with the original thesis itself. In other words, why should the synthesis be obtained just by multiplying the antithesis with itself? Why not, for example, by adding thesis and antithesis (which would yield 0) ? Or by multiplying thesis and antithesis (which would yield $-a^2$ rather than a^2)? and in what sense is a^2 'higher' than a or -a? (Certainly not in the sense of being numerically greater, since if $a = 1/2$ then $a^2 = 1/4$) The example shows the extreme arbitrariness with which the vague ideas of dialectic are applied.

A theory like logic may be called 'fundamental', thereby indicating that, since it is the theory of all sorts of inferences, it is used all the time by all 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 regard dialectic as part and parcel of logic, or else as opposed to logic, as it would be so to regard, say, the theory of evolution. Only the loose metaphorical and ambiguous way of speaking which we have criticized 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 I think it is 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 use the clearer terminology of the method of trial and error. Exceptions should be made only where no misunderstanding is possible, and where we are faced with a development of theories which does in fact proceed along the lines of a triad.

2. HEGELIAN DIALECTIC

So far I have tried to outline the idea of dialectic in a way which I hope makes it intelligible, and it was my aim not to be unjust about its merits. In this outline dialectic was presented as a way of describing developments; as one way among others, not fundamentally important, but sometimes quite suitable. As opposed to

⁹ Hecker, *Moscow Dialogues*, London, 1936, p. 99. The example is from the *Anti-Dühring*,

this, a theory of dialectic has been put forward, for example by Hegel and his school, which exaggerates its significance, and which is dangerously misleading.

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

A major issue in the history of modern philosophy is the struggle between Cartesian rationalism (mainly continental) on the one hand, and empiricism (mainly British) on the other. The sentence from Descartes which I have used as a motto for this paper was not intended by its author, the founder of the rationalist school, in the way in which I have made use of it. It was not intended as a hint 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 dare to try out such absurdities. What Descartes had in mind, the main idea behind his sentence, is that the real philosopher should carefully avoid absurd and foolish ideas. In order to find truth he has only to accept those rare ideas which appeal to reason by their lucidity, by their clarity and distinctness, which are, in short, 'self-evident'. The Cartesian view is that we can construct the explanatory theories of science without any reference to experience, just by making use of our reason; for every reasonable proposition (i.e. one recommending itself by its lucidity) must be a true description of the facts. This, in brief outline, is the theory which the history of philosophy has called 'rationalism'. (A better name would be 'intellectualism'.) It can be summed up (using a formulation of a much later period, namely that of Hegel) in the words: 'That which is reasonable must be real.'

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 establish factual truth; we have to make use of observation and experiment. It can safely be said that empiricism, in some form or other, although perhaps in 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 what a dialectician (but not Kant) might describe as a synthesis of the two opposing views, but what was, more precisely, a modified form of empiricism. His main interest was to reject pure rationalism. In his Critique of Pure Reason he asserted that the scope of our knowledge is limited to the field of possible experience, and that speculative reasoning beyond this field – the attempt to build up a metaphysical system out of pure reason – has no justification whatever. This criticism of pure reason was felt as a terrible blow to the hopes of nearly all continental philosophers; yet German philosophers recovered and, far from being convinced by Kant's rejection of metaphysics, hastened to build up new metaphysical systems based on 'intellectual intuition'. They tried to use certain features of Kant's system, hoping thereby to evade the main force of his criticism. The school which developed, usually called the school of the German idealists, culminated in Hegel.

There are two aspects of Hegel's philosophy which we have to discuss his idealism and his dialectic. In both cases Hegel was influenced by some of Kant's ideas, but tried to go further. In order to understand Hegel we must therefore show how his theory made use of Kant's.

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?' or, 'How are human minds able to gain knowledge of the world', or, 'How can our minds grasp the world?' (We might 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 the mind – because it is mind-like. And it is so, because in the process of obtaining knowledge, of grasping the world, the mind is, so to speak, actively digesting all that material which enters it by the senses. It is forming, moulding this material; it impresses on it its own intrinsic forms or laws – the forms or laws 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, a world formed, by our minds. And being thus assimilated by the mind, it is mind-like.

The answer, 'The mind can grasp the world because the world as it appears to us is mind-like' is an idealistic argument; for what idealism asserts is just that the world has something of the character of mind.

I do not intend to argue here for or against this Kantian epistemology and I do not intend to discuss it in detail. But I want to point out that it certainly is not entirely idealistic. It is, as Kant himself points out, a mixture or a synthesis, of some sort of realism and some sort of idealism – its realist element being the assertion that the world, as it appears to us, is some sort of material formed by our mind, whilst its idealist element is the assertion 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 beg those readers (I like them best) who are not philosophers and who 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 – absurd.

As I have said, Hegel in his idealism went further than Kant. Hegel, too, was concerned with the epistemological question, 'How can our minds grasp the world?' With the other idealists, he answered: 'Because the world is mind-like.' But his theory was more radical than Kant's. He did not say, like Kant, 'Because the mind *digests* or *forms* the world'. He said, 'Because the 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 the identity of reason and reality', or, for short, his 'philosophy of identity'. It may be noted in passing that between Kant's epistemological answers, 'Because the mind forms the world', and Hegel's philosophy of identity, 'Because the mind is the world', there was, historically, a bridge – namely Fichte's answer, 'Because the mind creates the world'.^[10]

¹⁰ This answer was not even original, because Kant had considered it previously; but he of course rejected it.

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 undoubtedly 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 what Kant had said to be impossible. Hegel, therefore, was bound to try to refute Kant's arguments against metaphysics. He did this with the help of his dialectic.

To understand his dialectic, we have to go back to Kant again. To avoid too much detail, I shall not discuss the triadic construction of Kant's table of categories, although no doubt it inspired Hegel.^[11] But I have to refer to Kant's method of 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. In a section of the Critique which he headed 'Transcendental Dialectic' he showed this as follows. If we try 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 (an idea which obviously goes beyond possible experience) – then we can do so; but we shall find to our dismay that we can always argue, with the help of analogous arguments, to the opposite effect as well. In other words, given such a metaphysical thesis, we could always construct and defend an exact antithesis; and for any argument which supports the thesis, we can easily construct its opposite argument in favour of the antithesis. And both arguments will carry with them a similar force and conviction – both arguments will appear to be equally, or almost 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 to give some sort of modernized reconstruction, or reinterpretation, 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 or theory. 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 get no help from experience, if we cannot make experiments or observations which at least tell us 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 competing theories.

How did Hegel overcome Kant's refutation of rationalism? Very easily, by holding that contradictions do not matter. They just have to occur in the development of thought and reason. They only show the insufficiency of a theory which does not take account of the fact that thought, that is reason, and with it (according to the philosophy of identity) reality, is not something fixed once and for all, but 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

¹¹ MacTaggart has made this point the centre of his interesting *Studies in Hegelian Dialectic*.

stable, unmoved and free of contradictions. Hegel, with his philosophy of identity, infers that since reason develops, the world must develop, and since 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 evade Kant's refutation of what Kant called 'dogmatism' in metaphysics. This refutation is considered by Hegel to hold only for systems which are metaphysical in his more narrow sense, but not for dialectical rationalism, which takes account of the development of reason and is therefore not afraid of contradictions. In evading Kant's criticism in this way, Hegel embarks on an extremely dangerous venture which must lead to disaster, for he argues something like this: 'Kant refuted rationalism by saying that it must lead to contradictions. I admit that. But it is clear that this argument draws its force from the law of contradiction: it refutes only such systems as accept this law, i.e. such as try 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 need no longer 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 contradiction, either within the theory itself or between the theory and some facts, as I said 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 it is dogmatic in a very peculiar sense, so that I should like to call it a 'reinforced dogmatism'. (It may be remarked that similar reinforced dogmatisms help to support the structures of other dogmatic systems as well.)

(b) The description of the development of reason in terms of dialectic is an element in Hegel's philosophy which, had a good deal of plausibility. This becomes clear if we remember that Hegel uses the word 'reason' not only in the subjective sense, to denote a certain mental capacity, but also in the objective sense, to denote 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 hardly anywhere can the dialectic triad be more successfully applied than in the study of 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 were usually called the 'laws of thought'. It is therefore quite understandable that Hegel, believing that dialectic is the true description of our actual procedure when reasoning and thinking, held that he must alter logic so as to make dialectic an important, if not the most important, part of logical theory. This made it necessary to discard the 'law of contradiction', which clearly was a grave obstacle to the acceptance 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. I have already criticized this view of dialectic, and I only want to repeat that any sort of logical reasoning, whether before or after Hegel, and whether in science or in mathematics or in any truly rational philosophy, is always based on the law of contradiction. But 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 reasoning in science. (The many instances quoted by dialecticians are without exception on the level of Engel's examples referred to above – the grain and $(-a)^2 = a^2$ – or even worse.) It is not scientific reasoning itself which is based on dialectic; it is only the history and development of scientific theories which can with some success be described in terms of the dialectic method. As we have seen, this fact cannot justify the acceptance of dialectic as something fundamental, because it can be 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 confusion of dialectic and logic is, as I said, that it helps people to argue dogmatically. For we find only too often that dialecticians, when in logical difficulties, as a last resort tell their opponents that their criticism is mistaken because it is based on logic of the ordinary type instead of on dialectic; if they would only use dialectic, they would see that the contradictions which they have found in some arguments of the dialecticians are quite legitimate (namely from the dialectic point of view).

(c) A third element in Hegelian dialectic is based on his philosophy of identity. If reason and reality are identical and reason develops dialectically (as is 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 'pentagram'.) Thus, we must find in the world the same contradictions as are permitted by dialectic logic. It is this very fact that the world is full of contradictions which shows us from another angle 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 in nature, i.e. in the world of facts, and that facts can never contradict each other. But on the basis of the philosophy of the identity of reason and reality, it is asserted that facts can contradict each other since ideas can contradict each other and that facts develop through contradictions, just as ideas do; so 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 something later), if we look a little closer into these so-called contradictory facts, then we find that all the examples proffered by dialecticians just state 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 and loose way of speaking to say, for instance, that positive and negative electricity are contradictory to each other. An example of a true contradiction would be two sentences: 'This body here was, on the 1st of November, 1938, between 9 and 10 a.m., positively charged', 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 is, as a whole, at the same time both positively and not positively charged, and thus at the same time both attracts and does 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 which is akin to laws of physics, but is based on logic, that is, on the rules governing the use of scientific language.)

So there are three points: (a) the dialectic opposition to Kant's anti-rationalism, and consequently the re-establishment of rationalism supported by a reinforced dogmatism; (b) the incorporation of dialectic in logic, grounded on the ambiguity of expressions like 'reason', 'laws of thought', and so on; (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 the fate of 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 in the sentence which I have chosen as the motto for this paper. It is not only that philosophy of identity is offered without any sort of serious argument; even the problem which it has been invented to answer – the question, 'How can our minds grasp the world?' – seems to me not to be at all clearly formulated. And the idealist answer, which has been varied by different idealist philosophers but remains fundamentally the same, namely, 'Because the world is mind-like', has only the appearance of an answer. We shall see clearly that it is not a real answer if we only consider some analogous argument, like: 'How can this mirror reflect my face?' 'Because it is face-like.' Although this sort of argument is obviously utterly unsound, it has been formulated again and again. We find it formulated by Jeans, for instance, in our own time, along lines like these: 'How can mathematics grasp the world?' – 'Because the world is mathematics-like.' He argues thus that reality is of the very nature of mathematics – that the world is a mathematical thought (and therefore ideal). This argument is obviously no sounder than the following: 'How can language describe the world?' – 'Because the world is language-like – it is linguistic', and no sounder than: 'How can the English language describe the world?' – 'Because the world is intrinsically British.' That this latter argument really is analogous to the one advanced by Jeans is easily seen if we recognize that the mathematical description of the world is just a certain way of describing the world and nothing else, and that mathematics supplies us with the means of description – with a particularly rich language.

Perhaps one can show this most easily with the help of a trivial example. There are primitive languages which do not employ numbers but try to express numerical ideas with the help of expressions for one, two, and many. It is clear that such a language is unable to describe some of the 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. It can say that A has many sheep, and more than B, but it cannot say that A has 9 sheep and 5 more than B. In other words, mathematical symbols are introduced into a language in order to describe certain more complicated relationships which could not be described otherwise; a language which contains the arithmetic of natural numbers is simply richer than a language which lacks the appropriate 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 the world has a certain degree of complexity, so that there are certain relationships in it which cannot be described with the help of too primitive instruments of description.

Jeans was uneasy about the fact that our world happens to suit mathematical formulae originally invented by pure mathematicians who did not intend at all to apply their formulae to the world. Apparently he originally started off as what I should call an 'inductivist'; that is, he thought that theories are obtained from experience by some more or less simple procedure of inference. If one starts from such a position 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, this 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 problem of induction, as it is called, has a bearing on the problem of idealism with which we are concerned here.)

3. DIALECTIC AFTER HEGEL

The thought that facts or events might mutually contradict each other appears to me as the very paradigm of thoughtlessness.

David Hilbert

Hegel's philosophy of the identity of reason and reality is sometimes characterized as (absolute) idealism, because it states that reality is mind-like or of the character of reason. But clearly such a dialectical philosophy of identity can easily be turned round so as to become a kind of materialism. Its adherents would then argue that reality is in fact of material or physical character, as the ordinary man thinks it is; 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 if not, that the difference between the mental and the physical cannot be of great importance.

This materialism can be regarded as a revival of certain aspects of Cartesianism, modified by links 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 thought, especially of philosophical thought. Now we are faced blankly with the statement that physical reality develops dialectically – an extremely dogmatic assertion with so little scientific support that materialistic dialecticians are forced to make a very extensive use of the dangerous method we have already described whereby criticism is rejected as non-dialectical. Dialectical materialism is thus in agreement which points (a) and (b) discussed above, but it alters point (c) considerably, although I think with no advantage to its dialectic features. In expressing this opinion, I want to stress the point 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 happily I am not). 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 'Dialectical Materialism' developed by Marx. The materialistic element in this theory could be comparatively easily reformulated in such a way that no serious objections to it could be made. As far as I can see the main point is this: 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 idealist 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 idealist theory of the State appeared strongly to influence, and even to further, the social sciences, while the futility of views which he held within the field of the natural sciences was – at least for natural scientists – only too obvious.^[12] I think it is a fair Interpretation of the ideas of Marx and Engels to say that one of their chief interests in emphasizing materialism was to dismiss any theory which, referring to the rational or spiritual nature of man, maintains that sociology has to be based on an idealist or spiritualist basis, or on the analysis of reason. In opposition they stressed the material side of human nature – such as our need for food and other material goods – and its importance for sociology.

This view was undoubtedly sound; and I hold Marx's contributions on this point to be of real significance and lasting influence. Everyone learned from Marx that the development even of ideas cannot be fully understood if the history of ideas is treated (although such a treatment may often have its great merits) without mentioning the conditions of their origin and the situation of their originators,

¹² At least it should be obvious to everybody who considers, as an instance, the following surprising analysis of the essence of *electricity* which I have translated as well as I could, even to the extent of trying to render it more understandable than Hegel's original:

'Electricity ... is the purpose of the form from which it emancipates itself, it is the form that is just about to overcome its own indifference; for, electricity is the immediate emergence, or the actuality just emerging, from the proximity of the form, and still determined by it-not yet the dissolution, however, of the form itself, but rather the more superficial process by which the differences desert the form which, however, they still retain, as their condition, having not yet grown into independence of and through them.' (No doubt it ought to have been 'of and through *it*'; but I do not wish to suggest that this would have made much difference to the differences.) The passage is from Hegel's *Philosophy of Nature*. See also the passages on Sound and on Heat, quoted in my *Open Society*, note 4 to ch. 12.

among which conditions the economic aspect is highly significant. Nevertheless I personally think that Marx's economism – his emphasis on the economic background as the ultimate basis of any sort of development – is mistaken and in fact untenable. I think that social experience clearly shows that under certain circumstances the influence of ideas (perhaps supported by propaganda) can outweigh and supersede economic forces. Besides, granted that it is impossible fully to understand mental developments without understanding their economic background, it is at least as impossible to understand economic developments without understanding the development of, for instance, scientific or religious ideas.

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

As for the first point, we have to remember that Hegel was one of the inventors of the historical method, a founder of the school of thinkers who believed that in describing a development historically one has causally explained it. This school believed that one could, for example, explain certain social institutions by showing how mankind has slowly developed them. Nowadays it is often recognized that the significance of the historical method for social theory has been much over-rated; but the belief in this method has by no means disappeared. I have tried to criticize this method elsewhere (especially in my book *The Poverty of Historicism*). Here I merely want to stress that Marx's sociology adopted from Hegel not only the view that its method has to be historical, and that sociology as well as history have to become theories 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 doctrine that the dynamic forces of historical development 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 *Encyclopaedia* (Part I ch. VI p. 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-Dühring*, 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 kingdom, 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 history, and thus to prophesy the course of history; 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*, 1, ch. XXIV, p. 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.'

Prophecy certainly 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 all Marx's predictions have come true,' Marxists usually answer. They have not. To quote one example out of many: In *Capital*, immediately after the last passage quoted, Marx said that the transition from capitalism to socialism would naturally be 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'. Few Marxists will say nowadays that these predictions were successful.) Thus if forecasts based on dialectic are made, 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 interpreted and explained the situation which it predicted and which happened not to come true. Any development whatever will fit the dialectic scheme; the dialectician need never be afraid of any refutation by future experience.^[13] As mentioned before, it is not just the dialectical approach, it is, rather, the idea of a theory of historical development – the idea that scientific sociology aims at large-scale historical forecasts – which is mistaken. But this does not concern us here.

Apart from the role dialectic plays in Marx's historical method, Marx's anti-dogmatic attitude should be discussed. Marx and Engels strongly insisted that science should not be interpreted as a body of final 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 the search for truth. Scientific systems develop; and they develop, according to Marx, dialectically.

There is not very much to be said against this point – although personally I think that the dialectical description of scientific development is not always applicable unless it is forced, and that it is better to describe scientific development in a less ambitious and ambiguous way, as for example, 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 dialectical materialism, has never been tolerated by Marxists.

Hegel thought that philosophy develops; yet his own system was to remain the last and highest stage of this development and could not be superseded. The Marxists adopted the same attitude towards the Marxism system. Hence, Marx's anti-dogmatic attitude exists only in the theory and not in the practice of orthodox Marxism, and dialectic is used by Marxists, following the example of Engels'

¹³ In *L.Sc.D.* I have tried to show that the scientific content of a theory is the greater the more the theory conveys, the more it risks, the more it is exposed to refutation by future experience. If it takes no such risks, its scientific content is zero—it has no scientific content, it is metaphysical. By this standard we can say that dialectic is unscientific: it is metaphysical.

Anti-Dühring, mainly for the purposes of apologetics-to defend the Marxist system against criticism. As a rule critics are denounced for their failure to understand the dialectic, or proletarian science, or for being traitors. Thanks to dialectic the anti-dogmatic attitude has disappeared, and Marxism has established itself as a dogmatism which is elastic enough, by using its dialectic method, to evade any further attack. It has thus become what I have called a reinforced dogmatism.

Yet there can be no worse obstacle to the growth of science than a reinforced dogmatism. There can be no scientific development without the free competition of thought – this is the essence of the anti-dogmatic attitude once so strongly supported by Marx and Engels; and in general there cannot be free competition in scientific thought without freedom for all thought.

Thus dialectic has played a very unfortunate role not only in the development of philosophy, but also in the development of political theory. A full understanding of this unfortunate role 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, came under the influence of Hegel, the most famous German philosopher. Hegel had been a representative of Prussian reaction. He had 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 Absolute State (an idea nowadays called 'Totalitarianism'). Marx, who admired him, but who was of a very different political temperament, needed a philosophy on which to base his own political opinions. We can understand his elation at discovering that Hegel's dialectical philosophy could easily be turned against its own master – that dialectic was in favour of a revolutionary political theory, rather than of a conservative and apologetic one. Besides this, it was excellently adapted to his need for a theory which should be not only revolutionary, but also optimistic – a theory forecasting progress by emphasizing that every new step is a step upwards.

This discovery, although undeniably fascinating for a disciple of Hegel and in an era dominated by Hegel, has now, together with Hegelianism, lost all significance, and can hardly be considered to be more than the clever *tour de force* of a brilliant young student revealing a weakness in the speculations of his undeservedly famous master. But it became the theoretical basis of what is called 'Scientific Marxism'. And it helped to turn Marxism into a dogmatic system by preventing the scientific development of which it might have been capable. So Marxism has for decades kept its dogmatic attitude, repeating against its opponents just the same arguments as were originally used by its founders. It is sad but illuminating to see how orthodox Marxism today officially recommends, as a basis for the study of scientific methodology, the reading of Hegel's *Logic* – which is not merely obsolete but typical of prescientific and even pre-logical ways of thinking. It is worse than recommending Archimedes' mechanics as a basis for modern engineering.

The whole development of dialectic should be a warning against the dangers inherent in philosophical system-building. 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. One task which they can fulfil quite usefully is the study of the critical methods of science.

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