3: Kant – Logic and Dialectics

The most direct path to the creation of dialectical logic, as we have already said, is 'repetition of the past', made wise by experience, repetition of the work of Marx, Engels, and Lenin, or critical, materialist rethinking of the achievements that humanity owes in the realm of the Higher Logic to classical German philosophy of the end of the eighteenth and beginning of the nineteenth centuries, to the process of spiritual maturing, striking in its rapidity, associated with the names of Kant, Fichte, Schelling, and Hegel.

The 'matter of logic' then underwent, in a very short historical period, the most prodigious 'flight of imagination' since antiquity, marked in itself by an inner dialectic so tense that even simple acquaintance with it still cultivates dialectical thinking.

First of all we must note that it was German classical philosophy that clearly recognised and sharply expressed the fact that all problems of philosophy as a special science somehow or other turned on the question of ***what thought was and what were its interrelations with the external world***. Understanding of this fact, already matured earlier in the systems of Descartes and Locke, Spinoza and Leibniz, was now transformed into the consciously established jumping-off point of all investigations, into the basic principle of a critical rethinking of the results of the preceding

development. Philosophy, completing in Kant a more than two-century cycle of investigation, entered on a fundamentally new stage of understanding and resolving of its special problems.

The need to examine and analyse the path critically was not of course dictated only by the inner needs of philosophy itself, by the striving to completeness and orderliness (although the philosophers themselves so expressed it), but mainly by the powerful pressure of outside circumstances, the crisis-ridden, prerevolutionary state of all intellectual culture. The intense conflict of ideas in all spheres of intellectual life, from politics to natural science, willy-nilly involved in ideological struggle, more and more insistently impelled philosophy to dig down ultimately to the very roots and sources of what was happening, to understand where the general cause of the mutual hostility between people and ideas was hidden, to find and point out to people the rational way out of the situation that had arisen.

Kant was the first to attempt to embrace within the framework of a single conception all the main opposing principles of the thought of the time which was approaching a catastrophic collision. In trying to unite and reconcile those principles within one system he only, against his will, exposed more clearly the essence of the problems which were unresolvable by the tried and known methods of philosophy.

The actual state of affairs in science presented itself to Kant as a war of all against all; in the image of that ‘natural’ state which, following Hobbes, he characterised (as applied to science) as ‘a state of injustice and violence’. In this state scientific thought (‘reason’) ‘can establish and secure its assertions only through ***war***...’. In that case ‘the disputes are ended by a victory to which both sides lay claim, and which is generally followed by a merely temporary armistice, arranged by some mediating authority....’ [*Critique of Pure Reason*]

Putting it another way, it was the tension of the struggle between opposing principles, each of which had been developed into a system claiming universal significance and recognition, that constituted the ‘natural’ state of human thought for Kant. The ‘natural’, actual, and obvious state of thought, consequently, was just dialectics. Kant was not at all concerned to extirpate it once and for all from the life of reason, i.e. from science understood as a certain developing whole, but only ultimately to find a corresponding ‘rational’ means of resolving the contradictions, discussions, disputes, conflicts, and antagonisms arising in science. Could reason itself, without the aid of ‘authority’, overcome the anguish of dissension?

‘The endless disputes of a merely dogmatic reason,’ as he put it, ‘thus finally constrain us to seek relief in some critique of reason itself, and in a legislation based upon such criticism.’

The state of endless disputes, and hostility between theoreticians, seemed to Kant to be a consequence of the fact that the ‘republic of scholars’ did not as yet have a single, systematically developed ‘legislation’ recognised by all, or ‘constitution of reason’, which would enable it to seek solution of the conflicts not in war ‘to the death’ but in the sphere of polite, academic discussion, in the form of a ‘legal process’ or ‘action’ in which each party would hold to one and the same ‘code’ of logical substantiation and, recognising the opponent as an equally competent and equally responsible party as himself, would remain not only critical but also self-critical, always ready to recognise his mistakes and transgressions against the logical rules. This ideal of the inter-relations of theoreticians – and it is difficult to raise any objection against it even now – loomed before Kant as the goal of all his investigations.

But thereby, at the centre of his attention, there was above all that field which tradition assigned to the competence of logic. It was quite obvious

to Kant, on the other hand, that logic in the form in which it existed could not in any way satisfy the pressing needs of the situation created, or serve as a tool to analyse it. The very term ‘logic’ was so discredited by then that Hegel was fully justified in speaking of the universal and complete scorn for this science that for ‘hundreds and thousands of years . . . was just as much honoured as it is despised now’. [*Lectures on the History of Philosophy*] And only the profound reform that it underwent in the work of the classical German philosophers restored respect and dignity to the very name of the science of thought. Kant was the very first to try to pose and resolve the problem of logic specifically by way of a critical analysis of its content and historical fate. For the first time he compared its traditional baggage with the real processes of thinking in natural science and in the sphere of social problems.

Kant above all set himself the goal of bringing out and summing up the undisputed truths which had been formulated within the framework of traditional logic, though also scorned for their banality. In other words he tried to bring out those ‘invariants’ that had remained unaffected during all the discussions on the nature of thinking stretching over centuries and millennia, the propositions that no one had called in question, neither Descartes nor Berkeley, neither Spinoza nor Leibniz, neither Newton nor Huygens, not one theoretically thinking individual. Having singled this ‘residue’ out from logic, Kant was satisfied that what remained was not very much, a few quite general propositions formulated in fact by Aristotle and his commentators.

From the angle from which Kant surveyed the history of logic it was impossible to draw any other conclusion; for it went without saying that if one sought only those propositions in logic with which everyone equally agreed, both Spinoza and Berkeley, both the rationalist-naturalist and the theologian, and all their disagreements were taken out of the brackets, then nothing else would remain within the brackets, nothing except those

completely general ***ideas*** (notions) about thought that seemed indisputable to all people thinking in the defined tradition. There thus existed a ***purely empirical*** generalisation, really stating only that not a single one of the theoreticians so far occupying themselves with thought had actually disputed a certain totality of judgments. But you could not tell from these judgments whether they were true in themselves, or were really only common and generally accepted illusions.

For all theoreticians had hitherto thought (or had only tried to think) in accordance with a number of rules. Kant, however, transformed the purely empirical generalisation into a theoretical judgment (i.e. into a universal and necessary one) about the subject matter of logic in general, about the legitimate limits of its subject matter: 'The sphere of logic is quite precisely delimited; its sole concern is to give an exhaustive exposition and a strict proof of the formal rules of all thought....'. Here 'formal' means quite independent of how thought precisely is understood, and of its origins and objects or goals, its relations to man's other capacities and to the external world, and so on and so forth, i.e. independent of how the problem of the 'external' conditions within which thinking is performed according to the rules is resolved, and of metaphysical, psychological, anthropological, and other considerations. Kant declared these rules to be absolutely true and universally obligatory for thought in general, 'whether it be *a priori* or empirical, whatever be its origin or object, and whatever hindrances, accidental or natural, it may encounter in our minds'.

Having thus drawn the boundaries of logic ('that logic should have been thus successful is an advantage which it owes entirely to its limitations, whereby it is justified in abstracting indeed, it is under obligation to do so from all objects of knowledge and their differences....'), Kant painstakingly investigated its fundamental possibilities. Its competence proved to be very narrow. By virtue of the formality mentioned, it of necessity left out of account the differences in

the views that clashed in discussion, and remained absolutely neutral not only in, say, the dispute between Leibniz and Hume but also in a dispute between a wise man and a fool, so long as the fool 'correctly' set out whatever ideas came into his head from God knew where, and however absurd and foolish they were. Its rules were such that it must logically justify any absurdity so long as the latter was not self-contradictory. A self-consistent stupidity must pass freely through the filter of general logic.

Kant especially stresses that 'general logic contains, and can contain, no rules for judgment', that is 'the faculty of ***subsuming*** under the rules; that is, of distinguishing whether something does or does not stand under a given rule (*casus datae legis*)'. The firmest knowledge of the rules in general (including the rules of general logic) is therefore no guarantee of their faultless application. Since 'deficiency in judgment is just what is ordinarily called stupidity', and since 'for such a failing there is no remedy', general logic cannot serve either as an 'organon' (tool, instrument) of real knowledge or even as a 'canon' of it, i.e. as a criterion for testing ready-made knowledge.

For what then, in that case, is it in general needed? Exclusively for checking the correctness of so-called analytical judgments, i.e. ultimately, acts of verbal exposition of ready-made ideas already present in the head, however unsound these ideas are in themselves, Kant stated in full agreement with Berkeley, Descartes, and Leibniz. The contradiction between a concept (i.e. a rigorously defined idea) and experience and the facts (their determinations) is a situation about which general logic has no right to say anything, because then it is a question already of an act of subsuming facts under the definition of a concept and not of disclosures of the sense that was previously contained in the concept. (For example, if I affirm that 'all swans are white', then, having seen a bird identical in all respects except colour with my idea of a swan, I shall be faced with a

difficulty, which general logic cannot help me to resolve in any way. One thing is clear, that this bird will not be subsumed under my concept ‘swan’ without contradiction, and I shall be obliged to say: it is not a swan. If, all the same, I recognise it as a swan, then the contradiction between the concept and the fact will already be converted into a contradiction between the determinations of the concept, because the subject of the judgment (swan) will be defined through two mutually exclusive predicates (‘white’ and ‘not white’). And that is already inadmissible and equivalent to recognition that my initial concept was incorrectly defined, and that it must be altered, in order to eliminate the contradiction.)

So that every time the question arises of whether or not to subsume a given fact under a given concept, the appearance of a contradiction cannot be taken at all as an index of the accuracy or inaccuracy of a judgment. A judgment may prove to be true simply because the contradiction in the given case ***demolishes*** the initial concept, and reveals its contradictoriness, and hence its falsity. That is why one cannot apply the criteria of general logic unthinkingly where it is a matter of experimental judgments, of the acts of subsuming facts under the definition of a concept, of acts of concretising an initial concept through the facts of experience. For in such judgments the initial concept is not simply explained but has new determinations added to it. A synthesis takes place, a uniting of determinations, and not analysis, i.e. the breaking down of already existing determinations into details.

All judgments of experience, without exception, have a synthetic character. The presence of a contradiction in the make-up of such a judgment is consequently a natural and inevitable phenomenon in the process of making a concept more precise in accordance with the facts of experience.

To put it another way, general logic has no right to make recommendations about the capacity of a judgment since this capacity has the right to subsume under the definition of a concept those facts that directly and immediately ***contradict*** that definition.

Any empirical concept is therefore always in danger of being refuted by experience, by the first fact that strikes the eye. Consequently, a judgment of a purely empirical character, i.e. one in which an empirically given, sensuously contemplated thing or object functions as subject (e.g. our statement about swans), is true and correct only with the obligatory reservation: 'All swans ***that have so far come within our field of experience*** are white'. Such a statement is indisputable, because it does not claim to apply to any individual things of the same kind that we have not yet been able to see. And further experience has the right to correct our definitions and to alter the predicates of the statement.

Our theoretical knowledge is constantly coming up against such difficulties in fact, and always will.

But if that is so, if science develops only through a constant juxtaposition of concepts and facts, through a constant and never ending process of resolving the conflict that arises here again and again then the problem of the theoretical scientific concept is sharply posed immediately. Does a theoretical scientific generalisation (concept), claiming universality and necessity, differ from any empirical, inductive 'generalisation'? (The complications that arise here were wittily described a century or more later by Bertrand Russell in the form of a fable. Once there was a hen in a hen-coop. Every day the farmer brought it corn to peck, and the hen certainly drew the conclusion that appearance of the farmer was linked with the appearance of corn. But one fine day the farmer appeared not with corn but with a knife, which convincingly

proved to the hen that there would have been no harm in having a more exact idea of the path to a scientific generalisation.)

In other words, are such generalisations possible as can, despite being drawn from only fragmentary experience relative to the given object, nevertheless claim to be concepts providing scientific ***prediction***, i.e., to be extrapolated with assurance to future experience about the self-same object (taking into consideration, of course, the effect of the diverse conditions in which it may be observed in future)? Are concepts possible that express not only and not simply more or less chance common attributes, which in another place and another time may not be present, but also the 'substance' itself, the ***very 'nature' of the given kind of object***, the law of their existence? That is to say, are such determinations possible, in the absence of which the very object of the given concept is absent (impossible and unthinkable), and when there is already another object, which for that very reason is competent neither to confirm nor to refute the definition of the given concept? (As, for example, consideration of a square or a triangle has no bearing on our understanding of the properties of a circle or an ellipse, since the definition of the concept 'circumference of a circle' contains only such predicates as strictly describe the boundaries of the given kind of figure, boundaries that it is impossible to cross without passing into another kind). The concept thus presupposes such 'predicates' as cannot be eliminated (without eliminating the object of the given concept itself) by any future, 'any possible' (in Kant's terminology) experience.

So the Kantian distinction between purely empirical and theoretical scientific generalisations arises. The determinations of concepts must be characterised by universality and necessity, i.e. must be given in such a way that they cannot be refuted by any future experience.

Theoretical scientific judgments and generalisations, unlike purely empirical ones, in any case claim to be universal and necessary (however the metaphysical, psychological, or anthropological foundations of such claims are explained), to be confirmable by the experience of everybody of sound mind, and not refutable by that experience. Otherwise all science would have no more value than the utterances of the fool in the parable who produces sententious statements at every opportune and inopportune moment that are only pertinent and justified in strictly limited circumstances, i.e. thoughtlessly uttering statements applicable only on particular occasions as absolutes and universals, true in any other case, in any conditions of time and place.

The theoretical generalisations of science (and judgments linking two or more) have to indicate not only the definition of the concept but also the whole fullness of the conditions of its applicability, universality, and necessity. But that is the whole difficulty. Can we categorically establish that we have listed the whole series of necessary conditions? Can we be sure that we have included only the really necessary conditions in it? Or have we perhaps included superfluous ones, not absolutely necessary?

Kant remained open on this question, too; and he was right, since there is always the chance of a mistake here. In fact, how many times science has taken the particular for the general. In any case it is clear that ‘general’, i.e. purely formal, logic has no right here either to formulate a rule making it possible to distinguish the simply general from the ***universal***; to distinguish that which has been observed ***up to now*** from that which will be observed ***in the future***, however long our experience goes on for and however broad the field of facts that it embraces. For the rules of general logic judgments of the type of ‘all swans are white’ are quite indistinguishable from statements of the type of ‘all bodies are extended’, because the difference in them consists not in the form of the judgment but exclusively in the content and origin of the concept

embraced in it. The first is empirical and preserves its full force only in relation to experience already past (in Kant's parlance it is only true *a posteriori*); the second claims to a greater force, to be correct also in relation to the future, and to any possible experience regarding natural bodies (in Kant's parlance it is true *a priori*, i.e. prior to, before being tested by experience). For that reason we are convinced (and science lends our conviction the character of an apodictic affirmation) that however far we travelled in space and however deep we penetrated into matter we would never and nowhere encounter a 'natural body' that refuted our conviction, i.e. 'a body without extension'.

Why? Because there cannot be a body without extension in nature? To answer thus, Kant said, would be impudent. All we can say is the following: if, even in the infinite universe, such remarkable bodies did exist, they could never, in any case, come within our field of vision, within our field of experience. And if they could, then they would be perceived by us as extended, or would not be perceived at all. For such is the structure of our organs of perception that they can only perceive things in the form of space, only as extensions and continuities (in the form of time).

It may be said that they are such 'in themselves'; Kant did not consider it possible to deny that, or to assert it. But 'for us' they are precisely such, and cannot be otherwise, because then they would not in general be part of our experience, would not become objects of experience, and therefore would not serve as the basis for scientific statements and propositions, for mathematics, physics, chemistry, and other disciplines.

The spatial-temporal determinations of things (the modes of describing them mathematically) are thus rescued from danger of refutation by any possible experience, because they are precisely true on condition of that very experience being possible.

All theoretical propositions as such (i.e. all statements linking two or more determinations together) acquire a ***universal*** and ***necessary*** character and no longer need to be confirmed by experience. That is why Kant defined them as *a priori*, synthetic statements. It is by virtue of this character of theirs that we can be quite confident that two times two are four and not five or six not only on our sinful earth but also on any other planet; that the diagonal of a square will be just as incommensurate with its sides; and that the laws discovered by Galileo, Newton, and Kepler will be the same in any corner of the Universe as in the part investigated by us. Because only and exclusively *universal* and *necessary* definitions (in the sense explained above), predicates of the concept, are linked together (synthesised) in these propositions.

But if the main problem that science comes up against proves not to be analytical judgments but synthetic ones, and general logic is only competent to judge analytical correctness, then we must inevitably conclude that there must be a special logic, apart from general logic, having to do only with theoretical applications of the intellect, with the rules of producing theoretical (in Kant's parlance, *a priori*, synthetic) judgments, i.e. judgments that we are entitled to appraise as universal, necessary, and therefore objective.

'When we have reason to consider a judgment necessarily universal ... we must consider it objective also, that is, that it expresses not merely a reference of our perception to a subject, but a quality of the object. For there would be no reason for the judgments of other men necessarily agreeing with mine, if it were not the unity of the object to which they all refer, and with which they accord; hence they must all agree with one another.'

True, we still do not know anything about the thing in itself, i.e. outside the experience of all people in general; but that, in the experience of all

existing and future people organised like ourselves, it will necessarily look exactly the same (and therefore anybody will be able to test the correctness of our statement) a theoretical judgment must guarantee.

Hence Kant also drew the conclusion that there must be a logic (or rather a section of logic) that dealt specially with the principles and rules of the theoretical application of thought or the conditions of applying the rules of general logic to the solution of special theoretical problems, to acts of producing universal, necessary, and thus objective judgments. This logic was still not entitled, unlike general logic, to ignore the difference between knowledge (ideas) in content and origin. It could and must serve as an adequate canon (if not as an *organon*) for thinking that laid claim to the universality and necessity of its conclusions, generalisations, and propositions. Kant conferred the title of transcendental logic on it, i.e. the logic of truth.

The centre of attention here naturally turned out to be the problem of what Kant called the intellect's synthetic activity, i.e. the activity by which new knowledge was achieved, and not ideas already existing in the head clarified. 'By ***synthesis***, in its most general sense,' he said, 'I understand the act of putting different representations together and of grasping what is manifold in them in one (act of) knowledge.' Thus he assigned synthesis the role and 'sense' of the fundamental operation of thinking, preceding any analysis in content and in time. Whereas analysis consisted in act of arranging ready ideas and concepts, synthesis served as an act of ***producing*** new concepts. And the rules of general logic had a very conditional relation to that act, and so in general to the original, initial forms of the working of thought.

In fact, Kant said, where reason had not previously joined anything together there was nothing for it to divide and 'before we analyse our representations, the representations must themselves be given, and

therefore as regards content no concepts can arise by way of analysis.' So the original, fundamental, logical forms, it far spired, were not the principles of general logic, not the fundamental principles of analytical judgments (i.e. not the law of identity and the principle of contradiction), but only universal forms, schemas, and means of ***uniting*** various ideas into the body of some new idea, schemas ensuring ***unity of diversity***, means of identifying the different and uniting the heterogeneous.

Thus, notwithstanding the formal order of his exposition, and despite it, Kant in essence affirmed that the really universal initial and fundamental logical forms were not those at all that were considered such by traditional formal logic, but that these were rather the 'second storey' of logical science, and so derivative, secondary, and true only insofar as they agreed with the more universal and important, with the propositions relating to the ***synthesis*** of determinations in the composition of a concept and judgment.

It was clearly a complete revolution in views on the subject matter of logic as the science of thought. Not enough attention is usually paid to this point in expounding Kant's theory of thought, although it is here that he proved to be the real progenitor of a fundamentally new dialectical stage in the development of logic as a science. Kant was the first to begin to see the main ***logical*** forms of thinking in ***categories*** thus including everything in the subject matter of logic that all preceding tradition had put into the competence of ontology and metaphysics, and never into that of logic.

The union of representations in one consciousness is judgment. Thinking therefore is the same as judging, or referring representations to judgments in general. Hence judgments are either merely subjective, when representations are referred to a consciousness in one subject only, and united in it, or objective, when they are united in a consciousness generally, that is, necessarily. The logical functions of all judgments are

but various modes of uniting representations in consciousness But if they serve for concepts, they are concepts of their necessary union in a consciousness, and so principles of objectively valid judgments.

Categories are also ‘principles of objectively valid judgements’. And just because the old logic had turned up its nose at investigating these fundamental logical forms of thinking, it could neither help the movement of theoretical, scientific knowledge with advice nor tie up the loose ends in its own theory. ‘I have never been able to accept the interpretation which logicians give of judgment in general,’ Kant said. ‘It is, they declare, the representation of a relation between two concepts. I do not here dispute with them as to what is defective in this interpretation that in any case it applies only to ***categorical*** not to hypothetical and disjunctive judgments (the two latter containing a relation not of concepts but of judgments), an oversight from which many troublesome consequences have followed. I need only point out that the definition does not determine in what the asserted r***elation*** consists.’

Kant clearly posed the task of understanding categories as logical units, and of disclosing their logical functions in the process of producing and transforming knowledge. True, as we shall see below, he also displayed an almost uncritical attitude to the definitions of the categories borrowed by logic from ontology. But the problem was posed: the definitions of categories were understood as logical (i.e. universal and necessary) schemas or the principles of linking ideas together in ‘objective’ judgments.

Categories were thus those universal forms (schemas) of the activity of the subject by means of which coherent experience became possible in general, i.e. by which isolated perceptions were fixed in the form of knowledge: ‘...Since experience is knowledge by means of connected perceptions, the ***categories*** are conditions of the possibility of experience,

and are therefore valid *a priori* for all objects of experience. Any judgment, therefore, that claimed to universal significance, always overtly or covertly included a ***category*** :'we cannot think an object save through categories.

And if logic claimed to be the science of thinking it must also develop just this doctrine of categories as a coherent system of categorial determinations of thought. Otherwise it simply had no right to call itself the science of thought. Thus it was Kant (and not Hegel, as is often thought and said) who saw the main essence of logic in categorial definitions of knowledge, and began to understand logic primarily as the systematic exposition of categories, universal and necessary concepts characterising an object in general, those very concepts that were traditionally considered the monopoly of metaphysical investigations. At the same time, and this is linked with the very essence of Kant's conception, categories were nothing other than universal forms (schemas) of the cognitive activity of the subject, purely logical forms of thinking understood not as a psychic act of the individual but a 'generic' activity of man, as the impersonal process of development of science, as the process of the crystallising out of universal scientific knowledge in the individual consciousness.

Kant, not without grounds, considered Aristotle the founder of this understanding of logic, that same Aristotle on whom, following mediaeval tradition, responsibility had been put for the narrow, formal understanding of the boundaries and competence of logic, though in fact it was not his at all. Kant, however, reproached Aristotle for not having given any 'deduction' of his table of categories, but simply only setting out and summing up those categories that already functioned in the existing consciousness of his time. The Aristotelean list of categories therefore suffered from 'empiricism'. In addition, and on Kant's lips the reproach sounds even more severe, Aristotle, not having been content with

explaining the logical function of categories, had also ascribed a ‘metaphysical meaning’ to them, explaining them not only as logical (i.e. theoretical cognitive) schemes of the activity of the mind but also as universal forms of existence, universal determinations of the world of things in themselves, that is to say he ‘hypostatised’ the purest logical schemas as metaphysics, as a universal theory of objectivity as such.

Kant thus saw Aristotle’s main sin as having taken the forms of thinking for the forms of being or existence, and so having converted logic into metaphysics, into ontology. Hence also the task of having, in order to correct Aristotle’s mistake, to convert metaphysics into logic. In other words Kant still saw the real significance of Aristotle, through the converting prism of his initial precepts, as the ‘father of logic’ and understood that Aristotle was such in his capacity as author of the *Metaphysics*. So Kant once and for all cut the roots of the mediaeval interpretation both of Aristotle and of logic, which had seen the logical doctrine of the Stagirite only in the texts of the *Organon*. This unnatural separation of logic from metaphysics, which in fact was due not to Aristotle at all but to the Stoics and Scholastics, acquired the force of prejudice in the Middle Ages, but was removed and overcome by Kant.

Kant did not give his system of categories in the *Critique of Pure Reason*, but only posed the task of creating one in general fashion, ‘since at present we are concerned not with the completeness of the system, but only with the principles to be followed in its construction...’. He also did not set out the logic, but only the most general principles and outlines of its subject matter in its new understanding, its most general categories (quantity, quality, relation, and modality, each of which was made more concrete in three derivatives). Kant considered that the further development of the system of logic in the spirit of these principles no longer constituted a special work: ‘... it will be obvious that a full glossary, with all the requisite explanations, is not only a possible, but an

easy task.' '... It can easily be carried out, with the aid of the ontological manuals for instance, by placing under the category of causality the predicables of force, action, passion; under the category of community the predicables of presence, resistance; under the predicaments of modality, the predicables of coming to be, ceasing to be, change, etc.'

Here again, as was the case with general logic, Kant displayed an absolutely ***uncritical*** attitude to the theoretical baggage of the old metaphysics, and to the determinations of categories developed in it, since he reduced the business of creating the new logic to very uncritical rethinking, to a purely formal transformation of the old metaphysics (ontology) into logic. In practice it sometimes resulted simply in the renaming of 'ontological' concepts as 'logical'. But the very carrying out of the task posed by Kant very quickly led to an understanding that it was not so simple to do, since what was required was not a formal change but a very serious and far reaching, radical transformation of the whole system of philosophy. Kant himself still did not clearly and completely realise this fact; he had only partially detected the dialectical contradictions of the old metaphysics, in the form of the famous four antinomies of pure reason. A start, however, had been made.

According to Kant categories were purely logical forms, schemas of the activity of the intellect linking together the facts of sensuous experience (perceptions) in the form of concepts and theoretical (objective) judgments. In themselves categories were empty, and any attempt to use them as other than logical forms of the generalisation of empirical facts led one way or the other only to balderdash an(l logomachy. Kant expressed this idea in his own manner, affirming that it was impossible in any case to understand categories as abstract determinations of things in themselves as they existed outside the consciousness of people and outside experience. They characterised, in a universal (abstract-universal) way only the ***conceivable*** object, i.e. the external world ***as and how we of***

necessity thought of it, as and how it was represented in consciousness after being refracted through the prism of our sense organs and forms of thinking. Transcendental logic, therefore, the logic of truth, was logic, and only logic, only the doctrine of thinking. Its concepts (categories) told us absolutely nothing about how matters stood in the world outside experience, whether in the world of the 'transcendental' outside the bounds of experience, there was causality, necessity, and chance, quantitative and qualitative differences, a difference in the probability and inevitability of an event occurring, and so on and so forth. That question Kant thought it impossible to answer; but in the world as given to us by experience matters stood exactly as logic pictured them, and science needed nothing more.

Science was therefore always and everywhere obliged to discover causes and laws, to differentiate the probable from the absolutely inevitable, to explain and numerically express the degree of probability of any particular event happening, and so on. In the world with which science was concerned there was no need, even as hypothetically assumed factors, for 'unextended' or 'eternal' factors (i.e. taken outside the power of the categories of space and time), 'incorporeal' forces, absolutely unalterable 'substances', and other accessories of the old metaphysics. The place of the old ontology must now be taken not by some one science, even though new in principle and clarified by criticism, but only the whole aggregate of real experimental sciences mathematics, mechanics, physics, chemistry, celestial mechanics (i.e., astronomy), geology, anthropology, physiology. Only all the existing sciences (and those that might arise in the future) together, generalising the data of experience by means of the categories of transcendental logic, were in a position to tackle the task that the old ontology had monopolised.

To ***tackle*** it Kant, however, emphasised, but by no means to ***solve*** it. They could not solve it; for it was insoluble by the very essence of the

matter and not at all because the experience on which such a picture of the world as a whole was built was never complete, and not because science, developing with time, would discover more and more new fields of facts and correct its own propositions, thus never achieving absolute finality in its constructions of the world in concepts. If Kant had argued like that he would have been absolutely right; but with him this quite true thought acquired a rather different form of expression, and was converted into a basic thesis of agnosticism, into an affirmation that it was impossible in general to construct a unified, scientifically substantiated picture of the world even relatively satisfactory for a given moment of time.

The trouble was that any attempt to construct such a picture inevitably collapsed at the very moment of being made, because it was immediately smashed to smithereens by antinomies and immanent contradictions, by the shattering forces of dialectics. The picture sought would inevitably be self-contradictory, which was the equivalent for Kant of its being ***false***. Why was that so? The answer is in the chapter of the *Critique of Pure Reason* devoted to analysis of the logical structure of reason as the highest synthetic function of the human intellect.

Another task, it turned out, remained outside the competence of either general or transcendental logic, a task with which scientific understanding was constantly in collision, that of the theoretical synthesis of all the separate ‘experimental’ statements that made up a single theory developed from a single common principle. Now the job already was not to generalise, i.e. to unite and link together, the sensuously contemplated, empirical facts given in living contemplation, in order to obtain concepts, but the ***concepts themselves***. It was no longer a matter of schemas of the synthesis of sensuous facts in reason, but of the unity of reason itself and the products of its activity in the structure of a theory, in the structure of a system of concepts and judgments. Generalising of the factual data by means of a concept, and the generalising of concepts by means of a

theory, by means of an ‘idea’ or general guiding principle, were of course quite different operations. And the rules for them must be different.

There is therefore yet another storey in Kant’s logic, a kind of ‘metalogic of truth’ bringing under its critical control and surveillance not individual acts of rational activity but all reason as a whole: Thinking with a capital ‘T’, so to say; thinking in its highest synthetic functions and not separate and partial operational schemas of synthesis.

The striving of thought to create a single, integral theory is natural and ineradicable. It cannot be satisfied, and does not wish to be, by simple aggregates, simple piling up of partial generalisations, but is always striving to bring them together, to link them together by means of general principles. It is a legitimate striving, and since it is realised in activity and thus appears as a separate power, Kant called it reason in distinction from understanding. Reason is the same as understanding, only it is involved in the solving of a special task, explanation of the absolute unity in diversity, the synthesis of all its schemas and the results of their application in experience. Naturally it also operates there according to the rules of logic, but in resolving this task, thought, though exactly observing all the rules and norms of logic (both general and transcendental) without exception, still inevitably lands in a contradiction, in self-destructing. Kant painstakingly showed that this did not happen as a consequence of slovenliness or negligence in any thinking individuals at all, but precisely because the individuals were absolutely guided by the requirements of logic, true, where its rules and norms were powerless and without authority. In entering the field of reason, thinking invades a country where these laws do not operate. The old metaphysics struggled for whole millennia in hopeless contradictions and strife because it stubbornly tried to do its job with unsuitable tools.

Kant set himself the task of discovering and formulating the special ‘rules’ that would subordinate the power of thinking (which proved in fact to be its incapacity) to organise all the separate generalisations and judgments of experience into a unity, into the structure of an integral, theoretical schema, i.e. to establish the legislation of reason. Reason, as the highest synthetic function of the intellect, ‘endeavours to carry out the synthetic unity, which is thought in the category, up to the completely unconditioned’. In this function thinking strives for a full explanation of all the conditions in which each partial generalisation of understanding (each concept and judgment) can be considered justified without further reservations. For only then would a generalisation be fully insured against refutation by new experience, i.e. from contradiction with other, just as correct generalisations.

The claim to absolutely complete, unconditional synthesis of the existing determinations of a concept, and so of the conditions within which these determinations are unreservedly true is exactly equivalent to a claim to understand things in themselves. In fact, if I risk asserting that subject A is determined by predicate B in its ***absolute totality***, and not just in part that existed or might exist in our field of experience, I remove the very limitation from my assertion (statement) that transcendental logic has established for all experimental judgments; that is to say, I am no longer stating that it is true only in conditions imposed by our own forms of experience, our modes of perception, schemas of generalisation, and so on. I begin to think that the statement ascribing predicate B to subject A is already true not only within the conditions of experience but outside them, that it relates to A not only as the object of any possible experience but also irrespective of that experience, and defines A as an object existing in itself.

That means to remove ***all*** the limitations governing it from the generalisation, including the conditions imposed by experience. But all

the conditions cannot be removed, ‘for the conception of the absolute totality of conditions is not applicable in any experience, since no experience is unconditioned’. This illegitimate *demarche* of thinking Kant called transcendental application of reason, i.e. the attempt to affirm that things in themselves are such as they appear in ***scientific*** thinking, that the properties and predicates we attribute to them as objects of any possible experience also belong to them when they exist in themselves and are not converted into objects of somebody’s experience (perceptions, judgments, and theorising).

Such a transcendental application of understanding entails contradictions and antinomies. A logical contradiction arises within reason itself, disrupting it, breaking up the very form of thinking in general. A logical contradiction is also an index for thought indicating that it has taken on the solution of a problem that is in general beyond its strength. A contradiction reminds thought that it is impossible to grasp the ungraspable (boundless).

Understanding falls into a state of logical contradiction (antinomy) here not only because, and even not so much because, experience is always unfinished, and not because a generalisation justified for experience as a whole has been drawn on the basis of partial experience. That is just what reason can and must do, otherwise no science would be possible. The matter here is quite different; in trying fully to synthesise all the theoretical concepts and judgments drawn from past experience, it is immediately discovered that the ***experience already past*** was itself internally antinomic if it of course was taken as a whole and not some arbitrarily limited aspect or fragment of it in which, it goes without saying, contradiction may be avoided. And the past experience is already antinomic because it includes generalisations and judgments synthesised according to schemas of categories that are ***not only different*** but are directly opposite.

In the sphere of understanding, as transcendental logic showed, there were pairs of mutually opposing categories, i.e. schemas of the action of thinking having diametrically opposite directions. For example, there is not only a category of identity orienting the intellect to discovering the same invariant determinations in various objects, but also its polar category of difference, pointing to exactly the opposite operation, to the discovery of differences and variants in objects seemingly identical. In addition to the concept of necessity there is the concept of chance, and so on. Each category has another, opposite to it and not unitable with it without breaking the principle of contradiction. For clearly, difference is not identity, or is nonidentity, while cause is not effect (is non-effect). True, both cause and effect are subsumed purely formally under one and the same category of interaction, but that only means that a higher category embracing both of them is itself subordinated to the law of identity, i.e. ignores the difference between them. And any phenomenon given in experience can always be comprehended by means both of one and of another categorial schema directly opposite to it. If, for example, I look on some fact as an effect, my search is directed to an infinite number of phenomena and circumstances ***preceding*** the given fact, because behind each fact is the whole history of the Universe. If, on the contrary, however, I wish to understand a given fact as a cause, I shall be forced to go into the chain of phenomena and facts ***following*** it in time, and to go further and further away from it in time with no hope of encountering it again anywhere. Here are two mutually incompatible lines of search, never coinciding with one another, two paths of investigating one and the same fact. And they will never converge because time is infinite at both ends, and the causal explanation will go further and further away from the search for effects.

Consequently, relative to any thing or object in the Universe, two mutually exclusive points of view can be expressed, and two diverging

paths of investigation outlined, and therefore two theories, two conceptions developed, each of which is created in absolute agreement with all the requirements of logic and with all the facts (data of experience) relating to the matter, but which nevertheless, or rather precisely because of this, cannot be linked together within one theory without preserving and without reproducing this same logical contradiction within it. The tragedy of understanding is that it itself, taken as a whole, is immanently contradictory, containing categories each one of which is as legitimate as the other, and whose sphere of applicability ***within the framework of experience*** is not limited to anything, i.e. is as wide as experience itself. In relation to any object, therefore, two (at least, of course) mutually opposite theories inevitably must always arise and develop, before, now, and henceforth, forevermore, each of which advances a fully logical claim to be universal, to be correct in relation to all experience as a whole.

The antinomies could be eliminated in one way only, by discarding from logic exactly half of its categorial schemas of synthesis, recognising one category in each pair as legitimate and correct, and banning the other from use in the arsenal of science. That is what the old metaphysics did. It, for example, proclaimed chance or fortuity a purely subjective concept, a characteristic of our ignorance of the causes of phenomena, and so converted necessity into the sole objective categorial schema of a judgment, which led to recognition of the fatal inevitability of any fact, however minute and ridiculous.

That is why Hegel somewhat later called this method of thinking ***metaphysical***. It was, in fact, characteristic of the old, pre-Kantian metaphysics, delivering itself from internal contradictions simply by ignoring half of all the legitimate categories of thought, half of the schemas of judgments with objective significance; but at the same time the question arises of which category in the polar pair to prefer and keep,

and which to discard and declare a ‘subjective illusion’. Here, Kant showed, there was not, and could not be, any objective basis for choosing. It was decided by pure arbitrariness, by individual preference. Both metaphysical systems were therefore equally correct (both the one and the other went equally with the universal principle) and equally subjective, since each of them denied the objective principle contrary to it.

The old metaphysics strove to organise the sphere of reason directly on the basis of the law of identity and of the principle of contradiction in determinations. The job was impracticable in principle because, if categories were regarded as the universal predicates necessarily inherent in some subject, then this subject must be the thing in itself; but the categories, considered as the predicates of one and the same subject of a judgment, prove to contradict ***one another*** and to create a paradoxical situation. And then the statement fell under the principle of contradiction, which Kant formulated thus: ‘...No predicate contradictory of a thing can belong to it....’ So, if I determine a thing in itself through a category, I still have no right, without breaking the principle, to ascribe the determinations of the opposing category to it.

Kant’s conclusion was this: quite rigorous analysis of any theory claiming to be an unconditionally full synthesis of all determinations (all the predicates of one and the same thing in itself, claiming the unconditional correctness of its own judgments, will always discover more or less artfully disguised antinomies in the theory.

Understanding, clarified by criticism, i.e. conscious of its legitimate rights and not claiming any sphere of the transcendental banned to it, will always strive for an unconditionally full synthesis as the highest ideal of scientific knowledge, but will never permit itself to assert that it has already achieved such a synthesis, that it has finally determined the thing-in-itself through a full series of its universal and necessary predicates, and

so given a full list of the conditions of the truthfulness of its concept. The age-old theoretical opponents should therefore, instead of waging endless war to the death, come to some kind of peaceful co-existence between them, recognising the equal rights of each other to relative truth, to a relatively true synthesis. They should understand that, in relation to the thing-in-itself, they are equally untrue, that each of them, since he does not violate the principle of contradiction, possesses only part of the truth, leaving the other part to his opponent. Conversely, they are both right in the sense that understanding as a whole (i.e. reason) always has not only different interests within it but also opposing ones, equally legitimate and of equal standing. One theory is taken up with the identical characteristics of a certain range of phenomena, and the other with their differences (the scientific determinations, say, of man and animal, man and machine, plant and animal). Each of the theories realises in full the legitimate, ***but partial*** interest of reason, and therefore neither the one nor the other, taken separately, discloses an objective picture of the thing as it exists outside of and prior to consciousness, and independently of each of these interests. And it is impossible to unite these theories into one without converting the antinomic relation between them into an antinomic relation between the concepts within one theory, without disrupting the deductive analytical schema of its concepts.

What should ‘critique of reason’ give to scientific understanding? Not, of course, recipes for eliminating dialectics from knowledge; that is impossible and impracticable because knowledge as a whole is always obtained through polemic, through a struggle of opposing principles and interests. It is therefore necessary that the warring parties in science will be fully self-critical, and that the legitimate striving to apply its principle rigorously in investigating the facts will not be converted into paranoiac stubbornness, into dogmatic blindness preventing the rational kernel in the theoretical opponent’s statements from being seen. Criticism of the

opponent then becomes a means of perfecting one's own theory, and helps stipulate the conditions for the correctness of one's own judgments more rigorously and more clearly, and so on and so forth.

Thus the 'critique of reason' and its inevitable dialectic were converted by Kant into the most important branch of logic, since prescriptions were formulated in it capable of rescuing thought from the bigoted dogmatism into which understanding inevitably fell when it was left to its own devices (i.e. thinking that knew and observed the rules of general and transcendental logic and did not suspect the treacherous pitfalls and traps of dialectics), and also from the natural complement of this dogmatism, scepticism.

After this broadening of the subject matter of logic, after the inclusion in it both of the categorial schemas of thinking and principles of constructing theories (synthesis of all concepts), and after the comprehension of the constructive and regulative role and function of ***ideas*** in the movement of knowledge, this science acquired the right for the first time to be, and to be called, the ***science of thinking***, the science of the universal and necessary forms and patterns of real thought, of the processing of the facts of experience and the facts of contemplation and representation. In addition, dialectics was also introduced into the structure of logic, as the most important branch crowning the whole, that same dialectics that had seemed, before Kant, either a 'mistake', only a sick state of the intellect, or the result of the casuistic unscrupulousness and incorrectness of individual persons in the handling of concepts. Kant's analysis showed that dialectics was a necessary form of intellectual activity, characteristic precisely of thinking concerned with solving the highest synthetic problems and with constructing a theory claiming universal significance, and so ***objectivity*** (in Kant's sense). Kant thus weaned dialectics, as Hegel put it, of its seeming arbitrariness and showed its absolute necessity for theoretical thinking.

Since it was the supreme synthetic tasks that were pushed to the foreground in the science of that period, the problem of contradiction (the dialectics of determinations of the concept) proved to be the central problem of logic as a science. At the same time, since Kant himself considered the dialectical form of thought a symptom of the futility of scientists' striving to understand (i.e. to express in a rigorous system of scientific concepts) the position of things outside their own Ego, outside the consciousness of man, the problem also rapidly acquired ideological significance. The fact is that at that time the development of science was generating ever tenser conflicts between its theories, ideas, and conceptions. The Kantian 'dialectic' did not in fact indicate any way out, no path for ***resolving*** conflicts of ideas. It simply stated in general form that conflict of ideas was the natural state of science, and counselled ideological opponents everywhere to seek some form or other of compromise according to the rule of live and let live, to hold to their truth but to respect the truth of the other man, because they would both find themselves ultimately in the grip of subjective interests, and because objective truth common for all was equally inaccessible to both of them.

In spite of this good advice, however, not one of the really militant theories of the time wanted to be reconciled with such a pessimistic conclusion and counsel, and orthodoxy became more and more frantic in all spheres as the revolutionary storm drew nearer. When, in fact, it broke, Kant's solution ceased to satisfy either the orthodox or the revolutionaries. This change of mood was also reflected in logic in the form of a critical attitude to the inconsistency, reticence, and ambiguity of the Kantian solution.

These moods were expressed most clearly of all in the philosophy of Fichte; through it the 'monistic' strivings of the times to create a single theory, a single sense of law, a single system of all the main concepts on

life and the world, also burst into the sphere of logic, into the sphere of understanding of the universal forms and patterns of developing thought.