MARXIST DIALECTICS

OF

NATURE

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## APPENDIX

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I. The subject of the philosophy of nature is ens mobile.

II. Motion properly so called takes place only between contraries.

III. The external senses do not terminate with a species expressa but with the object in its physical presence.

IV. The speculative sciences are distinguished according to their formal objects.

V. Analogy properly so called is divided into analogy of attribution and analogy of proper proportionality.
INTRODUCTION

Marx' eleventh thesis on Feuerbach states that "The philosophers have only interpreted the world differently; the point is, to change it." We, too, hold that practical philosophy aims at action and making. We even hold that the practical virtue of prudence is more necessary than theoretical philosophy. Does this mean that we might agree with the Marxists on the general nature of philosophy itself?

In Marxism (1), the interpretation of the world can be no more than instrumental to action and making, like the mechanics to the mechanic; the purpose of action and making are the enjoyment, in this life, of material goods. This temporary enjoyment has no further aim. The very notion of purpose is devoid of meaning outside the realm of man. Hence, when the Marxist speaks of his philosophy as "complete and harmonious, providing men with a consistent view of the universe" (2), it seems that the whole of this philosophy must be viewed as centered upon, and in the perspective of, human enjoyment of material goods. Philosophy, then, becomes a world outlook or Weltanschauung only in a very narrow sense, which can be best understood by comparison with what the outlook of a brute animal would be if it were endowed with the faculty of conceiving its own plan for its nest, hive or dam. The end of man remains
within the same genus. It is materially more elaborate than that of the brute, but the final result is as common and certain as death.

Contrary to what the neophyte Marxist, J.B. S. Haldane, holds when he says "Marxism is not complete, not a system, and only in the second place theoretical" (3), the orthodox Marxist very definitely claims that his is a finished philosophy.

Marx' philosophy is a finished philosophical materialism, which has provided humanity, and especially the working class, with powerful instruments of knowledge. (4)

This complete philosophy, nevertheless, retains a rather fundamental distinction between what is called "dialectical materialism" and "historical materialism".

Dialectical materialism is the world outlook of the Marxist-Leninist party. It is called dialectical materialism because its approach to the phenomena of nature, its method of studying and apprehending them, is dialectical, while its interpretation of the phenomena of nature, its conception of these phenomena, its theory is materialistic. Historical materialism is the extension of the principles of dialectical materialism to the study of social life, an application of the principles of dialectical materialism to the phenomena of life of society, to the study of society and its history. (5)

Marxism claims completeness, not merely with respect to the world of nature, but with respect to the world of thought and action. It claims to account for the whole of human history. It sees in the earlier philosophies a mere groping for the truth that for the first time comes to full light in Marxism.
How does Marxism actually go about proving this simple completeness? This simple question confronts us with a very intricate problem. If the writings of Marx himself were to furnish us with an answer, the problem would be simple enough. The theory of Marxism would be a mere historical outgrowth of all past philosophy. The theory would not itself be strictly theoretical; it would not be universally analytical. As Marx says:

With me, on the contrary (referring to Hegel), the ideal is nothing else than the material world reflected by the human mind, and translated into forms of thought. (6)

The justification of theory must be sought in the changing material conditions of the material life of man, not in an absolute object, not in a speculative conformity of the mind with what is. That was the trouble with Feuerbach's materialism.

The chief defect of all hitherto existing materialism --- that of Feuerbach included --- is that the object, reality, sensuousness, is conceived only in the form of the object or contemplation (in the German Anschaunung) but not as human sensuous activity, practice, not subjectively. Thus it happened that the active side, in opposition to materialism, was developed by idealism --- but only abstractly, since of course, idealism does not know real sensuous activity as such. Feuerbach wants sensuous objects, really differentiated from the thought-objects, but he does not conceive human activity itself as activity through objects. Consequently, in the Essence of Christianity, he regards the theoretical attitude as the only genuinely human attitude, while practice is conceived and fixed only in its dirty-Jewish form of appearance. Hence he does not grasp the significance of "revolutionary" of practical-critical activity. (7)

Theory, then, can at no time be given an absolute status. Theory is a factual outgrowth. It needs no analyt-
ical justification. It is a historical fact, a fact of human history. In reality, the questions: "What is reality?" and "What should be done about it" are inseparable. Their separation is scholastic abstraction. Hence even the question: "What are the laws of nature, the principles governing the phenomena of nature?" is a purely scholastic question.

The question whether objective truth can be attributed to human thinking is not a question of theory but is a practical question. In practice man must prove the truth, i.e., the reality and power, the 'this-sidedness' of his thinking. The dispute over the reality or non-reality of thinking which is isolated from practice is a purely scholastic question. (8)

Practice is the purpose of theory. Hence practice precedes theory. Hence, the very question: "What is reality", even when asked for the purpose of action, is already the conditioned outgrowth of practice and is inseparable from sensuous activity.

But from this conception it follows that no purely objective judgment can be made, neither of things nor of thoughts. Things cannot be confronted absolutely, but only through practice and through essentially practical thought conditioned by matter. Hence, theory cannot bear upon nature absolutely, but only upon what nature now happens to be for man in the present material conditions of human life. From this it follows that the distinction mentioned by Stalin is not strictly Marxian: dialectical materialism cannot be a general theory of which historical materialism is but an application to society.
Rather the contrary is true: dialectical materialism is historical materialism: nature cannot be seen but through historical materialism. Neither Engel's, nor Lenin's nor Stalin's philosophy are strictly Marxian.

Marxist philosophy could not have remained strictly Marxian. Marxism could not resist the temptation and necessity of becoming more general, more objective; it had to justify itself to reason. It did not have the practical power to impose itself brutally. History explains this necessity: the elaboration of an absolute theory would not have been necessary if Marxism had not been compelled to convince reason of its truth, that is, if Marxism had been able to impose itself by "practical-critical activity", by the critique of arms.

In other words, Marxism had to bow to the natural demands of human reason. And this it did in Marx himself, for, as we shall see further on, Marx approved of Engel's work. In this Marx himself could not remain faithful to Marxianism.

Because of its strong emphasis on theory, Marxism is at the same time more intelligible and less reasonable than Marxianism. This may be clearly shown from Stalin's *Dialectical and Historical Materialism*. Every practical application to society is preceded by an absolute consideration concerning the very nature of things in general. Society is but an instance of the general, and
what it is and what we should do about it are stated as conclusions of more general principles reached without any reference to society (notwithstanding Stalin's warnings to the contrary).

In Marx's mind, historical materialism is complete in itself and needs no justification from more general principles. This means that, as far as the philosophy of the past is concerned, only that part of it which can be interpreted in the light of the material conditions of our time, can be accounted for. And even this cannot be accounted for objectively, nor does it have to be. And yet this restriction has not been carried out. Did Marx realize that, in accepting Engel's work, he was dangerously broadening his outlook into a philosophy which is, as it is in Stalin, first and above all a *Weltanschauung*, that is, a philosophy where theory can justify itself and be compared with another theory on the level of abstract thought?

The Marxist approach to the history of philosophy is very different from what it should be in Marxianism. Marxism today presents itself as a philosophy which may be compared with any other philosophy and confront it in the classical philosophical sense. This may be exemplified by Stalin's comparison between metaphysics and dialectics as well as by his comparison between idealism and materialism. From the strictly Marxian viewpoint, it is entirely too objective, and, what is more, much too dangerous. For
raises the question: "What is metaphysics?" or "What has hitherto been meant by that term?" In other words, it raises at least the question of historical truth in a non-Marxian sense. Stalin has to know and understand what the metaphysicians mean, whether he approves of them or not.

When Engels said that "The question of the relation of thinking to being, the relation of spirit to nature is the paramount question of the whole of philosophy" (9), he was being entirely too objective, as if, in strict Marxianism, being or thought could have an absolute meaning. Such statements are entirely unreasonable.

Marxism could not resist the necessity of becoming more intelligible at the expense of Marxian reasonableness. It could not resist the temptation to present itself as the strictly logical outgrowth of past philosophies. Even when Marxist history of philosophy makes reference to the social conditions at the time of the development of some given philosophy, the reference remains extrinsic. They will hold, for instance, that such a conception was not yet arrived at because the human mind was still under the domination of the feudal system, etc., but they suppose that there is an inner logic being temporarily halted by social conditions, actually tending to be itself as much as conditions allow. In Stalin, a faithful enough disciple, philosophies of the past are actually rejected for strictly
speculative reasons. From the strictly Marxian point of view a non-Marxian philosophy of the past could have been true insofar as it faithfully expressed the material conditions of human life at that time. Stalin himself will say that slavery was justified. At the same time he criticizes metaphysics as if it could never have been but false, as if it contradicted a reality reaching far beyond the Marxian closed system of historical materialism. Metaphysics is false, Stalin holds, because nature is not what metaphysics holds it to be.

Marxists now discuss past philosophers just as we discuss them. They confront theoretical problems concerning movement, quantity, etc. They attempt to justify their actions from the theoretical solution of these problems. In other words, Marxism has exposed itself both to Marxian criticism and to absolute criticism. Any statement made about a Marxist about Greek philosophy may now be submitted to the ordinary method of criticism. When they invoke the presocratics, or even Aristotle, we may now request proof that they have understood them. They can no longer confine themselves to purely dogmatic statements, for they have placed themselves in a position where they must give proof.

An extensive study of the early Greeks is important for two reasons. The first reason is that the Marxist claim a continuity with the ancient materialists, particularly with the
teaching of Heraclitus and Democritus.

Marxism is a world outlook. In brief, it is the contemporary materialism which represents the highest state of the world outlook, which began in ancient Greece under Democritus and the other Ionian thinkers which immediately preceded him. (10)

In his Dialectics of Nature Engels says:

The new conception of nature (the scientific) was complete in its main features; all rigidity was dissolved, all fixity dissipated, all particularity that had been regarded as eternal became transient, the whole of nature was shown as moving in eternal flux and cyclical course. Thus we have once again returned to the point of view of the great founders of Greek philosophy, the view that the whole of nature, from the smallest element to the greatest, from the grains of sand to suns, from protista to men, has its existence in eternal coming into being and passing away in ceaseless flux, in unresting motion and change, only with the essential difference that what for the Greeks was a brilliant intuition, is in our case the result of strictly scientific research in accordance with experience, and hence it also emerges in a much more definite and clear form. (11)

And in the Anti-Dühring he says:

Lorsque nous soumettons à l'examen de la pensée la nature, ou l'histoire de l'humanité, ou notre propre activité mentale, ce qui s'offre à nous tout d'abord c'est le tableau d'un enchevêtrement infini de relations, d'actions et réactions, ou rien ne demeure ce qu'il était, où il était, comme il était, où tout se meut, se transforme, devient et passe. Cette conception du monde primitive, naïve, mais objectivement exacte, est celle de l'ancienne philosophie grecque, et est d'abord clairement exprimée chez Héraclite : 'Tout est et en même temps n'est pas, car tout coule, tout est en métamorphose continuelle, en continuel devenir et finir'. (12)

The second reason why an extensive study of the ancients is undertaken is the importance of the Greeks in the growth of philosophy. Since our task is to study the Marxist philosophy of becom-
ing, that is, dialectical materialism, there is no better place to begin than with the men who were first confronted with the problem, with the men, who in attempting a solution, show us, at least, what the problem is.

In the second part of the thesis we shall give a presentation of the dialectics of nature where we shall see how the problem of becoming is explained on the basis of universal, theoretical Marxist principles.

In the final part we shall give an analysis of the Marxist doctrine, together with the Aristotelian teaching on the problem of becoming.

The principal sources for the historical part are the fragments of the early Greek philosophers, the English translation of which have been taken from Burnet's *Early Greek Philosophy* and from Hack's *God in Greek Philosophy*. Marxist doctrine has been taken from Marx himself (though the material here is not abundant), and particularly from the writings of Engels, Plekanov, Lenin and Stalin. Secondary sources include the lesser theorists who follow in the tradition of Marxist philosophy as taught today in Soviet Russia. The primary sources for our analysis of dialectical materialism are the works of Aristotle, together with the commentaries of Saint Thomas, and John of Saint Thomas.
To Mr. Charles de Koninck is due an immense dept of gratitude for giving so unstintingly of his time, for his encouragement, and particularly for his instruction without which I could never have done this work.
Since comparison and contrast are effective means for the clarification of any position, we shall begin our historical introduction with the doctrine of Parmenides, for it is he who is generally opposed by historians of philosophy to the Heraclitean doctrine of movement and becoming. And when the Marxists say that their philosophy has continuity with the philosophy of the ancient Greeks they most probably did not have in mind Parmenides, but rather men like Heraclitus and Empedocles and Democritus whose teaching on becoming and contrary principles bears a great extrinsic similarity with the teaching of dialectical materialism. We shall see to what extent the opposition between Parmenides and Heraclitus is justified.

Instead of beginning with the Parmenidean doctrine of knowledge, we shall begin with his teaching on Being and Becoming, for the problem of certitude is secondary to the problem of being and movement.

As we shall see in the following quotation, Parmenides understands the term Being or rather, What is, in such a full and absolute sense that it can only be one and immobile:

One path only is left for us to speak of, namely, that it is. In this path are very many tokens that what is is uncreated and in-
destructible; for it is complete, immovable and without end.
Nor was it ever, nor will it be; for now it is, all at once,
a continuous one. For what kind of origin for it wilt thou look
for? In what way and from what source could it have drawn
increase?...I shall not let thee say nor think that it came
from what is not; for it can neither be thought nor uttered
that anything is not. And, if it came from nothing, what need
could have made it arise later rather than sooner? Therefore
must it either be altogether or be not at all. Nor will the
force of truth suffer aught to arise besides itself from that
which is not. Wherefore Justice does not loose her fetters
and let anything come into being or pass away, but holds it
fast. Our judgment thereon depends on this: "Is it or is it
not" Surely it is adjudged, as it needs must be, that we are
to set aside the one way as unthinkable and nameless (for it
is no true way), and that the other path is real and true. Now,
then, can what is be going to be in the future? Or how could
it come into being? If it came into being, it is not; nor is
it if it is going to be in the future. Thus is becoming exting­
quished and passing away not to be heard of. Nor is it divisible,
since it is all alike, and there is no more of it in one place
than in another, to hinder it from hodling together, nor less
of it, but everything is full of what is. Wherefore it is wholly
continuous; for what is, is in contact with what is.

Moreover, it is immovable in the bonds of mighty chains, without
beginning and without end; since coming into being and passing
away have been driven arar, and true belief has cast them aside.
It is the same, and it rests in the self-sameplace. abiding in
itself. And thus it remaineth constà't in its place; for hard
necessity keeps it in the bonds of the limit that holds it fast
on every side. Wherefore it is not permitted to what is to be
infinite; for it is in need of nothing; while, if it were in­
finte, it would stand in need of everything. (13)

Now, in order to understand why Parmenides
denies becoming to this Being, it is necessary to see what he meant by
this Being that is uncreated and indestructible; complete, immovable,
and without end; which is all at once, a continuous one; indivisible,
and all alike, wholly continuous; without beginning and without end;
in need of nothing.
Surely, these attributes refer to divinity.

The Greeks were religious men. Their God had to be absolutely perfect, and the attributes that are here given to this one Being show both the perfection of Being in itself and also its eminent superiority to things in nature. God would not be God unless he were the absolutely perfect Being who could neither come to be nor pass away, nor change in any way. Except for several of the attributes which are derived from quantity, such as the continuous, the all in one place, we could apply these very same attributes to the God of our metaphysics. Even those names which seem to make God synonymous with the material universe are but the feeble human way of speaking about that Being which is absolutely beyond the imperfections of our universe.

The theological character of the Being of Parmenides is brought out when we compare this Being with the God of Xenophanes. The description is practically identical, leaving little room to doubt that both descriptions refer to one and the same.

There is one God, greatest among gods and men, not like the mortals in form or in thought...The one God abides ever in the same, never moving; nor is it fitting that he travel now in this direction and now in that. (14)

Throughout alike (μακρύνωσεν ὁμοιός); always a like (μίν ὁμοίον); coherent with all things (συνέχεσθαι τοῖς ἀλλοίων). (15)

Xenophanes says that the One God is neither infinite and indeterminate nor finite and determinate, since that which does not exist is the infinite and indeterminate, because it has no beginning or middle or end, and since it is the many that limit and determine each other. Similarly, he deprives the One God both of motion and of rest, since that which does not exist is the unmoved, because nothing else ever comes into it nor does it
go into anything else; and the things which are moved are those which are more than the one, for one thing changes into another. And so when Xenophanes says that the One God abides ever in the same, he does not mean that it abides in the sense of 'repose' which is the opposite of motion, but that it abides in a sense which does not refer either to motion or to rest. (16)

There is one difference between the wording of Xenophanes and that of Parmenides which is quite notable. Xenophanes says that God cannot be called Limited or Unlimited; while Parmenides says Being is Limited. Xenophanes denied that Limit or Without Limit were appropriate qualifications for God, because both Peras and Apeiron were regularly employed to explain the processes of physical change, and were actually substantial parts of these processes, and had been identified, consequently, with the changing world. The one God was absolutely above the world of physical change. Parmenides, on the other hand, used the word Limit in order to show that Being is absolutely separated from the world of Becoming. It is "locked off" from the world of becoming, and is unchangeable in itself.

The doctrine of Truth follows upon this conception of Being. In the Aristotelian teaching Science can only be about what is necessary, that is, about what is universal: what is everywhere and always. Hence, if being is taken for the most perfect Being, and Wisdom and Certainty for their most perfect type, Parmenides is far from talking nonsense. If we took this path of Truth, then there could be Truth only in the knowledge of such Being. For the truth of pure knowledge consists in the conformity of the intellect
with what is. Viewing this in parmenidean perspective, we might go on to say that unstable truth is not truth in the fullest sense of the word. For, of those things that sometimes are and sometimes not, at one time it is true that they are, and at another time it is true that they are not. When a thing ceases to be, the truth that it is ceases to be. Hence, this type of truth is itself subject to becoming and non-being. Insofar as what is now asserted to be true may cease to be and cease to be true, such truth is unstable, provisional. It is not, it does not have Being in the sense in which Parmenides understand to be.

In turn, science, $\textit{e}n\varphi\pi\varepsilon\alpha\tau\iota\varsigma\nu\varsigma\nu$, is only about those things whose principles cannot be otherwise, as Aristotle shows.

Consequently, Aristotelian philosophers should be slow to criticize Parmenides for his teaching both about the nature of the one Being, and following upon that, the quality of knowledge we can have about the world of Being and the world of phenomena.
The error in the criticism of Parmenides is due to a great extent, as we shall subsequently see, to a univocal conception on the part of historians of philosophy of the word knowledge --- an error that is just as inexcusable on their part as is Parmenides' error in regard to the univocity of Being. Knowledge is not an univocal term. It can refer to the knowledge of God, to the knowledge of angels, to the knowledge of men. It can mean strict demonstration, science, certitude. It can mean the knowledge of probable reasoning. It can mean the knowledge of the senses. Parmenides uses the word ἐπειτὶ τῶν ἁμαρτῶν in the rigorous sense of stable, immovable knowledge which supposes necessity on the part of what is known.

Parmenides says that non-Being is unthinkable; and whatever is thought must be. This is not the idealist position which holds that thought is prior to Being --- as though Being were but the product of thought, either in the sense of the subjective idealists or that of the objective idealists, who admit the reality of objects outside their minds. What Parmenides seems to mean is this: Thought must be about what is. This is fundamentally true, since, as we ourselves hold, even non-being is necessarily conceived "ad instar entis".

In order to understand his position on non-being and the relationship this has with knowledge, it is necessary to see what Parmenides means by the world of appearance. After that we shall be able to make a comparison between the world of Being and the world of phenomena.
Wherefore all these things are but names which mortals have given, believing them to be true — coming into being and passing away, being and not being, change of place and alteration of bright color. (18)

Mortals have made up their minds to name two forms, one of which they should not name, and that is where they go astray from the truth. They have distinguished them as opposite in form, and have assigned to them marks distinct from one another. To the one they allot the fire of heaven, gentle, very light, in every direction the same as itself, but not the same as the other. The other is just the opposite to it, dark night, a compact and heavy body. (19)

Now that all things have been named light and night, and the names which belong to the power of each have been assigned to these things and to those, everything is full at once of light and dark night, both equal, neither has aught to do with the other. (20)

And thou shalt know the substance of the sky, and all the signs in the sky, and the resplendent words of the glowing sun's pure torch, and whence they arose. And thou shalt learn likewise of the wandering deeds of the round-faced moon, and of her substance. Thou shalt know, too, the heavens that surround us, whence they arose, and how Necessity took them and bound them to keep the limits of the stars...how the earth, and the sun, and the moon, and the sky that is common to all, and the Milky Way, and the outermost Olympus, and the burning might of the stars arose. (21)

The narrower hands were filled with unmixed fire, and those next them with night, and in the midst of these rushes their portion of fire. In the midst of these is the divinity that directs the course of all things; for she is the beginniner of all painful birth and all begetting, driving the female to the embrace of the male, and the male to that of the female. (22)

In these fragments Parmenides does not deny what we would call the objectivity of the phenomenal world — he openly admits it, for he calls it the union "of Light and night". What he does deny is that this world may be called Being. And the reason is plain from the consideration we have already given to the
Being of Parmenides, namely the identification of Being with the absolute fulness of being that is God. Only that which is perfectly, absolutely, immovably Being can be called such. But "things" in the phenomenal world are not completely Being, for they only share in the Light; they merely participate in the attributes of that one Being. All in the phenomenal world is in a state of movement; there is no stability; no necessity; no absolute continuity, consequently the phenomenal world cannot be called Being. Men are deceived to this extent by the world of phenomena — that they consider the multiplicity they come into contact with through their senses to be truly Being, and consequently to have the attributes that can be applied only to that Being which is absolute. Wisdom, certitude, science is not about the world that is but a shadow, an appearance of Being, for there is no necessity and invariability about this world. Individuals and in the conditions of time and space, things are contingent, and about them we can have only doxa, opinion.

This will immediately call into mind Aristotle's dialectic of the Topics. However, this might be oversimplifying the case. We have seen that, according to Parmenides, anything less than divine truth falls short of what he means by truth, just as anything this side of divine being is not what is pure and simple. Hence, any truth, which is in the mind, admitting of any change whatsoever, or any passage from one state to another, lacks the
stability of science which Parmenides has conceived in its most absolute form. In other words, any knowledge that is not of Being falls within the range of doxa. Today it is true that it rains. Tomorrow it will no longer be true. Hence the truth of "that it rains" is unstable.

In this Parmenides seems to have at least a confused insight into the immutability of divine truth which extends to all things in the simultaneity of eternity. (23) That truth lies beyond the "beliefs of mortals".

As Aristotle pointed out, Parmenides' conception of being is univocal, and so will be his conception of truth. But it is wrong to identify being with the most perfect Being, and to identify truth with divine truth. Being can be said of what is necessary and of what is contingent; of what is actual and of what is in potency; of what is substantial and of what is accidental. It may be said of God and of creature. Non-being too is not univocal. The analogy of being and the analogy of non-being overlap. Some being of which being may be predicated, may be identical with some non-being. This may be shown from the following. What is not in act, what is merely in potency, both is and is not. Movement itself is a kind of mixture of being and non-being: it is neither determinately act nor determinately potency.

Obviously Parmenides does not reach these distinctions and identifies being with the actuality that excludes all potency, the necessity that excludes all........
forms of contingency. On the other hand, his non-being covers all that is not absolute being in the sense just described. In other words, he uses the analogy of non-being, whereas he ignores the analogy of being.

We can well understand why he refuses being to becoming. For, the act of becoming is imperfect: movement is neither determinately act nor determinately potency. Hence, in Parmenides, movement will belong to the genus non-being as opposed to the genus being identified with absolute being in its very highest form.

We can also see that the exclusion of becoming from being and its rejection into the multifarious genus of non-being does not take reality away from becoming, does not deny its objectivity. It is true, however, that just at this very point Parmenides is "in angustiis". Actually he could not have accounted for the reality of becoming without accepting the analogy of being. But we have no right to impose upon him a conclusion which he has not drawn.

That Parmenides' world of appearance and becoming is still a real world, and not, as is sometimes stated, a mere illusion, is clear from the fact that he says that there are two forms, one of which must not be named. The one that must not be named is non-being. It must not be named for every name that we apply to it supposes that it is being, whereas it is not. It is movement;
it is a participation in some way of the Being that is One. It is a mixture of "Light and night" as he says, and not full Being.

The Light in which the phenomenal world participates is called Fire. This is not unique to Parmenides — practically all of the ancients considered Fire as something that participated in the Divine. The hierarchy in the world of phenomena was ordered according to the amount of Fire and darkness each thing had within itself. This in itself is sufficient to prove the objectivity of the world of doxa, because there must be something positive if there is to be a combination. At the same time the non-being in the phenomenal world is considered as something positive, for it is had in varying degrees. Thus we have in the world of appearance the beginnings of the doctrine of the analogy of being and of non-being. In the doctrine of the phenomenal world we have those participations which should have evoked the idea of analogy. But Parmenides is so fascinated by the nothingness of this world in comparison with the absolute to be of God, that the form pertaining to the former is one that should not even be named.

Being enters the phenomenal world as Fire, but in so doing must pay a price. It can no longer retain the attributes of pure Being. It becomes void of understanding; it gives only opinion. There is a world of flux that is incapable of accurate description. What is in movement is but an appearance of the One
Being that is separated. When he says that "movement in an illusion" he does not mean that movement does not exist in the world of Nature, but only that it is an illusion of Being as defined in the above sense. Mortals are led into error when they consider that things here below are really identical with Being that is unchangeable.

Note that in explaining movement Parmenides relegates the notion of act into the background and considers only the movement. For this reason he did not want to call phenomena real Being - he went to the opposite extreme and called all these things non-being. The logical consequence of the univocity of the supreme Being is pointed out in a passage of Aristotle, in which he says that if Being is only One, as in the system of Parmenides, then we must identify Being as non-being, good and evil. The natural conclusion, he says, is a reduction to the Heraclitean doctrine of contraries, and to contradiction:

But to proceed: If their One is one as indivisible, nothing will have quantity or quality, and so the one will not be infinite, as Melissus says --- nor, indeed, limited, as Parmenides says, for though the limit is indivisible, the limited is not.

But if all things are one in the sense of having the same definition, like raiment and dress, then it turns out that they are maintaining the Heraclitean doctrine, for it will be the same thing 'to be good' and 'to be bad', and 'to be good' and 'to be not good', and so the same thing will be 'good' and 'not good', and man and horse; in fact, their view will be, not that all things are one, but that they are nothing; and that 'to be of such and such a quality' is the same as to 'be of such and such a size'. (24)

(Physics, I, 2, 185bl7)

We must point out here the great similarity between this and the Marxist doctrine of union of contradictories. They
admit openly, as we shall see when we come to the presentation of
their doctrine, that there is contradiction in everything in
nature. Movement is, indeed, nothing other than the union of absolute
contradictories, of being in place and not being in place; a union of
actuality of motion and of rest. Movement is an evident contradiction,
says Plekanov. (25)

That the problem of defining movement is an
easy thing, no one who has studied the problem will affirm. It is not
strange, therefore, that Parmenides will have difficulty in speaking of
the world of phenomena which is the world of change. In the several
quotations that follow we shall see that Aristotle himself acknowledged
the difficulty of the problem, and he did not criticize in his usual
sharp tones those who called it non-being.

That what we have said is right is evident
from what all others say about movement, and from the fact that
it is not easy to define it otherwise. For firstly one cannot
put it in any other class. This is evident from what people
say. Some call it otherness and inequality and the unreal; none
of these however is necessarily moved, and further, change is
not either to these or from these any more than from their opposites.
The reason why people put movement in these classes is that it is
thought to be something indefinite, and the principles in one of
the two columns of contraries are indefinite because they are
privative, for none of them is either a 'this' or in any of the
other categories. And the reason why movement is thought to be
indefinite is that it cannot be classed either with the potency
of things or with their actuality; for neither that which is
capable of being a certain quantity, nor that which is actually
of a certain quantity, is of necessity moved, and movement is
thought to be an actuality, but incomplete; the reason is that
the potential, whose actuality it is, is incomplete. (26)

And in the Physics III, where he himself gives
a definition of motion we find the same difficulty in defining motion because it is not something absolute:

They identify motion with "difference" or "inequality" or with "not being"; but such things are not necessarily moved, whether they are different or unequal or nonexistent. Nor is change either to or from these rather than to or from their opposites. The reason why they put motion into these genera is that it is thought to be something indefinite, and the principles in the second column are indefinite because they are privative: none of them is either 'this' or 'such' or comes under any of the other modes of predication. The reason in turn why motion is thought to be indefinite is that it cannot be classed simply as a potentiality or as an actuality—a thing that is merely capable of having a certain size is not undergoing change, nor yet a thing that is actually of a certain size, and motion is thought to be a sort of actuality, but incomplete, the reason for this view being that the potential whose actuality it is is incomplete. That is why it is hard to grasp what motion is. It is necessary to class it with privation or with potentiality or with sheer actuality, yet none of these seems possible. There remains then the suggested mode of definition, namely, that it is a sort of actuality, or actuality of the kind described, hard to grasp, but not incapable of existing. (27)

We can get a better understanding both of the world of Being and of the world of doxa by comparing the one to the other. The theory of limits gives us a method of comparing these two that permits us to see much more in Parmenides than appears in the literal understanding of the fragments that remain of his teaching.

Parmenides describes the world of Being as a perfect sphere, absolutely continuous throughout, and bound in at the periphery so that it is completely immobile.

Since then it has a furthest limit, it is complete on every side, like the mass of a rounded sphere, equally poised from the centre
in every direction; for it cannot be greater or smaller in one place than in another. For there is nothing that could keep it from reaching out equally, nor can aught that is be more here and less there than what is, since it is all inviolable. For the point from which it is equal in every direction tends equally to the limits. (28)

From this text it seems obvious enough that the sphere is chosen to suggest the perfection of Being, but why did he choose this figure instead of any other? It is because the sphere is the perfect geometrical figure. It has no diversity within itself; at every point its surface is equally distant from the center, thus accounting for homogeneity in respect of measurement; in comparison with the polygon or cube, whose side are capable of infinite diversity, the sphere is without diversity. It is this last idea we shall try to develop. For the sake of simplicity, we shall speak of a circle and a polygon in making the comparison --- these have the same relationship to each other as the sphere and cube, except that they are in only two dimensions.

The first thing to point out in comparing the circle and the polygon is that the circle is as pure Form, that is, invariable, while the polygon, in addition to having Form, has also matter by which it is variable. The circle is formed by one single line, whose beginning and whose terminus are identical --- there is no variation in the shape of the circle. But the polygon has form (a figure bounded by straight lines), but it has also matter: the number of sides of the polygon can vary ad infinitum, and so approach ad
infinitum the figure of the circle. Now the world of Being of Parmenides is like the circle, which is Form alone, without variation. Form, we know, is the principle both of Actuality and Knowability in a thing. Form gives perfection: a thing is perfect in so far as it has form. Form gives necessity. Consequently, when we say that the Being of Parmenides is Form (represented by the sphere --- or as we are now doing by the circle) we are attributing to Being those characteristics that make it Divine.

Matter, on the other hand, is the principle of variability. This is represented by the polygon, whose sides, those infinitely variable, can never reach the perfect Form of the circle. Thus the polygon represents the world of doxa. The phenomenal world is constantly changing; it is continually moving towards the world of Being, yet remains always in the state of becoming. An infinite distance separates these two worlds, for as long as there is any distance at all between the world of phenomena and the world of Being, the distance is infinite. The sides of the polygon can be increased, and in this way, it will look more and more like a circle, but it can never reach the Limit, so that at some point we could say, "The polygon is identical with the circle." We shall never be able to say, likewise, that "The world of phenomena is Being".

The comparison of the world of phenomena with
As we pointed out, there is a hierarchy in
the phenomenal world, according to which things possess more or less Fire that come from Being, and more or less Darkness. All these things are constantly changing; are never fully in the possession of the perfect form of Being. Only that of which we can say absolute _it is_, is Being.

The world of doxa cannot trespass upon the world of Being, nor can the world of Being be separated from itself for "It is immovable in the bonds of mighty chains, without beginning and without end; since coming into being and passing away have been driven afar, and true belief has cast them away. It is the same, and it rests in the self-same place, abiding in itself. And thus it remaineth constant in its place; for hard necessity keeps it in the bonds of the limit that holds it fast on every side." (29)

The same comparison between the two world can be made by means of the infinite approach from the number one to number
two. One is as the phenomenal world that is ever varying, ever in the state of becoming. Two is as the world of Being that is apart, not varying, enclosed within itself. The diversity in the world of doxa is as the varying values of the one in their movement towards two, which is the form that does not vary. As long as one does not become two, it cannot be called two, just as the world of becoming cannot be named Being — that is, forever.

In numbers, the phenomenal world and the world of Being are represented in this way:

\[
\frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{16} \rightarrow 2
\]

Variation, becoming, non-Being \(\rightarrow\) Being, Stability

There is another aspect of the Being of Parmenides that can be brought out through the method of Limits. It is the aspect of continuity and homogeneity. He says that Being is the same throughout; all at once; indivisible. This attempt on the part of Parmenides to reach Science or Wisdom by reducing all to homogeneity finds its counterpart in modern logical mathematics. And the advent of this modern explanation helps us to understand better the conception of Parmenides.

We must not consider the world of Being as a
round, solid sphere, made up of earth and the other elements. Some historians make of Parmenides a corporeal monist. The sphere of which he speaks is rather a sphere of thought, an intellectual sphere that has an intellectual boundary. (30) This sphere is Form, in contrast with matter which is variable. It is the sphere that mathematicians use --- and mathematics abstract from all causes except formal.

In order to give an absolutely complete explanation, rationalization of nature, it is necessary to reduce the formal differences in the world to homogeneity. This, of course, is impossible in itself and impossible from the viewpoint of the scientist himself. For if all formal difference were reduced to homogeneity, then all knowability would be removed from the universe, since only form gives knowability --- it would be the reduction of all form to matter. (We shall see this point more fully when we study Democritus).

In his preface to Emile Meyerson's *Essais*, Louis de Broglie points out the logical character of the attempt to reduce all to homogeneity:

L'identique parfait est essentiellement inimaginable, mais aussi ne l'imaginons nous jamais réellement tel. Toujours notre conception implique une sorte de réserve mentale : les choses seront identiques, mais néanmoins discernables. C'est ainsi que, quand nous parlons d'identifier, de rendre identique un divers, ce que nous voulons dire en réalité, c'est que nous entendons le rendre moins divers, plus identique qu'il n'était. L'identique lui-même apparaît comme situé, à la lettre dans un lointain infini, mais ce n'est qu'en marchant vers cet idéal place hors de son atteinte que la raison accomplit sa tâche. L'identique ainsi compris n'est par conséquent, qu'une notion-limite,
et ce terme nous rappelle aussitôt que c'est ainsi également que le mathématicien qualifie cet infiniment petit qui forme la base des mathématiques modernes tout entières. (31)

The tendency of Parmenides, like the attempt of logical-mathematicians, is to fill all gaps, to make an absolute continuum. Meyerson points out that if this were really accomplished, Science would really destroy itself, for it would reduce everything to sterile identity. And that, precisely, is what Parmenides does with his notion of Being. He wants to reduce all Science to the common metaphysical principles, which is Science in its most potential condition. It is the utter destruction of the science of Nature which must study things in their multiplicity. Others of the ancients spoke of natural principles (fire, water, earth and air) and thus, they remained philosophers of nature, but Parmenides tried to reduce all Science to the one principle, "metaphysical Being." In this, homogeneity overcomes all formal diversity.

The construction of his intellectual sphere is again shown in the method of limits, as was the distinction between the world of doxa and that of Being. The sphere is entirely without gaps; continuous throughout; completely homogenous: at the Limit of the phenomenal world.

It is represented by the infinite series starting out from one to go towards two. Between each successive dichotomy the continuum must be filled in. This is done by means of new divisions
ad infinitum, by both rational and irrational numbers. At the limit of this continuum, that is, when the distance from, for example, 1 to $\frac{1}{2}$ is theoretically filled in, then the filling in of the continuum starts in two dimensions, and thus surface is constructed. When surface reaches the Limit, then a movement in the third dimension starts and tends towards the Limit of this dimension. And in this way the intellectual or logical sphere is completed. This sphere is the Ideal Limit of all movement. In the terminology of Parmenides it is the Limit of the world of phenomena, at which point all movement ceases; when all is completely a continuum; when Being is perfect and contained within itself.

Thus, the metaphysical Being is the extreme Limit of the world of change. This is the Being about which we can have certitude. We, too, would admit this. But we should qualify the nature of this science. It is perfect and certain, we must say, because it is so potential — because it is so much in conformity with the potential nature of our intellect, and not because of the supreme degree of intelligibility in itself.

**Conclusion:**

We have tried to bring out the double aspect of the teaching of Parmenides. We have tried to show that he is not an absolute monist in the sense in which this word is ordinarily understood.
He admits a world of change as well as a world of Being that is unchangeable. What he does is to deny the attribution of Being to the phenomenal world, because he considers Being in an univocal way reserving it for that which "is" in the fullest sense. Consequent upon this, he denies true science about the world of change, because only that which is necessary and eternal is true. We have tried to give a rational explanation of this position according to Aristotelian principles.

The Marxist philosophers who see in Parmenides the antithesis of their doctrine of eternal dynamism of matter would do well to study this aspect of Parmenides which is constantly overlooked, namely, the world of becoming.
Zeno:

Zeno, the most important of the disciples of Parmenides, offered a series of arguments in defense of the One of his master. These arguments have had a profound influence on the history of philosophy, not so much because of their intrinsic worth, but because of the method employed and because of the discussion they provoked.

Aristotle says that Zeno is the founder of the dialectical method. (32) Zeno's method was to assume for the moment the opinion of his adversaries and then to show the contradiction that this position would lead to. As Aristotle says in defining dialectics: "Dialectical arguments are those that reason from premisses generally accepted to the contradictory of a given thesis." (33) Now, Zeno assumed the opinion "of mortals", namely that Being is constantly undergoing change, and showed the contradiction that this opinion would lead to. In so far as Zeno's arguments have to do with the method of limits, namely the progression of knowledge towards a certitude that can never be absolute, this is not the dialectics of the Topics of Aristotle. It is rather in the sense mentioned above, in the sense of argumentum ad hominem that Zeno's arguments are dialectical.

In form these arguments are very much like the dialectic of the Sphists, who pretended to show that out of every proposition a contradictory conclusion could be drawn. To call Zeno a
Sophist goes beyond the evidence we have. Indeed, Zeno bases the validity of his arguments upon the principle which the Sophists explicitly reject, namely, the principle of contradiction. Zeno tries to show how the negation of Parmenidean unity leads to contradiction. We cannot, however, deny the influence of Zeno upon the Sophists. It was to Zeno that the fifth and fourth century dialectic of sophistry owed its spirit and its method. Plato links up the Sophists with Parmenides and Zeno, when he says that the eristic arguments have their foundations in the antinomies of these philosophers. In the beginning of the Sophist Plato speaks of his adversaries as εἰ διὰ τῆς αἰσχρού τής αἰσχρού καὶ τοῦ ἀργοῦ καὶ τῆς ἁμαρτίας. (34). The arguments of the Sophist Gorgias are strongly reminiscent of Zeno. It seems fairly certain that Gorgias drew his method and his arguments largely from the disciple of Parmenides. It is important, however, to note the completely negative result to which Gorgias is led by Zeno’s critical methods. For the fifth century was one of growing scepticism, a century in which existing standards were questioned and existing institutions criticized. (35)

The importance of Zeno for the Marxists comes not only because of the dialectical method which he introduced, but because of the problem that Zeno raised. Marxists take Zeno’s argument at face value and admit openly that movement is a contradiction.

La base de tous les phénomènes de la nature est constituée par le mouvement de la matière. Mais qu’est-ce que le mouvement ? Il est une contradiction évidente. Si l’on vous demande si un corps
en mouvement se trouve au moment donné à tel endroit, vous ne pourrez, malgré votre bonne volonté, répondre selon la règle d'Uberweg, c'est-à-dire selon la formule : "Oui est oui, et non est non". Un corps en mouvement se trouve à un endroit donné, et en même temps il ne s'y trouve pas. On ne peut pas juger de lui autrement que d'après la formule : "Oui est non et non est oui". Ce corps se présente donc comme une preuve irréfutable en faveur de la "logique de la contradiction", et quiconque ne veut pas prendre son parti de cette logique doit proclamer avec Zénon que le mouvement n'est rien d'autre qu'une illusion des sens. (36)

We shall now study the arguments of Zeno. (37)

Throughout this whole discussion it is important to remember that Zeno is arguing in defense of the One of Parmenides. There cannot be any division of the One; there cannot be any movement involving the One. That is the purpose of the arguments, to show that any change, division, movement on the part of the supreme Being would involve a contradiction.

Zeno's first argument is against the division of the One. It runs in this way : Whatever there is in Being must be one, for if it were divisible at all, then it would necessarily be divisible at every point. Let us assume for the moment that the One is divisible and that the division actually took place. The division must continue on to infinity --- if Being by nature is divisible, a simple division into two parts does not change its nature, and consequently, once we admit any possibility of division we must carry this possibility out to its extreme limit. But if division goes on to infinity, we would reach a condition in which Being would have no dimension. But whatever has no dimension is the same as nothing.
This argument rests on the assumption that for plurality there must be a certain number of indivisible units out of which the One, the Continuum is constituted. But Being, which is homogeneous, if divisible at all must continue to be divided as long as any magnitude is left. The conclusion of such a division is the entire destruction of the Continuum, the negation of the One, since this division would terminate with parts that had no measurement. But parts that have no measurement are not real. The continuum would be reduced to an infinity of points.

Further, if unity itself is indivisible, according to Zeno's postulate it will be nothing. For that which neither when added makes a thing greater nor when substracted makes it less, he asserts to have no being, evidently assuming that whatever has being is a special magnitude. And if it is a magnitude, it is corporeal. (38)

Thus, according to Zeno, if the continuum is at all divisible it is impossible that there be a certain number of indivisible units, and consequently, there cannot be plurality in Being. The continuum must be either One or a plurality — it is not a plurality.

The error of this argument lies in the supposition that a magnitude which is infinitely divisible according to definition can be actually infinitely divided. Only a process with a finite number of steps can be completed and yield a completed result.
The solution lies in keeping distinct the real order of nature and the mathematical order, for the difficulty comes from the confusion of the two.

There can be infinite divisibility only in the mathematical order, which is concerned only with formal causality --- or the formal definition. Mathematics abstracts from actual existence. Therefore, when we speak of infinite divisibility of a continuum through points we are merely concerned with the mathematical definition of the continuum and the point.

By continuous I mean that which is divisible into divisibles that are infinitely divisible. Moreover, it is plain that everything continuous is divisible into divisibles that are infinitely divisible: for it it were divisible into indivisibles, we should have an indivisible in contact with an indivisible, since the extremities of things that are continuous with one another are one and are in contact. The same reasoning applies equally to magnitude, to time, and to motion. (39)

And the point is that which being added to does not increase and being subtracted from does not decrease, for the point itself has no extension. The point is indivisible for it has no magnitude. And having no magnitude it cannot compose a line.

Nothing that is continuous can be composed of indivisibles, e.g., a line cannot be composed of points, the line being continuous and the point indivisible....Nor again can a point be in succession to a point or a moment to a moment in such a way that length can be composed of points or time of moments, for things are in succession if there is nothing of their own kind of intermediate between them, whereas that which is intermediate between points is always a line, and that which is intermediate between moments is always a period of time. (40)
Zeno's argument was directed against those who supposed that the geometrical point can be the element out of which Being is constructed, namely, the Pythagoreans. The supposition of the Pythagoreans is that the geometrical point is the basic element of all reality. Tannery, in his Science Hellenic and elsewhere (41) says that Zeno was attacking the Pythagoreans. The resurgence of this confusion of mathematics and the philosophy of nature in modern times can be traced in great part to Descartes.

Since by definition a continuum (or any magnitude) is divisible into divisible parts, and at the same time, the point is defined as that which is indivisible and without any magnitude (but is either the principle or the terminus of magnitude), it is evident that there can be an infinity of points in any line —— points added to points never constitute magnitude. But an actual division of a given magnitude in nature cannot take place infinitely, because the ideal point, that which is absolutely without magnitude can exist only in the mind. Mathematics abstracts from real existence and argues only from the formal definition.

The second argument of Zeno is again the possibility of motion, an argument closely allied to that against plurality. According to the Parmenidian position all plurality as well as all motion in the continuum is illusory. An admission of real motion, according to Zeno, involves a contradiction. There are four variations of the
argument against motion. They are called: the Dichotomy, the Achilles, the Arrow, and the Stadium.

The first of these, the Dichotomy, which takes its name from the possibility of cutting in two any distance, has two forms. The first of these says that if motion through a finite distance is to take place, it must take place in finite time. But this is impossible because of the infinite divisibility of any distance. In this form the notion of time is essential to the argument. The second form of the argument is based upon the impossibility of counting the infinite number of successive dichotomies that are passed over by the moving body.

The first form of the argument:

Since the continuum is infinitely divisible, there must be in any given distance an infinite number of half-way points. And a body traversing this given distance must reach one one of these half-way points in turn. Though each succeeding step is divided in two, nevertheless an infinite distance remains to be covered. And each succeeding point must be reached in a finite period of time. Since there is an infinite number of intervals, there must be an infinite number of periods of time. But all these intervals added together add up to infinite time. Hence it is impossible to traverse any given distance infinite time. Hence, movement is impossible.

The second form of the argument the idea of
counting is essential, while the time element does not enter in. In
the Physics VIII, Aristotle states the argument.

The same method should be adopted in replying to those who put
Zeno's puzzle, and claim that in traversing any distance we
must first traverse half of it, that these subdivisions are
infinite, and that it is impossible to complete an infinite
number of distances: or as some, who put the puzzle in a
different form, claim, that in the course of its motion the
moving body must, as it reaches each half-way point, count
the half of this half, so that when it has moved through the
whole distance it has counted and infinite number which is
admittedly impossible. (42)

The argument is based on the impossibility
of an actual infinite number. An observer watching the progress of
a moving object should be able to count the half-way points that are
passed. But ex hypothesi the remaining distance always remains
capable of bisection. Consequently there would be an actual infinity
of points. Since this is impossible, so is the motion itself.

Aristotle gives us the key to the solution of
this argument which is practically the same as Zeno's first argument
against plurality --- for it is based upon the same confusion. First
of all Aristotle points out that we must distinguish the two kinds of
infinity, the infinity of divisibility and the infinity of extension.
These might be called the infinity of smallness and the infinity of
greatness.

Aristotle admits that in the hypothesis of an
infinitely great distance an infinitely great time would be required to
cover the distance. On the other hand the divisibility of any
distance is likewise paralleled by the divisibility of time (for it,
too, has magnitude) into infinitely small parts.

And at the same time it is clear that all magnitude is also
continuous; for the divisions of which time and magnitude
respectively are susceptible are the same and equal. More­
over, the current popular arguments make it plain that, if time
is continuous, magnitude is continuous also, inasmuch as a thing
passes over half a given magnitude in half the time taken to
cover the whole; in fact without qualification it passes over
a less magnitude in less time; for the divisions of time and of
magnitude will be the same. And if either is infinite, so is
the other, i.e., if time is infinite in respect of its extrem­
ities, length is also infinite in respect of its extremities;
if time is infinite in respect of divisibility, length is also
infinite in respect of divisibility; and if time is infinite
in both respects, magnitude is also infinite in both respects.

Hence, Zeno's argument makes a false assumption in asserting
that it is impossible for a thing to pass over or severally
to come in contact with infinite things infinite time. For
there are two senses in which length and time and generally
anything continuous are called "infinite": they are called so
either in respect of divisibility or in respect of their ex­
tremities. So while a thing in a finite time cannot come in
contact with things quantitatively infinite, it can come in
contact with things in respect of divisibility; for in this
sense the time itself is also infinite; and so we find that
the time occupied by the passage over the infinite is not a
finite but an infinite time, and the contact with the infin­
ities is made by means of moments not finite but infinite in
number.

The passage over the infinite, then, cannot occupy a finite
time, and the passage over the finite cannot occupy an infinite
time; if the time is infinite the magnitude must be infinite
also, and if the magnitude is infinite, so also is the time. (43)

In both forms the argument is essentially
the same. It is based on the confusion of the two kinds of infinity.
At the same time it has at its foundation the same error that was
made in the argument against plurality, for it supposes that infinite divisibility means the same as actual infinite division. The same confusion of the real and the mathematical order is found here. It is not surprising, consequently, when we find modern mathematicians and scientists who are often guilty of the same confusion place so much emphasis on the arguments of Zeno.

The argument of the Dichotomy can be understood in another way. Before the body in motion can reach a certain point it must pass the half-way mark. Before it can reach the half-way mark it must reach a half-way mark previous to this one. And since the line is infinitely divisible, the body which would move from one point to another would have to pass an infinite number of half-way marks, and consequently it could never even start. Thus motion would be impossible.

In this form of the argument the time element does not enter in, nor does the notion of actual infinite number, since there is no motion at all. We might argue against Zeno, if we assume that the form of the argument which denies the possibility of passing through a finite distance in a finite time, as well as that other which denies the possibility of an actual infinite number are correct interpretations of his argument, that he already admits the possibility of motion. But this is not really against the position of Zeno, for it is is method of arguing (the dialectical method) to assume the position
of his adversaries and to show the contradictions that this position involves.

The other three arguments against motion (the Achilles, the Arrow, and the Stadium) are practically the same as that of the Dichotomy: all have as their foundation an error on the nature of magnitude and its divisions. They assume that all magnitude is composed of indivisibles: either that the continuum is made up of points, or that time is composed of a series of moments (nunc), or that motion is made up of a series of actualities.

This same confusion is found in the Marxist doctrine of identity of contradictories. That they borrow heavily from Zeno will be evident in their examples of contradiction --- given later in the dissertation --- but what is of most importance is that they accept at face value the arguments that Zeno proposes as argumenta ad hominem.
Heraclitus:

If we may say that the Marxists have a favorite philosopher among the ancient Greeks, that philosopher is Heraclitus. It was particularly with him in mind that Engels said that dialectical materialism is a return to the ancient philosophy.

What generally is brought forth as characteristic of Marxist philosophy — we shall see this in detail in the presentation of their doctrine — is firstly, the dynamism of matter; and secondly, the union of contradistinctions in all things in nature. These two elements cannot, indeed, be separated, for it is the element of contradiction that explains the dynamism. In the following fragments from Heraclitus the similarity between the Marxist doctrine and the teaching of the "philosopher of mobilism" is striking, and Engel's reference to Heraclitus might seem entirely justified.

We shall give only those references that touch directly upon the element of contradiction or that of dynamism.

24: Fire is want and satiety.

32: The sun is new every day.

33: God is day and night, winter and summer, war and peace, surfeit and hunger; but he takes various shapes, just as fire, when it is mingled with spices, is named according to the savour of each.

39: Cold things become warm, and what is warm cools; what is wet dries, and the parched is moistened.

40: It scatters and it gathers; it advances and it retires.
41, 42 : You cannot step twice into the same rivers; for fresh waters are ever flowing in upon you.

43 : Homer was wrong in saying: "Would that strife might perish from among gods and men!" He did not see that he was praying for the destruction of the universe; for, if his prayer were heard, all things would pass away.

44 : War is the father of all and the king of all; and some he has made gods and some men, some bond and some free.

46 : It is the opposite which is good for us.

50 : The straight and the crooked path of the fuller's comb is one and the same.

51 : The sea is the purest and the impurest water. Fish can drink it and it is good for them; to men it is undrinkable and destructive.

57 : Good and evil are one.

59 : Couples are things whole and not whole, what is drawn together and what is drawn asunder, the harmonious and the discordant. The one is made up of all things, and all things issue from the one.

60 : Men would not have known the name of justice if these things were not (injustices).

62 : We must know that war is common to all and strife is justice, and that all things come into being and pass away through strife.

67 : Mortals are immortals and immortals are mortals, the one living the other's death and dying the other's life.

69 : The Way Up and the Way Down is one and the same.

70 : In the circumference of a circle the beginning and the end are common.

78 : And it is the same thing in us that is alive and dead, awake and asleep, young and old; the former are shifted and become the latter, and the latter in turn are shifted and become the former.

81 : We step and we do not step into the same rivers; we are and we are not.

104 : It is not good for men to get all they wish to get. It is sickness that makes health pleasant; evil, good; hunger plenty; weariness, rest. (44)
This is the world in which we mortals live: a world that is constructed of conflicting elements, a world that changes before we can have two successive thoughts about it. It is a world without stability. At the same time, the conflict and the consequent mobility are necessary for its very existence. Homer was wrong in saying 'Would that strife might perish from among the gods and men.'

In the Marxist doctrine, which is based upon the Hegelian notion of dialectical movement, conflict is exalted as the cause of all progress. At the root of this strife is negation or privation — the intrinsic principle of fecundity that is present throughout Nature, since matter is itself self-contradictory. To do away with strife would be the same as to do away with our universe, since all diversity, all perfection, according to the Marxists comes about through conflict.

What is generally considered to be the essential part of Heraclitean teaching, that which makes it the antinomy of Parmenidean doctrine, is the notion of conflict and becoming. If this were the only element in Heraclitus, then the Marxists, indeed, could certainly rightfully claim a continuity with his philosophy. But there is another element, Heraclitus's teaching on the One which is more important, more essential than the doctrine of becoming. For, as we shall see, Heraclitus calls the knowledge of the One Wisdom, while our knowledge of the changing world is subject to error. Consequently, the continuity
between the philosophy of Heraclitus and that of the Marxists is not verified, except in an accidental manner.

The fragments that follow are those concerning the nature of the One or to the knowledge of the One.

Diogenes Laertius : IX, 7-11 :
All things are composed of Fire and dissolve into Fire; all things come to be in accordance with Destiny and all that exists is bound together by that which runs in opposite directions; and all things are full of Psychai and daimons... You cannot discover the limits of Psyche, though you journey over every way: so deep is its cause (logos). (45) Hack, p. 70.

Sextus Empiricus, VII, 127 :
That which contains us in endowed with reason (logos) and with intelligence. According to Heraclitus, this divine Reason we draw in when we breathe, and become endowed with mind; and when we are asleep we are forgetful, but on waking are again rational. For during sleep, since the passages of the senses are closed, the mind in us is separated from its union with that which contains us...Heraclitus asserts that this common and divine Reason, by parktaking in which we become endowed with Reason, is the criterion of truth. (46) Hack, p. 74.

Fragments enumerated by Bywater, and given in Burnet's Early Greek Philosophy :

1 : It is wise to hearken not to me but to my word, and to confess that all things are one.
(Another translation of this fragment : It is wise to hear not me but the Ordinance, and to agree that the One knows all things).

2 : Though this Word (logos) is true evermore, yet men are as unable to understand it when they hear it for the first time as before they have heard it at all. For, though all things come to pass in accordance with this Word, men seem as if they had no experience of them, then they make trial of words and deeds such as I set forth, dividing each thing according to its kind and showing how it truly is.
16: The learning of many things teach the not understanding, else it would have taught Hesiod and Pythagoras, and again Xenophanes and Hekataios.

17: Pythagoras, son of Mnesarchos, practiced scientific inquiry beyond all other men, and making selection of these writings, claimed for his own wisdom, what was but a knowledge of many things.

18: Of all whose discourses I have heard, there is not one who attains to understanding that wisdom is apart from all.

19: Wisdom is one thing. It is to know the thought by which all things are steered through all things.

20: This world (\( \text{Kosmos} \)) which is the same for all, no one of gods or men has made; but it was ever, is now, and ever shall be an ever-living Fire, with measures of it kindling and measures going out.

26: Fire in its advance will judge and convict all things.

28: It is the thunderbolt that steers the course of all things.

49: Men that love wisdom must be acquainted with many things indeed.

61: To God all things are fair and good and right, but men hold some things wrong and some right.

65: The wise is only one.

70: In the circumference of a circle the beginning and end are common.

71: You will not find the boundaries of soul by travelling in any direction, so deep is the measure of it.

91a) Thought is common to all.

91b) Those who speak with understanding must hold fast to what is common to all as a city holds fast to its law, and even more strongly. For all human laws are fed by the one Divine Law. For the Divine Law extends its power as far as it pleases.

96: The way of man has no wisdom, but that of God has.

98-99: The wisest man is an ape compared to God, just as the most beautiful ape is ugly compared to man. (47)
We have in these passages two things to point out: the multitude of the different titles he bestows upon the supreme God; and the knowledge of this One, which is Wisdom.

Heraclitus calls the supreme God Fire, the One, Psyche (Life or Soul), That which contains (Τὸ ΝΕΡΩΧΟΝ), the common Reason (λογίμος), the one Law (Νομος), Destiny, Lightning, the Way Up and the Way Down. Each of these titles corresponds to the various aspects of the Divinity that makes all things One.

If we understand Heraclitus' purpose, we shall have a key to what seems to be a contradiction: a supreme God who is one yet is many. Heraclitus doctrine is a reaction to that of Xenophanes and Pythagoras, who had separated God from the universe of men and animals and plants and inanimate things, that is the world of ΠΛΗΝ ΠΟ. Against the separation of the supreme God from the changing many, Heraclitus reaffirmed the identity of the supreme God with all that is. Against Pythagoras he argued that the One Fire was itself all the changing opposites and was not merely present, in some mysterious fashion, in all things.

How could Fire change and yet retain the perfection of the Divinity? Heraclitus tried to solve this difficulty by his doctrine of recurring Fire. As Hack says, "this might be called the doctrine of Identity by repetition." (48) Heraclitus says: "The universe is begotten from Fire and again turns into Fire in alternating
cycles through all eternity; and this takes place in accordance with Destiny". (49) Anaximander had already taught that infinite universes are born and perish again in infinite succession; and Anaximenes followed this direction of his master, Heraclitus, seeing in this a solution for the difficulty of the One and the many.

Heraclitus fixed the intervals at which the all consuming Fire recaptured its perfect unity by overcoming all change and diversity. This interval was fixed at 10,800 years and it was called the Great Year. Heraclitus considered thirty years to be one generation, and this multiplied by the number of days in a solar year (360 for him) is equal to the above figure. During this Great Year the recurring Fire blots out all changes and shows that they were essentially an illusion. Thus through repetition is attained an identity that preserves the perfection of the supreme God. The same operation is performed for time: the endless torrent of time is arrested and disappears into the sands of eternity.

There is a passage in Engel's *Dialectics of Nature* remarkably similar to this.

Matter moves in an eternal cycle completing its trajectory in which a period so as that in comparison with our earthly year is as nothing; in a cycle in which the period of highest development, namely the period of organic life with its crowning achievement self-consciousness, is a space just as comparatively minute in the history of life and of self-consciousness; in a cycle in which every particular form of the existence of matter --- be it the sun or a nebula, a particular animal or
animal species, a chemical combination or decomposition — is equally in transition; in a cycle in which nothing is eternal, except eternally changing, eternally moving matter and the laws of its movement and change. But however often and pitilessly this cycle may be accomplished in time and space, however many countless suns and earths may arise and fall, however long it may be necessary to wait until in some solar system, on some planet appear conditions suitable for organic life, however many countless beings may fall and rise before, out of their midt, develop animals with a thinking brain that find an environment that permits them to live, be it even only for a short period, we are, nevertheless, assured that matter in all its changes remains eternally one and the same, that not one of its attributes may perish, and that some iron necessity which compels the destruction of the highest earthly bloom of matter — the thinking spirit — also necessitates its rebirth at some other place, at some other time. (50) Dialectics of Nature, p. 125.

One essential difference between these two doctrines, however (and we must point it out immediately) is that in the system of Heraclitus Mind is prior to the movement of the Fire, for it is Reason directing all that comes about. In the Marxist doctrine, on the other hand, Mind comes to be as the result of the blind and necessary movement of matter. The presence of Finality in the one, and the absence of it in the other, make all the difference in the world. What is important in the doctrine of Heraclitus is not that Fire is something material, comparable to matter, which Marxists say is the reality of which all things are made. Fire must not be looked upon so much from the viewpoint of material causality (to express this notion in Aristotelian terminology — though this is not excluded), but rather from the aspect of final causality, for Fire is the Ratio, the Logos that is present in all things. Fire is the Intellect that directs all.

When we consider that matter in the Marxist philosophy is a blind force,
without direction, without intelligence, we see that there cannot be any essential continuity between this and the philosophy that teaches the necessity of a Mind directing the whole of Nature.

In God in Greek Philosophy Hack points out the paradoxical content of Heraclitus doctrine. Instead of being the philosopher of change, he is essentially a monist, for the \( \gamma\nu \tau\varsigma\pi\varepsilon \) is but a means for bringing out the attributes of the supreme God who is one.

And yet it has been the fate of Heraclitus, who invented this almost magical artifice for the abolition of real time and real change, to be abused and admired as the philosopher of the "flux". Heraclitus invented the doctrine of the flux, that \( \gamma\nu \tau\varsigma\pi\varepsilon \), for a different but wholly consistent purpose, as we have already seen; it was intended to reunite the supreme god with the changing world, from which Xenophanes had separated his One God.

The doctrine of Recurrent Fire also contributed to solve the problem of causality and impure body. If at regular intervals nothing remained except pure Fire, the most subtle and causal of all substances, it seemed to Heraclitus that he had released the supreme god from the impurity and the passivity of body. Therefore Heraclitus did not hesitate to emphasize the comparative baseness of earth and water. He referred to the Path on which they were formed as the Path Down, and as Deficiency or Want....

The philosophy of Xenophanes had induced Heraclitus to go far on the road that ultimately led to the complete distinction between the Aristotelian God (immaterial Reality) and matter ("material" unreality). The supreme god of Heraclitus was still spoken of as changing, but Fire had assumed the dignity of the cause and the agent of change, and its activity was necessarily contrasted with the passivity of that which it caused. But that which is caused by Fire is the lower forms of Fire; and these lower forms take on a degree of relative passivity and unreality which corresponds to their lowly stations in the temporal universe. They become mere intervals in the one active divine reality of Fire. God is the eternal cause, and all change is temporal (51)
Heraclitus was very critical of those who thought that in the knowledge of the many they had wisdom. Wisdom is rather the knowledge of the One. "The learning of many things teaches not wisdom". And "Wisdom is one thing. It is to know the thought by which all things are steered through all things". Thus we have in Heraclitus a great similarity with the doctrine of Parmenides. Each has a world of change which cannot give the certain knowledge that is an attribute of Wisdom; each has the One which does not change in itself but is eternal and necessary. Wisdom consists in seeing all in this one. In comparing Heraclitus and Parmenides, therefore, we should take both these aspects into consideration. The comparison will then be made in the following way:

\[
\begin{array}{c}
\text{One} \\ \text{Parmenides: Being} \\ \text{Phenomena} \\ \text{\( \delta \xi \)} \\
\end{array} \rightarrow \begin{array}{c}
\text{One} \\ \text{Fire} \\ \text{Heraclitus} \\ \text{\( \pi \xi \)} \\
\end{array} \\
\text{Sense knowledge}
\]

And not in this way:

\[
\begin{array}{c}
\text{One} \\
\text{Parmenides: Being} \\
\end{array} \rightarrow \begin{array}{c}
\text{Heraclitus} \\
\text{\( \pi \xi \)} \\
\end{array}
\]

The method of limits gives us an excellent means to understand Heraclitus just as it helped us to understand Parmen-
ides. The doctrine of the recurring Fire is, as Hack put it, "the doctrine of identity through repetition." We can consider the Fire as the 1 that is in eternal movement towards 2. This 2 is the ideal limit --- it is that point at which real diversity would be had, if the movement from 1 ever reached there. The One, the Fire tends towards otherness in a movement that is eternal, but at definite cycles there is a return to Itself, and it sees that it has not really gotten away from itself; it has not really become anything different; it realizes that its attempt to make 2 which is otherness, is but an ideal, a logical attempt. There can never be anything but Fire.

The most fundamental tendency of modern logical mathematics is the attempt to create multiplicity out of identity. The intellect by using its native power of construction — by repeating an act properly its own — it tends to bridge the difference between two things that are formally different. If per impossibile the limit could be reached, the gap would be perfectly breached and there would be perfect identity of two formally distinct concepts.

The power that the intellect uses is its ability to construct relations of identity. For example, in the predication A is A the intellect recognizes the identity of subject and predicate. But the intellect can continue its judgements. It can know each following act as well as the first. Intelligit se intelligere, etc. Nothing new is added from the outside, but all diversity comes
from the intellect itself. The diversity consists in the new reflection of the intellect according to a certain order, in which order the mind sees its former judgments and knows that in spite of the different acts there is a fundamental unity.

It is not sufficient to have mere repetition. There must be order. And the mind must see this order and know that it is constructing a continuum. In the infinite series that proceeds from 1 to 2 the mind sees that in each successive division by two it is constructing an order, yet it realizes that it is still within the limits of 1, and will eternally remain there. But because of the diversity of each succeeding division the intellect has the impression of constructing the entire distance from 1 to 2.

The possibility of the infinite movement comes about because the intellect does not depend on any new experience, but has all that it needs within itself to create this diversity. All that it needs to start off is the one simple concept. The intellect takes over from there and with its native power constructs all the diversity that comes into the successive judgements. It need not rely again on experience because the relationships that are set up are not real or predicamental but are relations of reason only.

Ex hoc autem ulterius concludit, quod identitas est unitas vel unio; aut ex eo quod illa quae dicuntur idem, sunt plura secundum esse, et tamen dicuntur idem in quantum in aliquo uno conveniunt. Aut quia sunt unum secundum esse, sed intellectus utitur eo ut pluribus ad hoc quod relationem intelligat. Nam non potest in-
telligi relatio nisi inter duo extrema. Sicut cum dicitur aliquid esse idem sibi ipsi. Tunc enim intellectus utitur eo quod est unum secundum rem, ut duobus. Alias eisuedem ad seipsum relationem designare non posset. Unde patet, quod si relatio semper requirit duo extrema, et in huiusmodi relationibus non sunt duo extrema, secundum rem, sed secundum intellectum solum, relatio identitatis non erit relatio realis, sed rationis tantum, secundum quod aliquid dicitur idem simpliciter. Secus autem est, quando aliqua duo dicitur esse idem vel genere vel specie. Si enim identitatis relatio esse res aliqua praeter illud quod dicitur idem, res etiam, quae relatio est, cum sit idem sibi, pari ratione haberet aliam relationem, quae sibi esset idem, et sic in infinitum. Non est autem possibile in rebus in infinitum procedere. Sed in his quae sunt secundum intellectum nihil prohibet. Nam cum intellectus reflectatur super suum actum, intelligunt se intelligere. Et hoc ipsum potest etiam intelligere, et sic in infinitum. (52) St. Thom. in Meta. V, lesson XI, no. 912

The eternal movement of the Fire in Heraclitus is like the movement of the intellect which takes one simple concept and tries to create otherness out of it. Heraclitus, however, realizes the tentative character of this movement; he knows that in spite of what the senses tell him about change and diversity, there are nothing other but manifestations of the one, eternal Fire "that judges all." Thus Fire, though ever moving along the Way Down, is at the same time always coming back to itself at definite cycles, and therein it sees that what men judge to be diversity is nothing else than Fire. Thus does Fire swallow up diversity, and eternity swallow up time.

Heraclitus has been invoked as the father of pluralistic philosophy, because all the emphasis has been put on one side of his doctrine. The most important element in his philosophy, however, according to Heraclitus himself is the doctrine of the One. It is the
doctrine of the Fire, of the Logos that is present in all things, that
directs all things. Fire judges all diversity and finds that diversity
of this world is but a movement towards separation from the one Fire, a
movement that will never reach otherness, just as a polygon will never
become a circle, just as one will never become two.

Wisdom for Heraclitus is the knowledge that
the diversity has its origin in the One and is nothing other real
than the One. Wisdom is seeing the relationship of origin of the many
in the one, most universal cause. That is why a man is not wise merely
because he knows many things --- he must see the many in the One in
their order of procession.

This definition of wisdom sounds so much like
the Aristotelian definition that they might appear to be essentially
the same. The best treatment of wisdom in Aristotle is found in the
first book of the Metaphysics together with the commentary of Saint
Thomas.

It is the function of wisdom to order. Now the
man who is best fitted to order and direct others is the one who is the
most intelligent. Likewise the science that is to direct other sciences
and other knowledge should be that which is the most intellectual. The
science which is the most intellectual is that which is a) most certain;
b) most universal; c) most removed from the principle of variability,
that is, matter. Wisdom, consequently, is knowledge through causes
(for this is the most certain) of objects that are most universal and
most necessary.

Omnes autem scientiae et artes ordinantur in unum, scilicet ad hominis perfectionem, quae est ejus beatitudo. Unde necessae est quod una earum sit aliarum omnium rectrix, quae nomen sapientiae recte vindicat. Nam sapientis est alios ordinare.

Quae autem sit haec scientia, et circa qualia, considerari potest, si diligentius respiciatur quomodo est alius idoneus ad regendum. Sicut enim, ut in libro praedicto Philosophus, dicit, homines intellectu vigentes, naturaliter aliorum rectores et domini sunt: homines vero qui sunt robusti corpore, intellectu vero defectientes, sunt naturaliter servi: ita scientia debet esse naturaliter aliarum regulatrix, quae maxime intellectualis est. Haec autem est quae circa maxime intelligibilia versatur.


Secundo ex comparatione intellectus ad sensum. Nam sensus sit cognitione particularium, intellectus per hoc ab ipso differre videtur, quod universalis comprehendit. Unde et illa scientia maxime est intellectualis, quae circa principia maxime universalia versatur. Quae quidem sunt ens, et ea quae consequuntur ens, ut unum et multa, potentia et actus. Huiusmodi autem non debent omnino indeterminata remanere, cum sine his completa cognitione de his, quae sunt propria alicui generi vel speciei, haberi non possit. Nec iterum in una aliqua particulari scientia tractari debent quia cum his unumquodque genus entium ad sui cognitionem indigeat, pari ratione in qualibet particulari scientia tractarentur. Unde restat quod in una communia scientia huiusmodi tractentur; quae cum maxime intellectualis sit, est aliarum regulatrix.

Tertio ex ipsa cognitione intellectus. Nam unaquaeque res ex hoc ipso vim intellectivam habeat, quod est a materia immunes, oportet illa esse maxime intelligibilis, quae sunt maxime a materia separata. Intelligibile enim et intellectum oportet proportionata esse, et unius generis, cum intellectus et intelligibile in actu sint unum. Ea vero sunt maxime a materia se-
parata, quae non tantum a materia signata abstrahunt, "sicut formae naturales in universali acceptae, de quibus tractat scientia naturalis" sed omnino a materia sensibili. Et non solum secundum rationem, sicut mathematica, sed etiam secundum esse, sicut Deus et intelligentiae. Unde scientia, quae de istis rebus considerat, maxime videtur esse intellectualis, et aliarum princeps sive domina. (53) St. Thomas, Prooemium ad Meta.

The person who best knows the causes, the reasons, for something is best able to direct. And his knowledge is the more certain the more profound is his knowledge of the causes that enter into play in the object of his knowledge. Relating this to Heraclitus it would mean that the knowledge that the Fire is the Source and the End of all diversity in the universe is truly wisdom.

Secondly, wisdom is characterized by universal knowledge as contrasted with the knowledge of singulars. It is the function of the senses to know singulars. Everything that our senses come into contact with in the universe is a singular. Heraclitus says that the knowledge of many things is not wisdom, but rather the knowledge of the One that permeates all things. Heraclitus has a disdain for those who regulate their lives according to the knowledge of the senses alone: first of all, because the senses deceive; and secondly, because they give us only one side of the picture, the diversity, and tell us nothing of the fundamental sameness that underlies all.

Thirdly, wisdom has as its object that which is most removed from the principle of variability which is matter.
Consequently, when there is a complete separation from matter, we have an object that is invariable in itself, is necessary, is eternal. Wisdom in the philosophy of Heraclitus looks away from the changing universe to the Fire, which is Eternal and Necessary and always the same in itself. Heraclitus did not explicitly mention matter as the principle of mutability, but he did contrast the Fire which is light and ethereal with that which is heavy, like earth and water. When Fire is united to these latter it is on the Way Down; when it leaves these in its Way Up, it regains its original perfection.

Marxists consider matter to be at the root of all things, even of the perfection called Mind. There is only one thing in the whole universe that remains fixed and eternal — it is matter. Heraclitus looked upon matter as the antithesis of Fire. When Fire became united to matter, it was on the Way Down; it was in the process of losing those attributes which belong to perfect Being. Heraclitus considers matter to be the destruction of Mind rather than its underlying principle. This is but another point in which the apparent continuity of dialectical materialism with Heraclitean philosophy is shown to be but an illusion.

In Heraclitus we have already a real advance towards the notion of Wisdom. Because of his imperfect understanding of the analogy of Being, however, the doctrine of Heraclitus might appear to approach more closely to the attempts of modern logico-
mathematicians to reduce all diversity to homogeneity.

In our study of the method of limits when applied to Parmenides and Heraclitus, we saw that the mind attempted to bridge the gap between two concepts that are formally distinct. Thus the mind tried to create, by its native power, the 2 from the 1; likewise it tried to make the circle with only a polygon as its working material. Now wisdom will consist, for the Hegelian and for the modern logico-mathematician in reducing the numerous formally distinct concepts to one concept, with the purpose of seeing that which is distinct in that which is but one. This attempt is brought out very clearly in the attempt by Meyerson to reduce science to unity.

L'idée centrale d'Emile Meyerson semble avoir toujours été la suivante : notre raison ne croit vraiment avoir compris un fait que si elle parvient à montrer comment ce fait était déjà contenu implicitement dans les faits antérieurs, à l'identifier en quelque sorte avec du déjà donné, préexistant à ce fait. De là vient pour lui l'importance dans toutes les branches de la science de la constatation des permanences; de là le rôle essentiel des principes de conservation dans les théories physiques et chimiques. Mais, en montrant cette tendance instinctive de notre raison, le grand philosophe en souli­gnait hardiment le caractère paradoxal, car l'effet identifica­teur de la raison, s'il pouvait complètement réussir, abouti­rait à l'abolition de toute diversité et de toute heterogénéité, c'est-à-dire à une espèce de négation de monde même qu'il cher­che à expliquer. Et si la raison parvient néanmoins à s'échap­per de ce cercle vicieux et à constituer une science qui incontes­tablement progresse, c'est, pense-t-il, qu'elle laisse se glisser dans nos constructions théoriques quelques éléments ir­rationnels dont l'introduction plus ou moins subreptice permet à l'ensemble de nos identifications successives de ne pas cons­tituer seulement une immense tuatologie. Comme toutes les doc­trines philosophiques de cette envergure la doctrine de Meyerson a été et sera discutée. (54)
There is a twofold reduction to unity in our science. The one is true wisdom, but the other is not. The reduction to unity through homogeneity is not wisdom, for this is a reduction to the universale in praedicando. It is true that this is most certain knowledge for us. But it is such because it is knowledge that is most in keeping with the potential character of our intellect. It is most certain because it is the least determined in itself. As Saint Thomas said in the preface to the Metaphysics, our knowledge cannot rest with those most universal metaphysical principles but it must continue and work out the particular sciences. The knowledge of those most universal metaphysical principles, where there is homogeneity because there is potentiality, is as Meyerson says knowledge that is but an "immense tautology".

In the reduction of the formally distinct concepts does not reach this homogeneity, then the only thing that is left is an evident contradiction. We have to say that one is the same as two; that polygon is the same as circle; that movement is the same as rest; that spirit is the same as matter. And this is the choice that Marxists make when faced with the dilemma.

True wisdom, on the other hand, is seeing the many in the light of the One. But here the One is taken as the Universale in causando. Wisdom is not mere homogeneity. Wisdom presupposes a knowledge of the diversity of things --- that is why wisdom presupposes the analogy of being. Wisdom is the knowledge of what is most actual
rather than of what is most potential. It is knowledge of what is most intelligible in se, consequently of what has the most perfect Form, since knowability comes by reason of the form. Wisdom is the knowledge of the One God Who is distinct from all other beings, the knowledge of the God who is like other beings in Nature by the tiniest bond of analogy of Being.

Wisdom does not do away with diversity, but it understands diversity more perfectly because it sees it in its Universal Cause. When individuals are seen in relationship to their Origin they are understood more perfectly in themselves, because their order of procession is a characteristic that attaches itself to each individually. This order is not seen when things are recognized only in their plurality.

When the philosopher tries to reach wisdom by reducing all to homogeneity he is substituting what is most imperfect for what is most perfect, what is most knowable for us as human beings for what is most knowable in itself. It is the reduction of the science that is most difficult to that which is easiest.

The following passages from Saint Thomas bring out the distinctions that must be made about certitude and intelligibility:

Istae igitur sunt tales opiniones, quas homines accipiunt de sapientia et sapiente. Ex quibus omnibus potest quaedam sapientiae descriptio formari: ut ille sapiens dicatur, qui scit omnia etiam difficilia per certitudinem et
causam, ipsum scire propter se quaerens, alio ordinans et persuadens. (55) in Meta. I, no. 43.

Ostendit quod omnia praeiecta conveniunt ei qui cognoscit primas causas et universales; et eo ordine prose­quitur quo supra posuit. Unde primo posuit quod habenti scien­tiam universalem maxime insit omnia scire; quod erat primum. Quod sic patet. Quicumque enim scit universalia, aliquo modo scit ea quae sunt subjecta universalibus, quia scit ea in illa; sed his quae sunt maxime universalia sunt omnia subjecta, ergo ille qui scit maxime universalia, scit quodammodo omnia.

(56) Ibid. no. 44.

Ostendit eidem inesse secundum, tali ratione. Illa quae sunt maxime a sensibilibus remota, difficilia sunt hominibus ad cognoscendum; nam sensitiva cognitio est omnibus communis, cum ex ea omnis humana cognitio initum sumat. Sed illa quae sunt maxime universalia, sunt sensibilibus remotissimam, eo quod sensus singularum sunt : ergo universalia sunt difficillima hominibus ad cognoscendum. Et sic patet quod illa scientia est difficillima, quae est maxime de universalibus.

(57) Ibid. no. 45.

Sed contra hoc videtur esse quod habetur primo Physicorum. Ibi enim dicitur quod magis universalia sunt nobis primo nota. Illa autem quae sunt primo nota, sunt magis facilita. Sed dicendum, quod magis universalia secundum simplicem apprehensionem sunt primo nota, nam primo in intellectu cadit ens, ut Avicenna dicit, et prius in intellectu cadit animal quam homo. Sic enim in esse naturae quod de potentia in actum procedit prius est animal quam homo, ita in generatione scientiae prius in intellectu concipitur animal quam homo. Sed quantum ad investigationem naturarum proprietatum et causarum, prius sunt nota minus communia; eo quod per causas particulares, quae sunt unius generis vel speciei, pervenimus in causas universales. Et autem quae sunt universalia in causando, sunt posteriorius nota quo ad nos, licet sunt prius nota secundum naturam, quamvis universalia per praedicationem sint aliquo modo prius quo ad nos nota quam minus universalia, licet non prius nota quam singularia; nam cognitio sensus qui est cognoscitivus simillium, in nobis praecedit cognitionem intellectivam quae est universalium. Factienda est etiam in hoc vis quod maxime universalia non dicit simpliciter esse difficil­lima, sed " fere Illa enim quae sunt a materia penitus se parata secundum esse, secit substantiae immaterialis, sunt magis difficil­lia nobis ad cognoscendum quam etiam universalia; et ideo sita scientia, quae sapientia dicitur, quamvis sit prima in dignitate, est tamen ultima in addiscendo. (58) Ibid. no. 46.
The distinctions between most knowable in se and most knowable quoad nos is a key for understanding not only the ancient Greeks but also all modern idealistic philosophies. And the confusion of these two comes, as we have seen, from a lack of understanding of the analogy of Being. We think that Heraclitus already had some idea of this analogy when he contrasted the Fire with the heavy elements of the Way Down.

We cannot agree with the Marxists that the Fire of Heraclitus is comparable to Matter in their own doctrine. The Fire is a divine Being, a Logos that is prior to the material universe, whereas Matter, in dialectical materialism, is opposed to the divine; it is irrationality. What is the most important attribute of the Fire is not its materiality but rather its directing force. Marxists say that Mind is the product of the evolution of matter; Heraclitus makes Mind prior to all evolution and all of Nature. Hence Heraclitus would be in Engels conception of philosophy an idealist.

Heraclitus wished to preserve God as pure as possible, as distinct as he could be from the material universe, without, however, losing any of his prerogatives as supreme Being. Thus he considered the divine nature as Fire, something light, pure and active. This he contrasted with the elements of earth and water. Here we have an approach to the immaterial Being who is the God of Platonic and Aristotelian philosophy. We should be most careful therefore when we call Heraclitus a materialist. He was still groping for an understanding
of spiritual substance. Thus he may be termed a negative materialist, in contrast with the positive materialism that is not merely an imperfect understanding of the nature of spiritual being, but is rather the positive denial of spiritual being. The Marxists belong to this latter class. Their's they have made the motto of Prometheus: "I hate all gods". And yet they consider their philosophy to be but an extension of the philosophy of Heraclitus for whom Wisdom consists in the knowledge of the One being that directs all things.
Empedocles:

Both because of his purpose and because of the content of his philosophy, Empedocles must be placed alongside of Heraclitus. Though the Marxists do not expressly claim a continuity with him, it is important for us to see that the doctrine of Empedocles confirms the analysis we have just made of Parmenides and Heraclitus.

His purpose was essentially the same as that of Heraclitus, namely to put God back into the universe --- from which the absolute interpretation of the One by Parmenides had tended to separate Him. The Parmenidean doctrine of Being absolutely distinct from the world of becoming seemed to both Heraclitus and Empedocles to endanger one of the supreme attributes of God, namely His causal bond with all that exists.

The Marxists however cannot invoke Empedocles as their forerunner, since he, too, spoke of a perfect and changeless God, a God who is perfectly One. Just as Heraclitus had done, Empedocles used the figure of recurring Fire to overcome what seems to be a contradiction: a God who is perfectly one, yet is intrinsically united to a world of change. The Sphairos, according to Empedocles, comes back to identity with himself in the world of change at fixed periods under the agency of the divine power of love. All the combinations and separations of the One, though in one sense real, are not absolutely
real. All change is overcome by the victory of Love.

The second extrinsic similarity with Marxist doctrine, the union of contraries, is also found in Empedocles. In the teaching of Empedocles Strife takes the place of the Way Down, while Love exercises the same function as the Way up in the Heraclitean doctrine. Marxists say that dialectical materialism, through its fundamental law of union of contraries, is only the scientific expression of something fundamental in nature, expressed long ago in poetical language by the ancients when the said that Love and Strife were principles of Nature.

The error of this interpretation comes when conflict is looked upon as the absolute, as that which accounts for all reality. The supreme Being is entirely overlooked, yet this is the most important element of the philosophy. The diversity that comes about through strife, the movement that characterizes the phenomenal world is not absolute. The One overcomes all this diversity and mutability.

Whereas Marxists would make diversity in the universe come through the blind activity of matter, Empedocles sees all things in nature as proceeding from the eternal One who gives harmony to the whole.

We shall give those fragments that are most striking in their similarity to Heraclitean doctrine.
On the union of contraries:

no. 17. I shall tell thee a twofold tale. At one time it grew to be one only out of many; at another, it divided up to be many instead of one. There is a double becoming and passing away. The coming together of all things brings one generation into being and destroys it; the other grows up and is scattered as things become divided. And these things never cease continually changing places, at one time all uniting in one through Love, at another each borne in different directions by the repulsion of Strife. Thus, as far as it is their nature to grow into one out of many, and to become many once more when the one is parted asunder, so far they come into being and their life abides not. But, inasmuch as they never cease changing their places continually, so far they are ever immovable as they go round the circle of existence.

no. 16. For even as they, Strife and Love, were avoretime, so too they shall be; nor ever, methinks, will boundless time be emptied of that pair.

no. 20. This (the contest of Love and Strife) is manifest in the mass of mortal limbs. At one time all the limbs that are the body's portion are brought together by Love in blooming life's high season; at another, severed by cruel Strife, they wander each alone by the breakers of life's sea.

no. 21. Come now, look at the things that bear witness to my earlier discourse, if so be that there was any shortcoming as to their form in the earlier list. Behold the sun, everywhere bright and warm, and all the immortal things that are bathed in heat and bright radiance. Behold the rain, everywhere dark and cold; and from the earth issue forth things close-pressed and solid. When they are in strife all these are different in form and separated; but they come together in love, and are desired by one another.

no. 26. For they prevail in turn as the circle comes round, and pass into one another, and grow great in their appointed turn. There are these alone; but running through one another, they become men and the tribes of beasts. At
one time they are all brought together into one order by Love; at another, they are carried each in different directions by the repulsion of Strife, till they grow once more into one and are wholly subdued. Thus in so far as they are wont to grow into one out of many, and again divided become more than one, so far they come into being and their life is not lasting; but in so far as they never cease changing continually, so far are they evermore, immovable in the circle.

Fragments on the One:

11, 12: Fools, for they have no far-reaching thoughts, who deem that what before was not comes into being, or that aught can perish and be utterly destroyed. For it cannot be that aught can arise from what in no way is, and it is impossible and unheard of that what is should perish; for it will always be, wheresoever one may keep putting it.

13: And in the All there is naught empty and naught too full.

14: In the All there is naught empty. Whence, then, could aught come to increase it?

27: There (in the sphere) are distinguished neither the swift limbs of the sun, nor, nor the shaggy earth in its might, nor the sea — so fast was the god bound in the close covering of Harmony, spherical and round, rejoicing in his circular solitude.

27a: There is no discord and no unseemly strife in his limbs.

28: But he was equal on every side and quite without end, spherical and round, rejoicing in his circular solitude.

35, 36: But now I shall retrace my steps over the paths of song that I have travelled before, drawing from my saying a new saying. When Strife was fallen to the lowest depth of the vortex, and Love had reached to the centre of the whirl, in it do all things come together so as to be one only; not all at once, but coming together at their will each from different quarters; and, as they mingled, strife began to pass out to the furthest limit; yet many things remained unmixed, alternating with the things that were being mixed, namely, all that Strife not fallen yet retain-
ed; for it had not yet altogether retired perfectly from them to the outermost boundaries of the circle.

Fragments on wisdom, the knowledge of the One:

no. 132: Blessed is the man who has gained the riches of divine wisdom; wretched is he who has the dim opinion of the gods in his heart.

no. 133: It is not possible for us to set God before our eyes, or to lay hold of him with our hands, which is the broadest way of persuasion that leads into the heart of man. (59)

Empedocles is a confirmation of the point we wanted to make earlier, that Parmenides and Heraclitus are more alike than unlike. For in Empedocles we have the main points of doctrine of both --- the One of Parmenides who is like a perfect sphere, together with the world of the senses which cannot give us the One; and we have the eternal and ever recurring Fire of Heraclitus which is one, while at the same time we have the eternal becoming through the contrary principles. Empedocles permits us to see the parallels between the two seemingly opposite doctrines.
The study of Greek atomism is very important as a background for an understanding of Marxism. The two most important doctrines through which Marxists claim a continuity with Greek atomism are, firstly, the doctrine of becoming, and secondly, the doctrine of chance in the universe. We shall study each of these in detail in order to see how far we can admit the Marxist claims of continuity of doctrine.

### Atomistic doctrine of becoming:

The atomists felt that the antinomy between the world of Being and the phenomenal world should not be expressed in the manner in which Parmenides had done. They felt that Parmenides had not sufficiently given account of the phenomenal world. They wanted to show that there could be an essential bond between the unchangeable Being and the world of change, without destroying the perfection of Being. Indeed, the perfection of Being would be increased, because it would now be given an active form (Motion), which was absent from the Being of Parmenides. Parmenides had excluded it, because he could see no way of admitting it without destroying the immutable character of the Supreme Entity.

The solution of the Atomists, in general,
consists in the substitution of an infinite number of tiny Forms which have the characteristics that Parmenides attributed to the one Being. Each of these tiny, invisible Forms is indivisible, continuous throughout, eternal, invariable, perfect, and, in addition to all these, is mobile. We can see already the form that the doctrine of the Atomists will take --- the perfect Being of Parmenides is preserved, but at the same time, there can take place various combinations and separations of the perfect Being. The Atoms in themselves are eternal and necessary --- and this remains the world of Being ---, but the groupings of atoms takes place in time and these formations change --- this is what corresponds to Parmenides world of phenomena. We can also compare this to the eternal Fire of Heraclitus which is one and eternal, and to his \[ \pi \nu \tau \varepsilon \nu \tau \varepsilon \] which takes place in time.

A second element is now introduced in the doctrine of the Atomists; this is the Void, which permits the movement of the Atoms so that the various combinations and separations can take place. Since the Forms (the Atoms) are continuous, full Being throughout, and are incapable of internal change and movement, all change and movement of phenomena must depend on the introduction of some other kind of reality, which must be so conceived as to permit the Forms to exercise their causal power. The other kind of reality may be regarded in two ways: from one point of view, it will be that which separates the Forms and prevents them from coalescing into the immovable, immutable Being of Parmenides, and from another point of view it will be the
opposite for the Forms. The Forms are full, but this new reality must be empty of Being; the Forms are Being, and this new reality is non-Being. Parmenides had denied the existence of non-Being, on the grounds that this would have given in an attribute that belongs essentially to Being. But, the Atomists, reply, if non-Being is not a reality, then the infinite and indivisible Forms would remain as sterile and as motionless as the One Being of Parmenides.

This non-Being, which is a reality, is called Space or the Void. It is this which permits the movement of the Forms. This Space is just the contrary of Being, the Continuum, in which nothing can move; it is absolutely empty of all Being. Space, as it were, tends to the destruction of the Plenum in so far as it can. It cannot destroy the eternal and necessary continuity of the Atom in itself, but it can separate one Atom from another and keep them from forming into one mass in which there is no separation. We can consider this a kind of conflict between Being and non-Being, a doctrine we shall consider at length in the Marxists. Being, according to its own nature, tends ever towards perfect continuity and homogeneity, while Space tends to create heterogeneity in the universe.

The conflict between Being and non-Being gives rise to becoming in the phenomenal world, as well as to passing away. The Forms move in the Space, but the force is given to the Forms through the whirling of the Vortex in which the Atoms are flying about as loose bodies. The shape and the size of the Atoms determine the combinations to a great extent, because those Atoms that have jagged edges will fit
together as well as they can with other Atoms with such edges. Likewise the bigger Atoms will come together because these (as the Atomists thought) have greater weight and so will fall with the same speed in the Vortex, while smaller Atoms will fall at a slower speed.

It is evident from this that there cannot be any real becoming in the Aristotelian sense in such a phenomenal world. We call it a phenomenal world, not because it is unreal, but because this is the world of the senses. This is the reality that is presented to sight, to touch, to taste, to smell, to hearing, while the unchangeable world of the Forms is the object of the intellect. We shall later compare the Wisdom in the Atomistic doctrine with that of the other Greeks. The only becoming and passing away consists in the new combinations of Forms or in their separation —— Forms which remain eternally the same.

The Forms are said to be infinite in number. In this infinity there is the minimum of diversity required to explain the heterogeneity found in the universe. The Forms (atomoi) differ only in shape and size. Formal differences in the universe come about through the combination and separation of the Forms after they are given a propulsion by the whirling of the Vortex. This doctrine calls to mind the statement of Descartes, that he could construct any natural universe, once he had extension and motion.

It is already clear that this teaching differs
from Marxism which decries the need of a force extrinsic to matter to explain becoming. This is the very weakness Marxism said it found in classical materialism...it meant dependence of a First Mover.

The nature of the Vortex is not explained. What gives rise to the whirling motion? The Atomists hold that it was always in motion. It is an eternal motion. We could very well explain this in terms of Prime Mover in Aristotelian philosophy. But of its nature the Atomists are silent --- as least as far as we can judge from the writings we have. One thing, however, seems certain: there is need of some Force extrinsic to the universe and even extrinsic to the infinite number of Forms in order to explain becoming. In this respect, the Atomistic doctrine differs essentially from the Marxist, who give to matter an intrinsic principle of motion.

We shall now quote at length the sources we have for the Greek Atomistic teaching.

Simplicius, Physics, 28, 4 :

Leucippus of Elea or of Miletus (both accounts are given) shared his philosophy with Parmenides, but did not follow the same method that Parmenides and Xenophanes followed in the explanation of things that are, but, as it appears the opposite method. They had represented the All as One, immovable, eternal and limited, and did not permit even the investigation of non-Being; Leucippus assumed infinite and forever moving elements, the indivisible Beings, and an Infinite number of Forms among them, because there is no real difference in quality in any phenomenon, and because he saw incessant coming into being and change in things that are. Moreover Being does not
exist any more really than non-Being. For he assumed that the Being of the indivisible Beings was compact and full, and he called it What Is (Being), and said that it moved in the Void, which he called non-Being, and which he said existed no less than Being.

And similarly his comrade Democritus of Abdera established the Full and the Void as first principles, and called one of them Being and the other non-Being; for Leucippus and Democritus assume the indivisible Beings as the matter of beings that are, and by the differences in the Beings they produce everything else. These differences are three: Form (\( \rho \nu \sigma \mu \eta \delta \) ), Turning (\( T^\circ \)) , and Contact (\( \chi \iota \delta \gamma \lambda \) ), and they have the same meaning as Shape (\( \sigma \chi \omega \mu \alpha \) ) Position (\( \theta \varepsilon \sigma \iota \) ), and Arrangement (\( T^\circ \)). For by nature like things are moved by like things, and things that are akin rush together, and each of the Forms, when it is arranged in a different combination of Forms, produces a different arrangement; so that they claimed with good reason that since these first principles were infinite they would produce all substances and all modifications of them. Accounting both for the cause of everything that comes into being and for the manner in which it comes. Wherefore they even make the claim that only those philosophers who represent the elements as infinite can argue that all things take place in accordance with Reason. And they say that the number of Forms, among the indivisible Beings, is infinite, because there is no real difference in quality in anything. This, they say, is the cause of infinity. (i.e., of the infinitely different qualities apparent in phenomena, which qualities do not really exist.) (60)

Theophrastus, Opinions, Book I,

They made the All one, immovable, uncreated, and finite, and did not even permit us to search for elements, namely, the atoms. And he made their forms infinite in number, since there was no reason why they should be of one kind rather than another, and because they say that there was unceasing becoming becoming and change in things. He, further, held that what is is no more real than what is not, and that both are alike causes of things that come into being: for he laid down that the substance of the atoms was compact and full, and he called them what is, while they moved in the Void which he called what is not, but affirmed to be just as real as what is. (61)

Aristotle, de Gen. et Corr., A, 8, 324b 35:

Leukippos and Demokritus have decided about all things practically by the same method and on the same theory, taking as their starting point what naturally comes first. Some
of the ancients had held that the real must necessarily be one
and immovable; for, said they, empty space is not real, and
motion would be impossible without empty space separated from
matter; nor, further, could reality be a many, if there were
nothing to separate things. And it makes no difference if any
one holds that the All is not continuous, but discrete, with
its parts in contact, instead of holding that reality is many,
not one, and that there is empty space. For if it is divisible
at every point there is no one, and therefore no many, and the
Whole is Empty; while, if we say it is divisible in one place
and not in another, this looks like an arbitrary fiction; for
up to what point and for what reason will part of the Whole be
in this state and be full, while the rest is discrete? And,
on the same grounds, they further say that there can be no
motion. In consequence of these reasonings, then, going beyond
perception and overlooking it in the belief that we ought to
follow the argument, they say that the All is one and immovable,
and some of them that it is infinite, for any limit would be
bounded by empty space. This, then, is the opinion they express­
ed about the truth, and these are the reasons which led them to
do so. Now, so far as arguments go, this conclusion does seem
to follow; but, if we appeal to facts, to hold such a view looks
like madness. No one who is mad is so far out of his senses that
fire and ice appear to him to be one; it is only things that are
right, and things that appear right from habit, in which madness
makes some people see no difference.

Leukippos, however, thought he had a theory
which was in harmony with sense, and did not do away with coming
into being and passing away, nor motion, nor the multiplicity of
things. He conceded this to experience, while he conceded, on
the other hand, to those who invented the One that motion was
impossible without the Void, that the Void was not real, and that
nothing of what was real was not real. "For", said he, "that
which is strictly speaking real is an absolute plenum; but the
plenum is not one. On the contrary, there are an infinite number
of them, and they are invisible owing to the smallness of their
bulk. They move in the void (for there is a void); and by their
coming together they effect coming into being; by their separation,
passing away".

Aristotle, de Gen. et Corr., 315 a 34:

In general no one made any more than a super­
ficial inquiry into these problems except Democritus; he seems to
have studied them all, and is far superior in his method. For, as
we are saying, none of the other philosophers made any definite
statement about growth, except such as any amateur might have made; they said that things grow when like joins like, but they did not explain the process, nor did they give any account of combination, or of any of the other problems, such as action and passion, how in all actions in nature one things acts and another is acted upon. But Democritus and Leucippus assume the Forms and make alteration and coming to be result from them; they explain coming to be and perishing by the dispersion and the union of the Forms, and alteration by their arrangement and position. And since they thought that the truth lay in the appearance, and the appearances are opposite and infinite, they made the Forms infinite, so that by reason of the changes in any compound the same thing presents opposite appearances to different people; its movement changes when a small addition is made of it, and it appears totally different when the position of one thing is changed. (62)

Diogenes Laertius, IX, 31:

The All is infinite; part of it is full, and part of it void, and these he calls elements. From these the infinite universes are derived and into them they are dissolved. In this way universes come into being; many 'bodies of all sorts of Shapes are cut off from the Infinite and rush into a great void; these gather together and form a single revolution, in which they jostle and revolve in every way, and finally separate, like joining like. And since owing to the crowd they can no longer revolve in equilibrium, the fine Shapes depart to the outer void, as if sifted out; the rest stay together and becoming entangled run down together with each other and form a kind of first spherical system. (63)
There are two kinds of simplicity which lie in wholly opposite directions. A gas, for example, will be called simple if it is made up of one kind of atoms. A universe made up of homogeneous elements is simple in this material sense. On the other hand, a whole may be called simple when, notwithstanding their great variety, its parts are harmoniously coordinated in view of some definite function. Thus, notwithstanding its greater complexity of parts, a modern automobile will operate more simply than the earlier type; and the movements of a tiger are more simple than those of a truck. In these particular examples, formal simplicity can be realized only by means of what is materially highly complex.

The atomist school of philosophy has not taken this distinction into account. Indeed all science tends toward simplicity. But the simplicity it tends toward is not of one type alone. Material reality involves both types of simplicity. We must indeed try to account for as much as we possibly can by material simplicity. But we shall not fail to distort reality if we refuse to recur to anything but material simplicity.

A great variety of constructions can be made with the same building material. But it is not just the building material that accounts for this variety. We must not forget the structure...
itself and the cause of the structure as such. Indeed the building material has been prepared for the sake of buildings, and the buildings for the sake of inhabiting. If we refused to consider anything but the building material, then the buildings and their variety could be explained only as fortuitous conglomerations of bricks, boards, etc. A house would be such or such, according as the building material happens to be together in such or such a way. It would therefore be more correct, in this view, to say that the material has "fallen together" in such or such a way, than to say that it has been "brought together" in this or that way.

Although the ancient Greek atomists certainly did not hold exclusively this view, not even in their doctrine of chance, it is nevertheless this part of their philosophy which has come down to us as typical of atomism. And this is in fact the only part of Greek atomism that the marxists care to remember: an atomism which prescinds from formal and final causality, at least as far nature is concerned.

The present state of our universe, they say, is due to pure chance, to the "blind movement of matter". They will not even admit the use of the term "evolution", both because this is opposed to their doctrine of violent change and because it already implies a certain direction on the part of matter. Nature develops through violent destruction of previous forms, through jumps, without
direction of any kind.

It is true that, in constructing things, the form of the work come from us. The work of art is well known to us because it was born from our own understanding. The differences of houses come from us. But the differences in nature do not come from us. Just as to understand what a hammer and a sickle are we must know their purpose, we must know why they are "this way", so, in order to know natural things in the manner in which we know the works of human art, we must know their purpose. Otherwise we are like savages who, visiting a workshop, see all that is there without really seeing it.

In natural science we attempt to reduce the material manifold by the search for uniformity, recurrence, regularity; we attempt to unify the laws by means of simple hypothesis, etc. We try as much as possible to see the many as instances of the same. This does not mean that the aim of science is to do away with all formal differences. However, atomism, or that part of it which history has emancipated, seems to hold that differences are accounted for only when we have somehow suppressed them. They would not deny that there are differences, nor that they should be brought about. But they would deny the differences as having absolute primacy over the stuff of things. They would deny that material differences are for the sake of form. (64) Formal differences are considered as obstacles to thorough understanding.

Now there is some truth in this position.
Nothing is knowable except through its form. But what is most knowable in itself is least known to us. What we know first and best is confused universality. Our mind is at home only in twilight reality, as Aristotle said. (65) Our intellect can operate only in the face of beings comprising a certain amount of objective obscurity. Potentiality is responsible for objective obscurity. Because of their greater knowability in se, formal differences are less known to us. But to reduce the formal differences to what is most knowable to us is to reduce the very nature of the universe. This would mean that man is "explained" when prescinding from his formal difference, rationality, we consider him merely as an animal.

We agree that formal differences are less knowable to us. In this sense they are relatively irrational. There is, then, a heterogeneity which is an obstacle to knowledge. But the solution to this difficulty must not consist in reducing the status of the object, but rather in lifting the status of the knower.

The exact extent to which the following consideration would apply to Democritus is uncertain, but it does apply to the marxist understanding of him. How can we overcome natural heterogeneity without accepting it in its absolute priority and intelligibility? How can form become subservient to matter? It is because the marxists make such a great case for the "materialism" of the Greek atomists that we must examine it carefully.
There are two fundamental types of heterogeneity: that of incongruous assemblage, such as a junk-pile where a variety of objects just happens to be together, and that of an orderly, reasonable ensemble. The first is purely material, the ensemble has come about without any purpose except keeping certain objects together in no matter what fashion. Chance may account for such a kind of order. Chance is an irrational cause. If the effect of chance serves a purpose, the purpose was not intended by the cause that is chance. Thus chance is an irrational cause in natural things, just as fortune is an irrational cause in human actions.

Unreason, then, can account for a certain type of heterogeneity. Can it account for both kinds of heterogeneity? Chance is an accidental, indeterminate cause in those things which happen for the most part by nature. Hence, there is finality in chance, but the end in question is not an end intended. It just happens to coincide with an intention, an intention of achievement or of avoidance. Hence, a formal heterogeneity may be brought about by chance. But, and this is essential, this heterogeneity must still be defined through nature, just as chance itself supposes nature and action for an end. Without reference to finality achieved by intention, chance is meaningless even as chance.

Chance is an irrational cause. An irrational cause may be the cause of a rational end. But if all causes were irratio-
nal, no end would be rational. Now, if homogeneous elements were to account sufficiently for the heterogeneity of the universe, it could only be the product of chance. Better, it could not even be the product of chance, since chance has no meaning outside of rational finality.

Let us suppose for one moment, merely for the sake of argument, that all things do come about by chance. It would follow that there never could be but the appearance of rationality, the appearance of form. Reason itself would be but an appearance. And reason would be most reasonable when it leads everything back to unreason. The complete rationalisation of the universe would consist in making it fundamentally irrational. Reason itself would be the product of unreason, of irrationality.

We have conceded that there is a respect in which that which is most intelligible in itself is most irrational to us. But the cause of this irrationality is in us. In this connection we must again distinguish two types of heterogeneity. One which is on the part of the things known and which comes from their difference of form; the other which is on the part of our intellect in the very means by which we know different natures. For each nature distinctly known, we have a distinct intelligible species. Thus the intelligible species by which we know circle is distinct from the species by which we know polygon. The heterogeneity of things can be known by us only through heterogeneous species. This last heterogeneity has its proper cause in
the very imperfection of our intellect. Perfect knowledge would attain the differences of things through one single means of knowing. (66) The heterogeneity of intelligible species has its cause in the imperfection of our intellectuality; it is, in this sense, a consequence of irrationality.

To what extent the Atomists identify these two is not clear — there is evidence for and against the identification. But it is clear the Marxist philosophers do identify them, since they say that every form in nature comes about through the blind movement of matter, even the highest form of all, the human intellect.

We have only one fragment of the writing of Leucippus, the founder of the school of Atomism. It is this:

"Nothing comes into being by chance, but all according to reason." (67)

This fragment seems to do away entirely with chance, yet other writers, in speaking of Leucippus and Democritus said that the Atoms come together and separate through chance. The solution seems to be contained in Aristotle's reference to the Atomists.

There are some, too, who ascribe this heavenly sphere and all the world to chance. They say that the vortex arose spontaneously, i.e. the motion that separated and arranged in its present order all that exists. This statement might well cause surprise. For they are asserting that chance is not responsible for the existence or generation of animals and plants, nature or mind or something of the kind being the cause of them (for it is not any chance thing that comes from a given seed but an olive from one kind and a man from another); and yet at the same time they assert that the heavenly sphere and the divinest of visible things arose by chance, having no such cause as is assigned to
Is chance the first cause of the universe according to the Atomists? As far as the individual natures in the cosmos are concerned, they say that these are the work of a Mind or Reason. But the heavenly bodies, which for the Greeks were superior to the mobile things of the phenomenal world, and were, in fact, considered the proximate cause of the phenomenal world, these were due to chance. But, as Aristotle points out, the phenomenal world should rather have been thought the work of chance rather than the heavens, because of the irregularity often found in nature. To the ancients the heavens appeared to have absolute determination in their movement.

Aristotle says that chance cannot be a cause prior to intelligence, because chance is an accidental cause. If we do admit, he says, that the heavens did come about through chance, then we must posit prior to this a per se cause which acts according to intellect.

Fortune and chance are causes of effects which, though they might result from intelligence or nature, have in fact been caused by something incidentally. Now since nothing which is incidental is prior to what is per se, it is clear that no incidental cause can be prior to a cause per se. Fortune and chance, therefore, are posterior to intelligence and nature. Hence, however true it may be that the heavens are due to spontaneity, it
will still be true that intelligence and nature will be prior causes of this All and of many thing in it besides.

(69) Aris. Phy. II, c. 6, 198a 5.

Whether the Atomists thought there was an Intelligence prior to the motion of the Vortex in which the heavens came about through chance, we do not know. If they thought that chance was absolutely the first cause, and Mind itself comes about only through the various combinations of Atoms, falling together by chance, then they would be very close to the Marxist doctrine.

Like Parmenides and Heraclitus the Atomists recognize a world of fixed Being and a world of changing phenomena. And Wisdom consists in the knowledge of the former, while our opinions about the latter are often mistaken. Democritus and Leucippus also compare the permanent Being of the most perfect Atoms to the Fire of Heraclitus and to the Sphere of Parmenides.

Some say that what originates movement is both pre-eminently and primarily soul; believing that what is not itself moved cannot originate movement in another, they arrived at the view that soul belongs to the class of things in movement. This is what led Democritus to say that soul is a sort of fire or hot substance; his "forms" or atoms are infinite in number; those which are spherical he calls fire and soul, and compares them to the motes in the air which we see in the shafts of light coming through windows; (70)

Leucippus and Democritus assume that bastard knowledge belong to all these things, sight, hearing, smell, taste, touch; but legitimate knowledge is separated from this...(71)

Sextus Empiricus : VIII, 6, 71
Plato and Democritus both supposed that only the objects of thought really existed : Democritus believed because
there was no sensible substance underlying nature, since the
Indivisibles which formed all things by their combinations had
a nature devoid of all sensible quality;

Healthful Reason, which is the Sun of the
Psyche, can alone, when it has risen within the depth of the
Mind, illuminate the eye of the Psyche: when Democritus quite
rightly says that 'a few men, who possess Reason, stretch out
their hands towards that which we Greeks now call Air and
address it as Zeus; for Zeus knows all things, gives and takes
away all things, and is King of all things. (72)

So once again we have the doctrine of the
immutable One and the changing many. And corresponding to the One we
have wisdom while the knowledge of the world of becoming is the object
of the senses.
Anaxagoras:

Two principles govern the philosophy of Anaxagoras: the infinitely small and the Nous. It is true that Marxists have not claimed an essential continuity with the philosophy of Anaxagoras, yet there is a certain similarity between these two doctrines that future Marxists might try to exploit. It is the similarity on the point of the infinitely small, or, the principle: Quodlibet ex quolibet. Now the Marxists, who hold that all reality has as its basis matter, might conceive of this latter as a mere clarification of Anaxagoras' teaching. And secondly, there is another similarity in that the Marxists, too, speak of the infinitely small when they propose certain arguments for dialectical contradiction from the field of mathematics. We shall what the infinitely small of Anaxagoras is, so that we may later compare it with the Marxist notion.

How does Anaxagoras arrive at his infinitely small? Aristotle's probable explanation follows:

The theory of Anaxagoras that the principles are infinite in multitude was probably due to his acceptance of the common opinion of the physicists that nothing comes into being from non-Being. For this is the reason why they use the phrase 'all things were together' and the coming into being of such and such a kind of thing is reduced to change of quality, while some spoke of combination and separation. Moreover, the fact that the contraries proceed from each other lead them to the conclusion. The one, they reasoned, must have already existed in the other; for since everything that comes into being must arise either from what is or from what is not, and it is impossible for it to arise from what is not (on this point all the
physicists agree), they thought that the truth of the alter-
native necessarily followed, namely that things come into being
out of existent things, i.e. out of things already present, but
imperceptible to our senses because of the smallness of their
bulk. So they assert that everthing has been mixed in every-
thing, because they saw everthing arising out of everything.
But things, as they say, appear different from one another and
receive different names according to the nature of the particles
which are numerically predominant among the innumerable constitu-
ens of the mixture. For nothing, they say, is purely and
entirely white or black or sweet, bone or flesh, but the nature
of a thing is held to be that of which it contains the most. (73)

The principle regarding the infinitely small
is expressed in Latin either as : Quodlibet ex quolibet; or as :
Quodlibet in quolibet. They both fundamentally mean the same. There
are portions of everything present in every other thing; and every-
thing that comes to be now has already existed in act in some other
combination.

However small any portion is, it will always
continue to contain portions of everything else. Thus the infinitely
small means that none of the elements that enter into the composition
of the material universe can be exhausted; nor can any element every
be completely separated from the rest of the physical world. Conse-
sequently, there is never a greatest or smallest portion of that which
makes up the cosmos. (74)

We can consider the infinitely small of
Anaxagoras to be somewhat like matter in the doctrine of Aristotle.
For it is the infinitely small that enters into all compositions
in nature. If we were to judge the nature of the infinitely small only from this angle, however, we should have to say that it differs essentially from the matter of Aristotle, since the infinitely small according to Anaxagoras is always in act. Nothing, according to him, comes to be except from what is already in act. And in the Aristotelian doctrine matter is not act, but potency. If we conclude from what is implicitly contained in Anaxagoras, however, we can say that he already approached the Aristotelian notion of matter and potency. Since the infinitely small is divisible, this means that already potency — potency to division — is accepted. And secondly, this is called infinite divisibility, which is comparable to the infinite capacity of matter for corporeal forms. Matter is capable of receiving an infinite variety of natural forms, even though they cannot be received simultaneously.

Anaxagoras makes the infinitely small divisible *ad infinitum*, in order that his principle, *Quodlibet ex quolibet*, might be saved. If anything comes from anything else, if any nature contains within itself portions of every other nature, then there must be divisibility *ad infinitum*, otherwise a condition would be reached by simple division where certain natures or elements would have separate existence.

The following are the fragments on the infinitely small:

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*[Footnotes and additional context here if necessary]*

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Fragment no. 1: All things were together, infinite both in number and in smallness; because the small was infinite. And when all things were together, nothing could be seen, because of the smallness of everything; for Air and Aither held all things strongly, being both of them infinite; for among all things taken together Air and Aither are the greatest both in quantity and in magnitude.

no. 3: For there is no smallest of that which is small, but there is always a smaller; for Being cannot be non-Being. And there is always a greater of that which is great. And the quantity of the great is equal to the quantity of the small; and each thing by itself is both great and small.

no. 4: Since these things are so, we must think that there are many things of every sort in all the universes that are Being combined and that there are in them seeds of all things, and that these seeds have every sort of form and color and sensible quality. And human beings are put together, and all other animals, as many as have Psyche (life)...Before the separation took place, when all things were together, there was not even any color to be seen, for the mixture of all things prevented the mixture of moist and dry, of hot and cold, of bright and dark, and of much earth that was in it, and of a quantity of infinite seeds that were in no way like each other. Since these things are so, we must think that all things are present in the sum of Being.

no. 5: And after these things have been thus separated, we must know that the sum of all things is neither smaller nor greater, for it is impossible that there should be more than the sum of all things; but the sum of Being is always equal.

no. 6: And since the portions of the great and of the small are equal in quantity, but for this reason also all things must be in everything; for all things cannot be apart, for all things have a part of everything. Since the absolutely smallest thing cannot exist, it could not be separated, nor could it come into being by itself; but it was in the beginning so even now all things are together. Many things are present in all things, and they are equal in quantity, both in the greater and in the smaller of those things that are separated off.

no. 8: The things that are in one universe are not separated from each other, nor are they cut off by an axe, neither hot from cold nor cold from hot.

no. 11: in everything there is a portion of everything, except Mind, and in some things Mind also is present.
The following are the fragments on the Nous:

Frag. no 12: Other things have a portion of everything; but Mind is infinite and has sovereign power and is mixed with nothing, but is alone, itself by itself. For if it were not by itself, but were mixed with anything else, it would have a part of all things, if it were mixed with anything; for there is a part of everything in everything, as I have said in what goes before; and the things that would be mixed with Mind would hinder its action, so that it could not be supreme over anything in the same way that it is now when it is alone and by itself. For Mind is the most subtle of all things And the purest, and it possesses all knowledge about everything and has the greatest strength. And as many things as have
Psyche, both smaller and greater things, all have Mind from their supreme Ruler. And Mind was supreme over the whole revolution, so that the revolution took place in the beginning. And the movement of revolution began with that which was small, and it revolves over a greater spalce, and it will revolve over still more space. And Mind knew all the things that were mingled and separated and distinguished. And all the sorts of things that were to be and that were, including all those that do not now exist, and all the sorts that do now exist, all these Mind arranged into a universe, and it also arranged this movement of revolution in which the stars now eevolve and the sun and the moon and the Air and The Aither, that are separated...but nothing is wholly separated or distinguished from anything else except Mind.

no. 13 : And when Mind began to set things in motion, it was separated from all that was moved, and everything that Mind set in motion was rendered wholly distinct; and as things were set in motion and rendered distinct, the movement of revolution caused their distinctness to become much greater. (76)

The method of limits gives us a deeper insight into the philosophy of Anaxagoras, because it permits us to see more accurately the function of each of the principles: the infinitely small and the Nous.

According to our method of limits we may first of all consider the infinitely small as a variable. By this we mean that in every portion of everything, no matter how much it is divided, no matter into what degree the element is separated from the other elements, there can never be an ultimate separation of one element from all the others or from any single one of the others. There always has been and there will always be all elements in every individual portion. This is a variability, which is variable ad infinitum.

Now the variability comes about because of
the divisibility of the individual elements. There can be a greater or a lesser amount of an element in a combination. And this is how the Nous brings about the various combinations that appear to the senses. For example, it would use a great amount of one element and smaller amounts of other elements, and consequently the name that would be applied would correspond to the nature of the element that exists there in greatest abundance.

Finally, the ideal limit (and it is necessarily an ideal) is the absolute separation of one element from the others, so that it would have a separate existence. If that limit could be reached any change would be impossible after that, for it is absolute, homogeneous and separated from all other elements that could change it.

Thus the phenomenal world consists of the various combinations that the infinite variety of elements can assume under the direction of the Nous. This world is not stable; it is not homogeneous; it is not the absolute Being that would exist, if the Nous could so divide the Quodlibet in quolibet so that a smallest division would finally be reached, or so that by combining all the elements of one kind a maximum would be reached that would consist only of one kind — homogeneity absolutely speaking. Only complete separation could give one of the elements absolute Being.

The following diagram will illustrate the
phenomenal world and the unchanging world of absolute Being.

a) Quodlibet in quolibet \( n \) \( \rightarrow \) separation

b) Phenomenal world of change and multiplicity \( \rightarrow \) unchangeable world of absolute Being and homogeneity

c) \( 1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{6} \) \( \rightarrow \) 2

The phenomenal world, which is bound up essentially with the Quodlibet in quolibet cannot have the stability that would be reached at the ideal limit, where the element would attain absolute and distinct existence. The attempt to reach such a being cannot be realized, and consequently as long as we remain in a universe where we consider elements as the principles of being, we can never have being in the complete sense. The only Being that can be completely separated from the material universe is Nous. If per impossible one element could be entirely separated from the rest of the phenomenal world, that is from the other elements, this being would necessarily have to be identified with the Nous, which is a spiritual being. Such is evidently a contradiction.

Anaxagoras called upon the Nous, as we have said, to explain the world of becoming. Now he confused the general problem of
Becoming with the problem of Finality and Order in the universe. Because he did not explain Becoming through the intrinsic causes as Aristotle did, he had to have recourse to an extrinsic cause to explain it. That is why Aristotle finds fault with him. It is not because he introduced the supreme Nous, but because he introduced the Nous as a *deux ex machina* to explain becoming that should have been explained according to natural principles. And whenever Finality is required to explain something in Nature, then he has recourse to causes other than the Nous — thus not sufficiently stressing Nous.

For Anaxagoras uses reason as a *deux ex machina* for the making of the world, and when he is at a loss to tell from what cause something necessarily is, then he drags reason in, but in all other cases ascribes events to anything rather than to reason. (77)

And Plato criticises Anaxagoras for the same confusion:

Then I heard someone read out of a book which was, he said, by Anaxagoras that 'Mind forms the universe and is the Cause of all things', and I was delighted with this Cause, and I decided that Mind must really be in the same sense the cause of all things. If this is so, I thought, the Mind that is the source of universal Order must arrange each particular thing in the best possible way...and I rejoiced to think that I had found in Anaxagoras a man who would teach me about such a cause... I would not have sold my expectations even at a great price, but seized his books enthusiastically and read as fast as I could, in order to know at once the truth about what is better and what is worse. Farewell to my marvellous hopes. As I went on reading, I beheld a man who made no use whatever of Mind, who ascribed to it no role in the production of the cosmic order, but who on the contrary ascribed all causal action to Airs, and Aithers and Waters, and many other strange things. (78)
General conclusion of Anaxagoras:

The continuity of Anaxagoras' doctrine with that of the other ancient Greeks seems to us to be beyond serious doubt. The doctrine of the One, of the world of change, of Wisdom retains the same essential characteristics in all the ancient Greek "materialists". We do, however, have a certain progression, a certain perfecting of conception of the nature of the One supreme Being. Aristotle did not start without a long tradition behind him, when he gave the world his teaching on the nature of the Immaterial God that rules the world, nor was he without the beginnings of the doctrine of matter and form when he proposed the hylomorphic conception of the natural beings. The Greek materialists had conceived the notion of a God who is immutable, eternal, necessary, the source of all things, and apart from the world of change, at least in his own nature. And in contrasting the world of Being with the world of change, they compared God to Fire to Air, things which are pure and light, while in contrast with this the Many participates also in non-Being which is compared to earth and water, which are elements heavy, cold, and impure. Already, then, there is an approximation to the immateriality of the God of Plato and Aristotle.

General conclusion of historical part:

We do not find in the ancient Greeks anything
more than an accidental likeness with Marxism. We do not see upon what grounds Marxists can claim a continuity with Heraclitus, with Democritus, with Empedocles, or with any of the other early philosophers that we have considered. The fundamental difference, we believe, lies in this, that Marxists deny finality in nature, while the ancients, while not teaching it as clearly in Aristotle, at least advanced towards the doctrine of finality that was to be found later in Aristotle. Closely allied to the doctrine of finality is the teaching on the One Being who is separated from the phenomenal universe, which is, in fact, the Logos or Ratio that directs all things in the universe. The Marxists who refuse to admit any intelligence directing the universe, but who want to explain all movement through the intrinsic conflict of blind matter, cannot have a continuity with a philosophy which teaches the necessity of a Logos.

We certainly admit that the ancient Greeks did not clearly express the idea of spiritual substance — and because of this the Marxists want to make them materialists in the same sense in which they themselves are materialists. In order to express the difference between the Marxists and the ancients on this point, we can consider the development of the idea of God, of spiritual substance to be like the formation of a vase in the hands of the potter. The vase takes time to form. The advance in the knowledge of the Spiritual, with all the imperfection and crudeness of form through its period of being molded, is really the beginnings of the philosophy that was later to be
so highly developed by Aristotle. Now Marxism is the shattering of the vase that has been formed. Marxism is positive materialism; it is not merely an imperfect expression of the truth. The shattered parts of the vase still bear a certain resemblance with the original, just so does Marxism bear a certain resemblance with the philosophy of the ancient Greeks. But what is essential is no longer there. The pieces of a vase are not a vase. And all the attempts of Marxist philosophers to give rationality to the universe through their materialistic principles will be just as futile as throwing the pieces of vase into the air and expecting them to come down to earth ready to hold flowers. The positive materialism of Marxism is definitely distinct from the negative materialism of the ancients.

END OF HISTORICAL PART.
CLASSICAL MATERIALISM:

Classical materialism had an essential weakness, according to the advocates of dialectical materialism, for it remained bound to the static way of thinking that is characteristic of metaphysics. Because of their inability to think dialectically classical materialists were impotent in the face of Hegelian dialectics which better accounted for real becoming in the world. (79)

The classical materialists thought an explanation of all phenomena must be sought in the mechanical motions of qualitatively identical and unchanging units (atoms, electrons, etc. in our modern terminology). All qualitative differences among things are due to the difference in the position of these units, and to the difference in their simple mechanical motion, that is, movement in space. Hence quality does not exist in actual reality but depends entirely on our subjective perceptions. Objectively there exists only the mechanical motion of atoms and their quantitative relations. This materialism denies the higher forms of motion and reduces all movement to local motion.

Obviously such a reduction cannot be made.
This leaves the way open to the extreme of metaphysical thought, namely the existence of a Being extrinsic to the universe upon whom motion in the universe depends. (80) Mechanical motion is not self-explanatory; it is not self-sufficient. Some force external to the world must set in motion the gigantic mechanism that is the world. Mechanical motion has not an intrinsic source of power. The world according to this conception would need someone to wind up the power that is released in motion, like some giant clock in the hands of its maker.

To be valid materialism must be self-sufficient. It must contain within itself an energizing element that can account for every change in Nature. Mechanical motion, as we have seen must itself be explained. The classical materialists did not all receive the full heritage of mechanism from Descartes, for, as Marx says, "In his physics Descartes had invested matter with self-creative power and had conceived of mechanical motion as its vital act." Descartes had not, of course, developed the notion of matter as a sufficient production cause of all things for that was to come only with the dialectical materialists, through the use of Hegelian dialectics.

Mechanical materialism was unable to comprehend the universe as a process, as matter developing in a historical process. As Engels explains (81), this was in accordance with the level of the natural sciences at that time. It was held that motion turned eternally
in a circle and never progressed; it produced the same results over
and over again. The dialectical view of nature, according to which
matter itself was in a continual state of productive development
through intrinsic conflict, had not yet been conceived.

It was at this time that the classical German
philosophy, which was to have its culmination in Hegel, was born. Its
great merit was a dynamic view of reality. It went back to the early
Greek physicists and found, according to the Marxists, an explanation
in their dialectic of becoming through conflict even though the Greeks
held the solution only in a germinal state. (82) Through observation
and reflection Hegel worked out a complete Dialectic that completely
rationalized all movement in Nature.

Marxist Dialectic:

When they describe their dialectical method
Marx and Engels refer to Hegel as the philosopher who formulated the
main features of this Dialectic. Not that Marxist Dialectic and
Hegelian are one and the same thing. But the self-determining, (83)
revolutionary principle is present in Hegelianism. That is why Lenin
grew lyrical over what he found there. Writing to Maxim Gorky he
said: "By gad, the philosopher Hegel was right --- life does progress
by contradictions; and living contradictions are much richer, more
varied and pithier than the mind of man originally conceived." (84)
What remained to be done was "the setting Dialectic back on its feet".

By Dialectic Hegel meant the progress of thought by means of contradiction, the process of development toward a supreme and absolute Spirit. He emphasized the fact that this movement was self-motion resulting from an inherent impulse to development. But this Dialectic is idealistic in its origin, in its movement and in the end to which it moves. It is a logical deduction beginning which the notion Being had through negative abstraction; its progresses through categories that are deduced by the mind itself rather than by the action of an object (even though Hegel insists he does not deduce the categories but that they deduce themselves; its end is the Absolute Spirit, a pure conception of logic.

Ludwig Feuerbach (1804-1872), one of the most talented of the disciples of Hegel, examined his master's philosophy from this point of view. He upset Hegel's basic proposition by maintaining that consciousness does not determine being, but being determines consciousness. There not only exists a world which is independent of thought, but it is that world which causes thought. Not only that --- there was a time when there was being without consciousness, for Mind is but a form of that objective reality. Hegelian philosophy, according to Feuerbach, is but another theology. All theology, Feuerbach says in his *Essence of Christianity*, was created by man himself --- it is but a way of man's expressing what
he is in himself. (85)

Nature exists independently of man, and it is the foundation upon which human beings, themselves the products of nature, have grown up. Nothing exists outside nature and man, and the higher beings our religious fantasies have created are only the fantastic reflection of our own essence. (86)

The idealists under the leadership of Hegel tried to solve the antinomy between unity and multiplicity as well as that between being and thinking by reducing all to unity of thought. For Hegel, Thought is Being. But, Feuerbach, pointed out, it is not abstract Being which thinks, but it is real Being, namely, this person. And so, contrary to what the idealists assert, material Being is the subject, and thought is the attribute. And this is the only possible solution to an apparent contradiction between matter and spirit. With all his impulsive logical deduction Hegel must admit that Nature exists independently of the Thought that may be able to rationalize the existence of such a Nature, but can never create it nor destroy it. Thus, in attaining unity, Hegel suppressed the real and independent existence of matter. (87)

Through this critique of Feuerbach, Engels was able to write:

The unity of the world does not consist in its Being. The real unity of the world consists in its materiality, and this is proved...
by a long and tedious development of philosophy and natural science. (A.D. p. 54) But if the question is raised: what then are thought and consciousness, and whence they come, it becomes apparent that they are products of the human brain and that man himself is a product of nature, which has been developed in and along with its environment; whence it is self-evident that the products of the human brain, being in the last analysis also products of nature, do not contradict the rest of nature but are in correspondence with it. (88)

According to Hegel the dialectical movement apparent in nature and history, which asserts itself through all zig-zag movements and temporary setbacks, is only a faint copy of the self-movement of Ideas going on from eternity. This ideological conception had to be done away with — rather had to be reversed, for the dialectical movement of the mind was in reality only a reflection of the dialectical motion of the real world.

My dialectic method is not only different from the Hegelian, but is its direct opposite. To Hegel, the life-process of the human brain, i.e., the process of thinking, which, under the name of "the Idea", he even transforms into an independent subject, is the demiurgos of the real world, and the real world is only the external, phenomenal form of "the Idea". With me, on the contrary, the ideal is nothing else than the material world reflected by the human mind, and translated into forms of thought. (89)

Marxist Dialectic is the general movement and development caused by the conflict of contradictions that take place throughout the universe both in nature and in society, and which is reflected in human thought. Hegel's philosophy touched only an ideal world; it is theoretical. Marxist philosophy puts it hands on the
real world of Nature; it is essentially a practical philosophy. Dialectical materialism is an instrument for the study and transformation of everything that exists. It involves practical revolutionary action. (90)
Criticism of Feuerbach:

It is often said that Marxism draws its Dialectic from Hegel and its materialism from Feuerbach. Just as we cannot say that the Dialectic of Hegel is identical with that of the Marxists, neither can we say that the materialism of Feuerbach was incorporated without change. What fundamentally separates Marx from Feuerbach is his historical approach and his concrete analysis of those factors of social life which appear in Feuerbach only as abstractions. (91)

Though Feuerbach was well acquainted with the Dialectical method and used its principles, he did not apply it sufficiently in the case of man. Feuerbach had simply repudiated Hegel, without trying to see what was valid in the Dialectic when applied to society.

Marx saw that in fighting the speculative philosophy of Hegel, they could not ignore his method, for it was the perfect instrument for their own materialistic philosophy. And the value of the Dialectic was recognized in the early period of the development of Marxism. (92)

The Hegelian method was merely out of place --- it had to be "stood upon its feet" so that it could see the world as the reality which it is, rather than the distorted image it appeared to be in Hegelian logic, where the "Dialectic was standing on its head". (93)

What distinguished Hegel's mode of thought from that of all other philosophers was the enormous historical sense upon which it was based. Abstract and idealistic thought it was in form, yet the development of his thoughts always proceeded in
line with the development of world history and the latter was really meant to be only the test of the former. If, thereby, the real relation was inverted and put on its head, nevertheless its real content entered everywhere into the philosophy: all the more so since Hegel, in contrast to his disciples, did not parade ignorance, but was one of the finest intellects of all time. He was the first who attempted to show an evolution, and inner coherence in history; and while today much in his philosophy of History may seem peculiar to us, yet the grandeur of the basis of his basic outlook is admirable even today, whether one makes comparison with his predecessors, or with anyone who, since his time has taken the liberty of reflecting in general concerning history. This epoch making conception of history was the direct theoretical prerequisite for the new materialist outlook, and thereby provided a connecting point for the logical method. (94)

The step Feuerbach did not take, the dynamic conception of man, Marx did take, as early as 1845 in The Holy Family. For man lives not only in Nature but also in human society, and this no less than nature has its history of development and its science. It was question of *bring-*ing history into harmony with the materialistic foundation and of reconstructing it thereupon. He remained bound to the "metaphysical", or abstract notion of man.

Like the French materialists, Feuerbach taught that man was the product of circumstances and education, the product of existence acting upon consciousness. Thus man was considered as a part of nature formed mechanically by the action and influence of Nature around him. All his thoughts, his reactions were products of Nature. According to Feuerbach it seemed that man was purely a passive element, an obedient recipient of impulses supplied by Nature.

To this passivity Marx objected. Everything
that goes on within man, the changes of man himself, are the effects
not only of the influence of nature upon man, but even more so of the
reaction of man upon Nature. It is this that constitutes the evolution
of man. Man reacted upon Nature and changed it, and in changing Nature
he changed himself. (95)

Thus Marx introduced a revolutionary, active
element into Feuerbach's passive materialism. It is the work of
philosophy not only to explain the world, but to change it. Action
is superior to contemplation, for contemplation by itself is sterile.

The principal defect of past materialism (including that of
Feuerbach) is that the opposition, the reality, the matter itself
are considered under the form of object or intuition, and not as
an activity of man himself. As praxis and not as subjectivity.
That is why the activity is developed abstractly by idealism,
in opposition to materialism, for idealism does not know real,
sensible activity as such. Feuerbach wants to consider sensible
objects as really distinct from thought; but he does not
consider human activity itself as an objective activity.
(Thesis I on Feuerbach, Marx)

Philosophers have only interpreted the world in different ways;
what remains is to change it.
(Thesis XI on Feuerbach) (96)

The differences between the materialism of
Feuerbach and that of Marx lie more within the field of social philosophy,
than in the philosophy of nature, we shall not insist too strongly
upon this difference. We can say that Marxism took its element of
materialism from Feuerbach, for it was he who inverted the order of the
Hegelian logic: he held that being determines thought, and not vice
versa. With proper qualifications this is not contrary to the principle of Marx, that "man determines nature", for Marx himself insists on the priority of the object over the thought of the object; and the human activity of which Marx says Feuerbach considered in an abstract way is truly an objective activity. In fact, Marx merely went further than Feuerbach, and applied the fundamental principle of materialism to a field that Feuerbach's spirit of traditionalism would not let him enter — the field of historical materialism. "Backwards I agree with the materialists; but not forwards", was his way of stating his conservatism. (97)

The Dialectic of Nature: Karl Marx's contribution:

The Marxists considered the Dialectic of Hegel to be the one method that gave a most consistent explanation of the development of matter. Every other formulation up to this had been a non-sided, abstract view, lacking vitality, whereas matter in its real condition of existence was a moving force that could not be captured in abstract ideas. Though they professed to be outright materialists, the followers of the French classical school were abortive materialists, for they recognized matter only as a material cause. Matter is, however, completely sufficient to explain all becoming in the world, and so it possesses an intrinsic dynamism that makes it independent of all other motive forces. Substitute matter for the Being
of Hegel and you have the perfect formulation of dynamic materialism.

Though all the Marxists hold to the principle that matter is the only reality in the universe — that so-called "spirit", or mind is but matter in its highest state of development — nevertheless there is a qualitative difference between matter in its conscious state and matter in its condition of Nature apart from man. Can the Dialectic apply indifferently to these different states of matter? or does Dialectic apply in its strict sense only to man and human society, and metaphorically to the rest of Nature?

Sidney Hook raises the objection — and it is a valid one — firstly, that a Dialectic of Nature is impossible, and secondly then Karl Marx himself never taught a Dialectic of Nature, but only a Dialectic of Society, or of Man. The first part of this objection, which we also shall make, is considered in the analysis, in the latter part of this dissertation, of the Dialectic of Nature. Whether Marx himself held that Dialectic can be applied to Nature apart from man is by no means clear. There is evidence for and against this position.

In support of the opinion of the Marxists in general, that Karl Marx really did teach the application of Dialectical principles to non-conscious matter, we have the fact that in all their writing and in all their work, Engels and Marx were always in closest communication. And Engels certainly taught a Dialectic of Nature, as
withnessed by the Anti-Dühring, the Ludwig Feuerbach, and the book bearing the very name, Dialectics of Nature. Each of them not only read the other's manuscripts, but collaborated by means of suggestions and criticism in the very writing. There could hardly have been two men more close to each other, two men who understood each other as well as Marx and Engels --- the frequent visits and the enormous correspondence that passed between them, the mutual reliance one on the other, make it almost impossible to believe that Marx disagreed with Engel on the question of Dialectics of Nature. For Marx was no man to let personal feeling keep him from criticizing a part of the theory upon which the workers revolution was to be built, if that theory was recognized as false and potentially injurious to the cause.

Another bit of evidence in support of this opinion, is the unity of the Marxist doctrine. If Marxist materialism is a complete world outlook different from materialistic outlooks up to their time, then the Dialectic must run through its doctrine of Nature as well as through their teaching on society and history. Otherwise their philosophy of nature would not differ from that of the French materialistic school --- it is the dynamism of matter in the Marxist theory that sets it apart from the classical notion of matter, and this dynamism is nothing other than the Dialectic of Nature. Matter, according to a fundamental principle of Marxism, is in a constant development,
and man is but the highest state of this development. When Marx commended Descartes for speaking of matter as having a vital principle within itself, ("had invested matter with self-creative power and had conceived of mechanical motion as its vital act") (98), he was evidently speaking of non-conscious matter.

In the writings of Marx there is evidence that he held the validity of the Dialectical laws when applied to unconscious Nature. The Anti-Dühring whose first part is an exposition of the Dialectics of Nature is the joint work of Marx and Engels. And in several letters Marx says that there is at least a verification in nature of the Hegelian laws of Dialectic.

During the past four weeks I have read all sorts of things. Among others Darwin's work on Natural Selection. And though it is written in the crude English style, this is the book which contains the basis in natural science for our own view. (99)

Darwin's volume is very important and provides me with the basis in natural science for class struggle in history. (100)

You will see from the conclusion of my third chapter that in the text I regard the law Hegel discovered as holding good both in history and in natural science. (101)

In a footnote in the Ludwig Feuerbach Engels says of the part Marx had in the formation of dialectical materialism:

Here I may be permitted to make a personal explanation. Lately repeated reference has been made to my share in this theory (dialectical materialism), and so I can hardly avoid saying a few words here to settle this particular point. I cannot deny that both before and during my forty years' collaboration with
Marx had a certain independent share in laying the formulations, and more particularly in elaborating the theory. But the great part of its leading basic principles, particularly in the realm of economics and history, and above all, its final, clear formulation, belong to Marx. (102)

In the Anti-Duhring Engels says:

Une remarque en passant : la conception exposée dans ce livre ayant, pour la part de beaucoup la plus grande, été fondée et développée par Marx, et pour la moindre part seulement par moi, il allait de soi que je n'écrivisse pas cet exposé à son insu. Je lui ai lu pour le deuxième chapitre de la partie consacrée à l'économie politique (sur l'histoire critique) il fut écrit par Marx ; malheureusement je dus l'abréger un peu pour des raisons extrinsèques. C'était d'ailleurs de tout temps notre habitude de nous aider mutuellement dans des domaines que nous possédons spécialement. (103)

The last two quotations probably give us as accurate an indication as is possible to have on the problem. Marx and Engels were each specialists in a certain part of dialectical materialism. Marx concentrated on the economic and sociological and historical side, while Engels took the side of non-conscious Nature. Marx's writings are theoretical, it is true, but always have the practical aspect of immediate reference to the class struggle. Engels busied himself with mathematics and the experimental sciences, with the ideal of finding in nature a verification of the Dialectical laws. Except for the few references we have given, Marx never speaks of Dialectics of Nature.

We are inclined to agree, therefore, with Sidney Hook when he says that Marx did not teach a Dialectic of Nature. (104)
The few references we have given are not sufficient to constitute a doctrine, at least, a formulation of the doctrine. Most probably Marx was not especially interested in it, for there were more burning questions, more suited to his capacity as a polemical writer and economist, to take up his time. This part he left to his friend Engels. That Marx personally held the same law of Dialectic apply both in Nature and in society, we think there is sufficient evidence to assert, but this doctrine is not held with that full conviction that comes from having worked out and thought out the problem for himself --- it was more a belief based on the conviction of his collaborator.

Whatever be Marx's position, there can be no doubt that Frederich Engels and all Marxists who follow him (Plekanov, Lenin, Adoratsky, Stalin, as well as the lesser theorists) have taught and do teach a Dialectic of Nature. The dialectical movement of matter through conflict is a fundamental tenet that gives a rational explanation for their philosophy of man. For example: it rationalizes their doctrine of violent revolution; their fight against religion and their profession of atheism; their struggle for supremacy in the technical sciences.

A doctrine which makes matter the sole reality and gives it an intrinsic principle of movement through conflict, leads to these conclusions of Marxism. Marxists, in general, look upon Historical materialism as the application in a higher field of those basic principles that govern all matter.
The laws of dialectics:

While in London in 1871 Engels started reading scientific books and journals on a large scale (he had long ago formed his interest along mathematical and scientific lines), with the intention of writing a great book "to show that in nature the same dialectical laws of movement are carried out in the confusion of its countless changes, as also govern the apparent contingency of events in history." Engels never completed this work. After Marx's death in 1883 he had the gigantic task of editing and completing Das Kapital, during which time he also wrote Ludwig Feuerbach and The Origin of the Family. The Manuscript of the Dialectics of Nature consisting of four bundles of notes all in Engel's handwriting, save for a number of quotations from the Greek philosophers in that of Marx, remained unedited until recently. An English translation was made by Clemens Dutt in 1940, and this was published by International Publishers, New York. Most of the manuscript seems to have been written between 1872 and 1882, and therefore the science will have the limitations of the science of that period. In addition to this book, the Anti-Duhring, part I, and the Ludwig Feuerbach, are the best source books available for the Dialectic of Nature. The Marxists who followed added very little either to the doctrine or to the examples of Engels, with Lenin making a few new applications of the dialectical laws to more modern science. It was Lenin, however, who really developed Marxist epistemology --- the Empiric-Criticism is a
complete exposition of Marxist doctrine of knowledge. After Lenin little progress in any way whatsoever was made, though the applications of the basic principles of Marxism have been varied to fit the needs of the times.

Engels considered the dialectical laws to be applicable to every field of knowledge, applicable to the objects known as well as the processes by which they are known. "The dialectic is nothing more than the science of the general laws of motion and development of nature, human society, and thought". The Dialectic is a constitutive principle in everything, a pervasive ontological character of everything that is or can be.

The laws of Dialectic, which in the philosophy of Hegel had been used to construct a logical world, must be turned right side up and applied to the real world, from which they had originally been drawn, though Hegel himself was unaware of it. These laws are valid because they have been drawn from the real world of movement; they are not the subjective construction of Hegel or of anyone else. Hegel had drawn many examples of Dialectic from the world of Nature, as well as from the science of mathematics and history, but he reversed the right order when he said that the dialectical laws were confirmed by these examples, instead of saying that these examples were the sources according to which the laws were formulated. Hegel’s mistake lay in the fact that he considered the universe only as a product of
a definite stage of evolution in human thought, instead of being the reality which measures thought. Once this perverted order is corrected the dialectical laws that look so mysterious in the idealistic philosophy "at once become simple and clear as noonday". (105)

Modern experimental science has contributed to urge a new dialectical view of nature. Until the end of the 18th century or early part of the 19th, natural scientists could manage pretty well with the old abstract view of nature, because science had not progressed much beyond mechanics. High as the natural science of this period stood above the experimental science of the Greeks, it was inferior to the general philosophical view of the Greeks, who had already looked at Nature as a dialectical movement. (106) The science of the eighteenth century, which was the outgrowth of the mechanistic philosophy of Descartes, looked on the universe as a giant machine that never varied in its motion, because all the parts of it were bound by the immutable laws of mechanical motion. This mathematical view of the world did aid in the solution of many problems of physics, and it was "satisfying" --- because it gave the mind a feeling of certitude and immutability that is characteristic of mathematical sciences. But progress in the experimental sciences themselves showed that this was a false view of the world, for the world was really Heraclitean in character.

It was necessary to return to the point of view
of the great founders of Greek philosophy, to the view that the whole of nature, from the smallest element to the greatest, had its existence in eternal coming into being and passing away, in ceaseless flux, in unresting motion and change. (107) For the Greeks this was but a brilliant intuition; for modern science it was the result of strict scientific research.

Thanks to the three great discoveries (108) and the other immense advances in natural science, we have now arrived at the point where we can demonstrate as a whole the inter-connection between the processes in nature not only in particular spheres but also in the inter-connection of these particular spheres themselves, and so can present in an approximately systematic form a comprehensive view of the inter-connection in nature by means of the facts provided by empirical natural science itself. To furnish this comprehensive view was formerly the task of so-called natural philosophy. It could do this only by putting in place of the real but as yet unknown inter-connection ideal and imaginary ones, filling out the missing facts by figments of the mind and bridging the actual gaps merely in imagination... Today, when one needs to comprehend the results of natural scientific investigation only dialectically, that is, in the sense of their own inter-connections in order to arrive at a "system of nature" sufficient for our time; when the dialectical character of this inter-connection is forcing itself against their will even into the metaphysically trained minds of the natural scientists, today this natural philosophy is finally disposed of. (109)

When we study nature in its objectivity as a real existing thing and not merely as an abstraction, when we make an introspection of our own character, when we consider history not in its isolated units but as a wave motion, we are struck, says Engels, by the infinity of actions and reactions that are found in each of them --- everything is in a continual state of flux: of development, of degeneration, of resurgence. The philosopher Heraclitus had already
known this unstable nature of everything in the world, but his general view did not permit us to grasp what was taking place in the individual parts that make up the universe. Now it is the duty of particular sciences to study these phenomena in detail. Up until the nineteenth century the method of study consisted in cutting up the phenomena into parts and then studying each part --- this was the method of abstract, metaphysical thinking. Through this method of analysis the phenomenon was classified according to certain forms that corresponded to the various divisions that had been made. This method had the disadvantage of separating the being from its environment, as well as cutting off the interaction of the parts of the being one on the other. Thus, the abstractive knowledge of reality took the being outside its real condition of existence, and thereby gave us a knowledge that was only partially correct. Phenomena that are essentially mobile can be correctly viewed only in their condition of mobility.

This first method of studying reality is called "metaphysical" or abstract, and the logic according to which it governs its concepts is called "formal" logic. The second method of study is "dialectical", and the logic according to which it governs its concepts is "Hegelian" or "concrete" logic. Needless to say, the latter is superior to the former, because it captures the being in its real, concrete existence --- Nature exists dialectically, not metaphysically. (110) So argues Engels:
Pour la dialectique...qui embrasse les choses et leurs copies dans l'intellect essentiellement dans leurs relations, leur enchaînement, leur mouvement, leur naissance et leur fin, des phénomènes tels que ceux que nous avons décrits sont autant de confirmations de la méthode expérimentale qui lui est propre. La nature est la pierre d'essai de la dialectique, et il faut dire que les sciences modernes de la nature ont fourni pour cet essai des matériaux extrêmement riches et dont la masse augmente tous les jours, et qu'elles ont ainsi prouvé qu'en dernière instance la nature procède dialectiquement et non métaphysiquement. (ill)

The basic laws of Nature are the same as the dialectical laws formulated in the Hegelian logic. The formulation varies among various Marxist writers, especially in regard to the Law of identity of opposites. And the order of the laws does not remain constant, so that we put down as the first law may be taken as the second law, and so on. We have followed what seems to us the logical order, the order of precedence of these laws.

These are the three laws: 1) The law of identity of contradictories. Sometimes alternate phrasings are found, such as: Law of identity of opposites; law of unity of opposites; law of unity of contradictories. 2) The law of negation of the negation. Sometimes this is called the law of the transformation of contradictions into each other. 3) The law of the transition of quantity into quality.

**Law I : Identity of Opposites**

The fundamental presupposition of all the laws
of dialectics is the belief that contradiction is objectively present in all things and processes. According to traditional usage contradiction has been limited to propositions or judgements, and has not been considered applicable to things and events. In arguing against Dühring Engels tries to show that this has been the limitation of philosophy up to Hegel (making exception for the ancient Greeks who taught a dialectic of Nature), and the superiority of modern philosophy is precisely in making the contradictions objective.

The law of the identity of opposites is the recognition of the contradictory, mutually exclusive, opposite tendencies in all phenomena and processes of nature (as well as in society and in knowledge). (112)

It is true that as long as we consider things in a state of rest, or in a condition of abstraction, we do not meet with any intrinsic contradiction. We find in such a being certain properties, some of which are common with other beings, and some of which are peculiar to this individual. Considered independently, none of these properties is contradictory, for each of the properties is considered in an abstract condition where the mind attributes only one concept to each part. But it is entirely different if we consider the thing in its actual state of existence, in its relationship to other things and in the relationship of parts to each other. There we enter into a field where contradiction is the law.
The basis for this universal contradiction in Nature is the condition of instability or movement that all things in Nature is subject to. Movement itself is a contradiction, as the simple movement of local motion shows: for local motion is possible only because a body is in a certain place and is not in that place, (for it is in another place at the same time)(113) You cannot give a definitive answer to the question: Is a body which is in movement in this place or is it not? You must answer yes and no.

Motion according to the Marxists cannot be expressed except by resorting to contradictory statements. This is evidence that motion itself is contradictory. The conclusion of Zeno was that there could be no motion — the conclusion of Engels is that there is motion, and it is contradictory. (114)

Local motion is but one example of movement in Nature. There are other kinds of movement. Now it is the nature of matter which is at the base of all these different kinds of movement—local motion, transmutation of energy, degeneration, and so on. All these illustrations but bring out the fundamental character of matter. Matter is self-contradictory, and therefore it is in constant motion. Though these forms of motion may have qualitative differences, they are all the same reality, matter, and therefore have ultimately the explanation of their movement in that which they basically are. Thus in the place of the idealistic "demiurgos" of Hegel, the Idea, we have a
"demiurgos" (if we want to speak of one) intrinsic to matter and it is this which is the driving force of all movement.

If a simple change like mechanical motion already evidences the presence of contradiction, how much more so does a higher form of movement of matter, like organic life. Life is a contradiction that continually resolves itself, and when the contradiction ceases, life ceases.

Engels conceives of the contradiction as really a struggle, in the sense that there is a struggle between opposing armies in a war, or as there is a struggle between the privileged and underprivileged class. This is not mere metaphor, for neither Marx nor Engels were given to the use of metaphor when they were laying the foundations for action. The fact that each part in this struggle has not yet reached the condition of consciousness and therefore act part enters the struggle blindly and of necessity, does not take away the real element of conflict. Matter in its lower states just as in its higher states is intrinsically contradictory, and consequently in constant
state of mobility. (116)

Matter moves in an eternal cycle completing its trajectory in a period so vast that in comparison with it our earthly year is as nothing. It moves in a cycle which has as the crowning point of its condition of organic life, what is called "self-consciousness". Thus mind is but the highest condition of the eternal movement of matter. In this eternal cycle every particular form of the existence of matter is verified --- be it the sun or a nebula, a particular animal or animal species, a chemical combination or decomposition ---. However long this cycle make take, and however many forms it may go through, we are certain that one thing will remain constant, and that is the Nature of matter. (117)

Another example of contradiction in the universe, and this runs through the whole universe, is the identification of chance and necessity. It seems that there cannot be anything more contradictory than these two, and it is the common sense judgement as well as that of metaphysical thinkers, that these two mutually exclude each other. In order to reduce all phenomena to necessity and thus make science possible, as they thought, the French materialists reduced all to absolute mechanical necessity. Every effect, they taught, can be reduced to its proper causes. That a peapod contains only five peas and that a dog's tail is five inches long and not a fraction of an inch longer, that a particular clover flower is fertilized by a particular
bee are all facts that can, according to the science based on mechanistic materialism, be produced only by an unchangeable concatenation of causes and effects.

This kind of necessity does not exist in the universe, Engels asserts. The reason there is only chance here, he says, is that it is absolutely impossible to retrace the causes that have led up to such an effect.

There is no question of tracing the chain of causation in any of these cases; so we are just as wise in one as in another, the so-called necessity remains an empty phrase and with it --- chance also remains what it was before. As long as we are not able to show on what the number of peas in the pod depends, it remains just a matter of chance, and the assertion that the case was foreseen already in the primordial constitution of the solar system does not get us a step further....A science which sets itself the task of following back the casus (sic) of this individual peapod in its causal concatenation would no longer be science but pure trifling; for this same peapod alond has in addition innumerable other individual, accidental-seeming qualities: shade of colour, thickness, hardness of the pod, size of the peas, not to speak of the individual peculiarities revealed by the microscope. The one peapod, therefore, would already provide more causal connections for following up than all the botanists in the world could solve. (118)

Determination and chance are present simultaneously in the universe. Matter moves inexorably onward and upward according to firm and fixed laws, yet there is in each particular movement an element of chance. The very necessity which drives matter through its various forms is a blind necessity, for there is no such thing as finality or purpose in Nature --- since this latter would
entail either the existence of consciousness in all things in Nature, or the existence of some Mind apart from the world directing the movement of the universe towards some end.

This was the position, also, of Democritus, who taught that the movement of atoms, which resulted in diversity in the phenomenal world, was due to the universal law of gravity which affected the atoms according to their mass (making according to the opinion of that time the heavy atoms fall faster, and the lighter atoms more slowly). The various combinations of atoms that resulted from the vortex motion of atoms striking each other is due to their haphazard collisions with each other.

The laws of Nature are both objective and absolute, and to this extent the whole universe is subject to determination. Yet the individual phenomena which come about through the exercise of these laws can, as we have seen in a previous quotation from Engels, be attributed to chance, since it is utterly impossible to trace all the causal lines of even the tiniest reality in Nature.

The general laws of motion --- both of the external world and of human thought --- (are) two sets of laws which are identical in substance but differ in their expression in so far as the human mind can apply them consciously, while in nature and also up to now for the most part in human history, these laws assert themselves unconsciously in the form of external necessity in the midst of an endless series of seeming accidents. (119)

When this same conflict between chance and
determination is found in its highest state of development, we have the identification of freedom and necessity. Free will and necessity, though they as concepts are absolutely separate, are identified in the concrete human being. Freedom of will is nothing more than knowledge of the necessity of Nature. Consequently the more a man knows he is determined by necessity to do something, the more he can be said to be free. "For until we know a law of nature, which exists and acts independently outside our mind, we are the slaves of "blind necessity". But once we come to know this law, which acts (as Marx pointed out a thousand times) independently of our will and our mind, we become the lords of nature". (86)

Hegel was the first to state correctly this relation between freedom and necessity. To him, freedom is the appreciation of necessity. 'Necessity is blind only in so far as it is not understood.' Freedom does not consist in the dream of independence of natural laws, but in the knowledge of these laws, and in the possibility this gives of systematically making them work, towards definite ends. This holds good in relation both to the laws of external nature and to those which govern the bodily and mental existence of men themselves --- two classes of laws which we can separate from each other at most only in thought but not in reality. Freedom of the will therefore means nothing but the capacity to make decisions with real knowledge of the subject. Therefore the freer a man's judgment is in relation to a definite question, with so much the greater necessity is the content of this judgment determined... Freedom therefore consists in the control over ourselves and over external nature which is founded on knowledge of natural necessity. (120)

Modern Marxist theorists have added some examples of the law of identity of opposites, examples that have been brought to light through the progression of science. These include
examples from further progress in physics, especially along the lines of the nature of electricity, and the construction of the atom. These phenomena are definitely dialectical, they say. And in physiology, the old example of Engels, the dialectical character of the sexes, has been explained more in detail to give a rational basis to certain laws of characteristics. Freud has shown that we can have no feeling of love towards anyone without simultaneously have a more or less suppressed feeling of hatred for the same person, and vice versa, and so, the Marxists find another verification of the universal law of identity of opposites.

This identity, it was already pointed out, does not exist in abstract concepts, but in the concrete. Abstract concepts are contradictory and always remain so, but these concepts give us only an imperfect knowledge of the real, for the intellectual process which abstracts these "ideas" is at the same time separating the real object into parts that cannot be separated in the real. For abstract concepts the Aristotelian logic is sufficient. When it is question of distinguishing these thoughts we can apply the rule: Yes is yes; and no is no. This law is useful up to a certain degree, since science needs it for classification, and we need it in the ordinary activities of daily life, where we base our actions on relative truth rather than on the truth of the object as it is in itself. (121) Thus, a car is red though its color is fading, because that is the
color it was when it was bought, and there is no point in describing
the exact shade of color between red and brown that is now on the car.
Or we may say a person is not bald because he has more hair than an
uncle who has no hair on the top of his head. Just when to call him
bald or not bald is a practical question. Objectively the opposites
are united, for a person who is going bald is both. (122)

But when we consider an object in movement we
can no longer apply the rule of Aristotelian logic, for in a being in
movement contradictories are united. And the principle of the logic
now to be applied is: Yes is no; and no is yes. Matter in movement
is a contradiction, and the truth of the fact can be expressed only
in a logic that admits the simultaneous presence of contradictory
elements.

Real matter and real movement (consequently)
are present only in Nature. It is the science of Nature, therefore,
that will primarily be interested in the laws of dialectics and in
the new logic that governs our thoughts of movement. But modern
mathematics, too, has seen the necessity of a dialectical viewpoint.
Mathematical objects as such do not, of course, exist in the world of
reality as mathematical. There all that exists is a real being
independent of our mind's conceiving it or not. Mathematics is a
science that rests within the limits of our mind in so far as all the
computations are concerned, and it has only a practical application to the world of Nature. A kind of movement in mathematics is admitted by the Marxists, together with all modern mathematicians, and to that extent the dialectical laws have reference to this science as well as to the science of Nature. Our primary interest is the Dialectics of Nature, and, so, we shall limit ourselves to that consideration in the text. In the appendix we give a summary of the Marxist doctrine of dialectics applied to mathematics. (123)

Consequences of the first law:

The first law of matter, the law of opposites, obviously has one important consequence: it established the autodynamic character of matter and dispenses with the need of an Cause external to matter itself to account for the motion evident in the world. It implication is that since matter possesses its own immanent principle of activity, no Mover extrinsic to the universe is needed —- a limitation of classical materialism. (124)

Throughout the universe, development proceeds not as the result of any external cause (God), not because of any "purpose" inherent in events, but because of the inherent contradictions that are contained in all things and in all phenomena. "Contradiction is the root of all motion and of all life", Hegel wrote. "It is only because a thing contains a contradiction within itself, that is moves and acquires impulse and activity. This is the process of all motion and all development. (125)
The second and third laws of Marxist Dialectic are virtually contained in the first, since they are but determinations of the movement that is set up in the first law through the conflict of opposites. These last two laws define more specifically the direction of the movement of matter.

The law of negation of negation affirms that the negation, which started the movement of matter through the conflict that it caused, is itself negated in the synthesis. The synthesis is something positive. It is a return to the original thesis that was negated by the presence in the one and same real being of the contradictory of that which was first affirmed. For example, through the law of negation of negation, life which would be negated by its contradictory, death, would return again in the synthesis, for death itself would be negated in the movement. Thus, it could be generally stated that any progress can come only by way of negation. This principle is at the basis of Marxist doctrine of revolution --- there cannot be real progress except by overthrowing the existing condition. In the social order the Communist does not want merely an improvement of an imperfect situation; he wants the overthrow of the whole thing, for only in that way can any thing permanent be gained. As Marx himself affirmed many times, he did not want social legislation in Germany at a time when the communist
party looked forward to the rise of their social system there, for
the reason that workers would become satisfied with their lot and
no longer desire revolution. The capitalist state must be overthrown,
not merely corrected. (126)

Through the negation of the negation the
synthesis does not result only in a summation of the qualities of the
two contradictories. The positive character that was negated returns
on a higher level. The original qualities are enhanced. Compromise,
which is but the union of the contradictory elements is an obstacle to
the movement of matter, for it does not allow for real progress. With­
out negation there is no progress, no development.

The first law, the unity of opposites,
represented the general relations of things from the point of view of
structure; the second law represents the relation of things as a process,
that is, dynamically. These two laws of nature permeate each other;
they form a coherent whole: the first gives a cross section of the
world, while the second gives a longitudinal section. The second law
is just as extensive as the first law, and therefore, applies to every­
thing that is found within the limits of the law of opposition.

Qu'est-ce donc que la négation de la négation ? Une loi du
développement de la nature, de l'histoire et de la pensée,
extrêmement générale, et, pour cette raison même, ayant l'ex­
tension et la portée les plus grandes; loi qui, nous l'avons
vu, trouve son application dans le règne animal et végétal;
en géologie en mathématiques, en histoire, en philosophie, loi
à laquelle M. Dühring lui-même est bien obligé d'obéir à sa manière, sans le savoir, tout en se rebiffant recalcitrant. (127)

One example of the negation of the negation is the increase realized through planting seeds. The seeds are put in the ground under favorable conditions; they underdo a change in their form (this is the negation). But the result of this is the birth of plants in which the seeds are found once again in their original state (negation of the negation), but in great increase. Another example in the animal kingdom is the butterfly. It comes originally from an egg (which is changed as an egg); after the butterfly grows to sexual maturity, when the female lays a great number of eggs. Thus there is a return to the original, but with increase. Geology points out a series of negations of negations as each succeeding formation destroys the former to see it increased in the new. (128)

Neither the original negation, nor the negation of this can take place in a haphazard way, but must take place in each instance according to the nature of the thing that is in movement. Some negations result only in destruction, and not in progress. There must not only be a negation, but also a lifting up (aufheben) through a negation of the negation. The first must be such that the second negation can take place. A grain of barley is not going to reproduce if we destroy it by boiling it; nor is an insect going to reproduce
itself if we negate it by stepping on it. Each class has its own natural way of negation, and it is only experience that can teach us what this negation is. (129)

Not only in nature but also in society the nature of the thing negated must be taken into consideration. There must not be utter destruction that in no way provides the possibility of new growth. And just as in nature experience shows us how this negation is to take place, so in society, the negation must take place along the lines of the natural movement of society. Experience and observation will determine the way in which negation is to take place.

The most important implication of the second law of Dialectics of Nature is that the principle of fecundity in matter is negation (or that which it comes down to, privation). Negation offers an explanation for the development of nature and society, so that the existence of an Intelligence transcendent to matter is in no way required. This is another step towards the complete rationalization of the Marxists' positive materialism.
III Law of Marxist Dialectics:

Transformation of quantity into quality.

The third and final law of matter is the law of transformation of quantity into quality. With this the dialectical explanation is complete, for this provides for the emergence of new forms in the universe. According to the first law matter, which exists eternally, is a composite of contradictory elements. Contradiction is necessarily productive of motion, and thus matter is, by its very nature, autodynamic. The second law accounts for the quantitative development of reality, for in the world of reality everything tends towards its own negation in such a way that there will necessarily result a quantitative increase in that which is negated. Finally, the third law of transformation accounts for the emergence of all new realities in the world.

According to this law matter develops quantitatively up to a certain point (called a nodal point in Hegelian terminology) where a sudden break takes place, and a new form qualitatively different from the old comes into being. Contrary to the "metaphysical" outlook, dialectics does not regard the process of development as a simple process of growth, where quantitative changes do not lead to qualitative changes, but as a development which passes from insignificant and imperceptible quantitative changes to open, fundamental changes, to qualitative changes. The qualitative
changes take the form of a "leap" from one state to another.

Marxists insist on the difference between gradual evolution and revolution. Marxist dialectics does not neglect gradual change --- this is accounted for in the second law --- but dialectic must be able to explain the arising of new realities. Without the sudden "leap" it would be necessary to assume that nothing new can arise, since everything already exists in an imperceptibly minute form, capable of subsequent growth. The principle of the old philosophy and of mechanistic materialism was: *natura non facit saltus*. Their emphasis on this law is just another bit of evidence of their sterile way of thinking. This was a principle which they had worked out in their "armchair philosophy" --- they did not observe reality, for if they had, they would have seem examples of sudden breaks all around them.

Nature is the test of dialectics, and it must be said for modern natural science that it has furnished extremely rich and daily increasing material for this test, and has thus proved that in the last analysis nature's process is dialectical and not metaphysical, that it does not move in an eternally uniform and constantly repeated circle, but passes through a real history. Here prime mention should be made of Darwin, who dealt a severe blow to the metaphysical conception of nature by proving that the organic world of today, plants and animals, and consequently man too, is all a product of a process of development that has been in progress for millions of years. (130)

But to quiet any suspicion that Engels taught a gradual development of various new species in nature, in his criticism
of Dühring, who had opposed the thesis that the transition from the insentient world to the sentient world, from inorganic matter to organic life is a new leap, Engels says:

This precisely the Hegelian nodal line of measure relations, in which, at certain definite nodal points, the purely quantitative increase or decrease gives rise to a qualitative leap; for example, in the case of water which is heated or cooled, where boiling-point and freezing-point are nodes at which --- under normal pressure --- the leap to a new aggregate state takes place, and where consequently quantity is transformed into quality. (131)

Here, as elsewhere, most of the examples of the Marxists are taken from the writings of Hegel. It was he who formulated the expression "nodal point", to determine the point beyond which a thing cannot vary while remaining the same thing. It was Hegel who first insisted on the difference between dialectical progression and simple evolution. (132)

The most important example of the law of transformation of quantity into quality is the coming into existence of conscious matter --- man. The existence of mind is simply due to a leap which occurred in organic matter after it had evolved to a high degree of organization.

The physical realm existed before the psychical, for the latter is the highest product of the most highly developed forms of organic matter. (133)

And from the first animals were developed, essentially by further differentiation, the numerous classes, orders, families, genera and species of animals; and finally
mammals, the form in which the nervous system attains its fullest development; and among these again finally that mammal in which nature attains consciousness of itself --- man. (134)

The philosophy of Hegel is veritably an "algebra of revolution", but Hegel did not apply his philosophy to the burning questions of the day. Hegel was a conservative in his political views --- as Marx says, he "set an aureola on the existing state of affairs". He became the philosopher of the bourgeoisie German government because he was an optimist at the expense of one of the laws of dialectics which he himself had formulated. He overlooked the intrinsic defects of that government, defects which he should have known would bring about the negation, the destruction, of that political system. The social revolution was coming and a new state would succeed the old one which would pass away through revolution.

At a certain stage of their development, the material forces of production in society come in conflict with the existing relations of production, or --- what is but a legal expression for the same thing --- with the property relations within which they have been at work before. From forms of development of the forces of production these relations turn into their fetters. Then begins the epoch of social revolution. With the change of the economic foundation the entire immense superstructure is more or less rapidly transformed.... In broad outlines we can designate the Asiatic, the ancient, the feudal, and the modern bourgeois modes of production as to many epochs in the progress of the economic formation of society. The bourgeois relations of production are the last antagonistic form of the social process of production --- antagonistic not in the sense of individual antagonism, but
of one arising from the social conditions of life of the individuals; at the same time the productive forces developing in the womb of bourgeois society create the material conditions for the solution of that antagonism. This social formation constitutes, therefore, the closing chapter of the prehistoric stage of human society. (135)

With the last of the three laws of dialectics we have the complete rationalization of the Marxist philosophy of revolution. As we said in the Preface, we do not think that this philosophical rationalization is foremost in the minds of Marxists. Primarily they are men of action —- they want social revolution —- and theory is but an instrument that will help them reach their purpose. They are not interested in the dialectical laws of nature because these laws give them a better knowledge of nature. The purpose of modern philosophy is "not so much to know nature, but to change it". The dialectical laws of nature will help them change nature, by showing the naturalness and necessity of such a change.

The same laws of motion govern society. This the abstract philosophers failed to see, and this, though he recognized the dialectical character of society in general, Hegel failed to realize in the practical order. Here, just as in the realm of nature, it was necessary to do away with the artificial, fabricated interconnections of society, in order to discover the real ones : a task which ultimately amounts to a frank admission of the inexorable laws of change that bind all matter, whether in its
lowest state or in its highest condition of consciousness.

In one point, however, the history of the development of society proves to be essentially different from that of nature. In nature — in so far as we ignore man's reactions upon nature — there are only blind unconscious agencies acting upon one another. There is no such thing as purpose in nature, for this would presuppose an Intelligence apart from matter directing matter towards particular ends — or we would have to admit a consciousness in nature, a thing which is impossible. Nothing of all that happens, whether in the innumerable apparent accidents observable upon the surface of things, or in the ultimate results which confirm the regularity underlying accidents, is attained as a consciously desired aim. In the history of society, however, the conflicting elements are endowed with consciousness, for men act with deliberation, acting and working for definite goals. It is this element which sets men off from the rest of nature. (136)

With men we enter history. The more that human beings are removed from the conditions of unconscious nature, the less do uncontrolled forces and unforeseen agents determine what man and nature are to be, and the more does the historical result correspond to the aim laid down by man in advance. Through the development of science and the means of production man gradually attains this mastery over the blind forces of nature. The forces of
nature must be pressed into service for the good of mankind. This is what is meant by "man changing nature". And anyone who studies the Communistic movement in Soviet Russia will see that their emphasis on technical development has the purpose of making the "liberated" man the absolute ruler of the universe. With this in mind, he will also be better able to understand the Soviet's sensitiveness in the face of criticism of their economic system and technical progress — a good of example of this was their violent rebuttal of William L. White's article in Readers Digest of December 1944 and January 1945, "Report on the Russians".

The free will of man changes the course of history, but this must not be understood to mean that men's wills act independently of the circumstances in which they are placed, or independently of the wills of other men. The course of history as well as that of nature is governed by internal laws, the laws of dialectics.

But this distinction between nature operating blindly and men operating consciously, important as it is for historical investigation, particularly of single epochs and events, cannot alter the fact that the course of history is governed by inner general laws. For here, also, on the whole, in spite of the consciously desired aims of all individuals, accident apparently reigns on the surface. That which is willed happens but rarely; in the majority of instances the numerous desired ends cross and conflict with one another, or these ends themselves are from the outset incapable of realisation or the means of attaining them are insufficient. The conflict of innumerable individual wills and individual actions in the domain of history produces a state of affairs entirely analogous to that in the realm of unconscious nature. The ends of the actions
are intended, but the results which actually follow from these actions are not intended; or when they do seem to correspond to the end intended, they ultimately have consequences quite other than those intended. Historical events thus appear on the whole to be likewise governed by chance. But where on the surface accidents hold sway, there actually it is always governed by inner, hidden laws and it is only a matter of discovering these laws.

Men make their own history, whatever its outcome may be, in that each person follows his own consciously desired end, and it is precisely the resultant of these many wills operating in different directions and of their manifold effects upon the outer world that constitutes history. Thus it is also a question of what the many individuals desire. The will is determined by passion or deliberation. But the levers which immediately determine passion or deliberation are of very different kinds. Partly they may be external objects, partly ideal motives, ambition, "enthusiasm for truth and justice", personal hatred or even purely individual whims of all kinds. But, on the other hand, we have seen that the many individual wills active in history for the most part produce results quite other than those they intended --- often quite the opposite; their motives therefore in relation to the total result are likewise of only secondary significance. On the other hand, the further question arises: what driving forces in turn stand behind these motives? What are the historical causes which transform themselves into these motives in the brains of the actors? (137)
The four kinds of opposition:

In the presentation of the Marxist dialectic the words "opposites", "contradictories", "contraries" were used interchangeably. This was especially true in the consideration of the first law of dialectic: the unity of opposites. The examples of this law were of many kinds: the unity of life and death in living beings; the unity of negative and positive electricity; the identification of motion with rest, and of the circle with polygon; the unity of opposite sexes. All of these examples were to illustrate the one law of opposition.

Nowhere do any of the Marxists define what they mean by opposition, nor do they define the various kinds of opposition. It is most important to know if all these examples of opposition have the same characteristics. It is important to know if all kinds of opposition cause conflict in beings.

In his treatment of opposition Aristotle says that we can speak of four kinds:

With regard to opposites one must say that they are usually opposed in several manners. Indeed, one thing is said to be opposed to another in four ways: as relatives, or as contraries, or as privation and habit, or as affirmation and negation. (139)
Then Aristotle goes on to give an example of each:

An instance of the use of the word 'opposite' with reference to correlatives is afforded by the expressions 'double' and 'half'; with reference to contraries by 'bad' and 'good'. Opposites in the sense of 'privation' and 'habitus' are blindness and sight; in the sense of affirmation and negation, the propositions, 'he sits' 'he does not sit'. (139)

Aristotle starts with the opposition of relation, then considers in turn the opposition of contrariety, of privation, and contradiction. Sometimes it seems that Aristotle's order of presentation as well as his divisions are arbitrary. We should like to see just one instance, however, where either his order or divisions are shown to be merely arbitrary, particularly in his philosophical works that treat of the communia. In our consideration we shall try to show that the order of presentation is logical, and that the division into four kinds of opposition is essential.

On first glance it seems that the four kinds of opposition can be reduced to two: to opposition of correlatives, and to opposition of negation. For the first of the four appears to be distinct from the others in that no incompatibility is present between the terms of the opposition but merely correlation; but in all the other three there is an incompatibility between the terms, and, therefore, they all seem to come under the opposition of contradiction. In order to show that these last three cannot all be grouped simply under one species of opposition, that is, under
contradiction, it will be necessary to show that there are essential differences among the kinds of incompatibility.

There is one order of consideration of opposition which proceeds according to the degree of exclusion of one term of opposition by the other --- that is the order Aristotle has given above. But another order is possible, the order of opposition according to the real existence of the terms. If we consider the opposition from the point of view of being, then the order must be reversed, since it is evident that contradiction denies real being more absolutely than any of the other --- it removes the opposite term completely. But neither privation nor contrariety deny their opposite term absolutely; and instead of denying its opposite term, the relative term demands its existence. (140) Because a treatment of opposition should proceed according to that which is most formal, Aristotle develops his doctrine according to progression toward absolute incompatibility of terms, since what is most formal in the term 'opposition' is the notion of exclusion. (141) The "being" of opposites is in inverse proportion to the degree of opposition.

I. The Opposition of Relation:

The opposition of relation is manifested in Aristotle in two places in the Categories. The first of these logical definitions is:
Those things are said to be relative which are according to their very being said of other things, or which are said in reference to something else in some other way. (142)

And later on he says:

All those things are opposed as relatives which are, according to their very being, said of opposite things, or which are said in reference to opposite things in some other way. (143)

We can look at the terms of relative opposition from a double point of view: a) as terms that mutually complement each other; b) as terms that mutually exclude each other in some degree. In the first respect we consider the terms as the elements which make up that which is called relationship, as in the case of father and son. These two terms constitute the material elements of the relationship (we consider the foundation as the formal constitutive element), so that without both of them the relationship could not exist. Here we do not look upon the terms as excluding each other — as the term father necessarily excludes the term son — but rather as parts of a union that is described as a relationship.

If we consider the terms from the point of view of mutual exclusion, as father excludes son, then we consider relationship as participating to some degree in contradiction. For even though the two terms exist simultaneously, they do exclude each other by definition. Therefore, they cannot be identified to the extent that one term is synonymous with the other. Real coexistence
is not destroyed --- it is necessary in a relation that is real ---
but formal or essential identification is absolutely impossible.
Thus it participates, though in the lowest degree, of contradiction.

Relation differs from the other kinds of opposition because in all the other three the one term negates the other so that co-existence is denied. But in relation only essential identification is denied --- not co-existence. (144) We cannot speak of "son" unless there is a "father". We cannot say one quantity is the double of another, without admitting that the other quantity is half of the double; we cannot speak of a capacity without at the same time acknowledging that for which there is a capacity.

Aristotle, however, says that the co-existence is not necessary in certain cases, and gives as one example, the relation between knower and object known. He says that it is not necessary that the object come into existence simultaneously with the knowing power, just as the disappearance of the knowing power does not destroy the real existence of the object.

Correlatives are thought to come into existence simultaneously. This is for the most part true, as in the case of the double and the half. The existence of the half necessitates the existence of that of which it is half. Similarly the existence of that of a master necessitates the existence of a slave, and that of a slave implies that of a master; these are merely instances of a general rule. Moreover, they cancel one another; for it there is no double it follows that there is no half, and vice versa; this rule also applies to all such
correlatives. The object of knowledge would appear to exist before knowledge itself, for it is usually the case that we acquire knowledge of objects already existing; it would be difficult if not impossible to find a branch of knowledge the beginning of the existence of which was contemporaneous with that of its object. Again, while the object of knowledge, if it ceases to exist, cancels at the same time the knowledge which was its correlative, the converse of this is not true. (145)

In the example of knowledge, however, there is not a perfect relationship set up between the terms: the relationship is not mutual. And this accounts for the fact that simultaneity is not required. In the knower there is a real relationship towards the object, since the knowledge is caused by the object. But on the part of the object, the real existing thing, there is no real relationship towards a knowing power. There is but an extrinsic denomination of relationship on the part of the real being. We hesitate to call this being "object," for in its entitative existence, the being is not an object. It is formally object only when related to a knowing power. Wherever there is a real relationship set up in both terms, there must be simultaneous existence. Strictly speaking, therefore, we can say that even in the case of knowledge there must be simultaneous existence, since a being receives the attribution "object" only because it is known: as long as there is knowledge, there must be an "object." Considered in its entitative being, however, the thing known does not have to exist simultaneously with the knowing power. (146)

In all opposition except relation, one of the
terms is a non-ens or participates in non-ens. The one term negates the other, so that one term is opposed to the other as perfection to imperfection. Contradiction and privation are negation of forms in themselves, while contrariety, which necessarily participates in privation, is the negation of a simultaneous existence of the form in the same subject. This is fundamentally the reason why according to Catholic doctrine, the only possible opposition in God is the opposition of relation: because neither of the terms of relation denote imperfection. (147) There is no imperfection that results from the negation by the opposite term. (148)

As was already indicated in the difficulty about the coexistence of the relative terms, there are several kinds of relation. The relation between knower and object was, from one point of view, a real relation, but only logical i.e. an extrinsic denomination --- from the side of the object known. This shows that we must distinguish at least two kinds of relation: real relation, and logical relation. There is in addition to these a relation called transcendental. Among these three kinds of relation there is but a unity of analogy. Let us now see what is the primary division of relation, for the term "real relation" as well as the terms "logical" and "transcendental" appears to be generic.

The first division of relation is into proper and improper. (149) The proper relatives are those whose whole being
consists in relationship — they do not belong primarily to any other category of being. These are defined by Aristotle: "Those things are relatives whose very being it is to stand in reference to something else in some way." Because their very being or essence is constituted by relationship, they constitute a special category. (150) This category is distinguished both from substance, which has self existence, and from the other accidents which has existence in substance. Relation, according to its strict or proper definition, is apart from all of these, since its essence consists neither in being in itself as substance is, nor in another, but solely in relationship toward. It consists solely in the bond between distinct terms.

The relatives improperly so called are those which, while having the correlation of terms, does not exist primarily as relation, but as one of the nine other categories — either as substance (or principles of substance), or as one of the categories that inhere in substance. These are called transcendental relations, because they transcend the limitations of one category: in so far as they are relatives they partake in the characteristics of the category relation, but they belong essentially and primarily to one of the other categories, or to several or to all. Thus potency and act constitute a relation that belongs to all the categories; matter and form constitute a relation, belonging primarily to corporeal substance, and secondarily to the other natural accidents; the relationship of creature to God is present in all the categories — but in each
instance it is not the relationship which is that which is primary, but it is in each case the substance, or quantity, or quality, etc..

Transcendental relations are included in the essence of something belonging to one of the absolute categories, but the relationship is secondary to the entitative character of the essence. But relation in the strict sense (secundum esse as contrasted with the above, secundum dici) is one whose essence consists in the relation of terms, and one which is not essentially bound up with something absolute, but fixes itself upon two absolutes in such a way as to impart a relationship that did not formerly exist there. Thus, it is impossible to abstract the notion or relation from the transcendental, but the relation secundum esse can always and must always be distinguished from the beings that make up its terms. It is impossible, for example, to abstract from the relationship when we consider the principles of substantial being, matter and form. But the notion of paternity or of filiation is distinct from the notion of rational animal which is at each term of the relationship of father to son and vice versa.

The second division of relation is into real and logical. Transcendental relation is, of course, a real relation, for it exists independently of any consideration of the mind. But the relation secundum esse is divided into real and logical relation. The real relation in this case is called predicamental, because it constitutes one of the ten predicaments that specify real being.
Praedicamental relation is distinguished from logical by the following characteristics: the subject (first term of relative opposition) is a real entity; the terminus (second term of relative opposition) is also real entity and distinct from the first term; the foundation of the relation must be real. The relatives must be of the same order. Any relation that lacks any of those conditions is to that extent a logical relation. Thus, the relation in cognition is not praedicamental, because the one term of the opposition is merely logical, i.e., on the part of the object known, since the object is not affected in any way by being known. Likewise the relationship between God and creatures is not praedicamental, because no real relationship is set up in God by the fact of creation, though there is real relation of causality looking from creatures to God.

Both praedicamental relation as well as logical has genera with diverse species under them.

The predicamental relation is divided into three species according to the three kinds of foundations upon which the relation is based. The relation can have as its foundation either quantity, or quality, or measure, or action and passion. And this foundation is the cause of the relation.

The logical relation, also, is divided into species according to the foundation. And thus we have a certain group
of logical relations which are called second intentions; and we have others in which the reason arbitrarily unites two concepts.

In the three genera of relation, namely, transcendental, predicamental, and logical there is one thing in common, the correlation. The term correlation, however, is analogous and, so, is said in different ways of the three kinds of relation.

The statement that all relatives have correlatives is acceptable as such and is not conflicting with the statement that correlation is a property of the relatives. All relatives have correlatives, that is, the relatives proper have determined correlatives and the relatives improper have undetermined correlatives. This distinction is not a manufacture of our own, it is found literally in the Metaphysics. There Aristotle himself distinguishes between determined and undetermined relations, between the relation of the double to the one and the relation of the many to the one... (151)

This kind of opposition cannot give rise to the intrinsic conflict of which the Marxists speak. If there is conflict, it must come from some other kind of opposition.

The Opposition of Contrariety:

The second kind of opposition may be manifested by Aristotle's various attributions of the term "contrary":

The term 'contrary' is applied 1) to those attributes differing in genus which cannot belong at the same time to the same subject, 2) to the most different of the things in the same genus, 3) to the most different of the attributes in the same recipient subject, 4) to the most different of the things that fall under the same faculty, 5) to the things whose difference is greatest
either absolutely or in genus or in species. (152)

These specifications seem to contradict each other in some respects, for example, when he says in the first instance that the contraries are in different genera, and in the second that they belong to the same genus. We shall try to see what characteristics are peculiar to contrariety, so that we can give a proper definition of it.

The definition is made more complete further on in the Metaphysics, where Aristotle says:

Since things which differ may differ from one another more or less, there is also a greatest difference, and this I call contrariety. That contrariety is the greatest difference is made clear by induction. For things which differ in genus have no way to one another, but are too far distant and are not comparable; and for things that differ in species the extremes from which generation takes place are the contraries, and the distance between extremes --- and therefore that between the contraries --- is the greatest....

And the other commonly accepted definitions of contraries are also necessarily true. For not only is 1) the complete difference the greatest difference (for we can get no difference beyond it of things differing either in genus or in species; for it has been shown that there is no 'difference' between anything and the things outside its genus, and among the things which differ in species the complete difference is the greatest); but also, 2) the things in the same genus which differ most are contrary (for the complete difference is the greatest difference between species of the same genus); and 3) the things in the same receptive material which differ most are contrary (for the matter is the same for contraries); and 4) of the things which fall under the same faculty the most different are contrary (for one science deals with one class of things, and in these the complete difference is the greatest). (153)

This gives us a more complete description of contrariety, for it tells us that contraries are 1) the extreme differ-
ences, 2) of a common genus, 3) referring to a common subject.
With this as a foundation, and with the additional difference Aristotle
gives in his distinction between contraries and privatives, we can
proceed to give a complete definition of the opposition of contrariety.

The contraries are extreme differences. It
is possible for things to differ from one another more or less, but
they are called contraries only when the maximum distance separates
them. If there were no maximum distance or fixed limit beyond which
they could not go, then it would be possible for the two terms to
differ ad infinitum --- this, however, would take away any real
distinction between the two, for we could not strictly speak of two.

Now the maximum difference consists in a
specific difference, for all within the one species is simply one.
For example, we cannot speak of a diversity within any substantial
species, for no man is more man than another. Likewise we cannot
speak of a diversity within an accidental species, for if a color is
white (and not merely a mixture) we cannot say there is any diversity
in the white itself. If there is diversity within something of one
species, it is because it is not merely one species, but is the combi-
nation of the two extremes, for example, when we say one thing is more
white than another. This is due to the combination of the two extremes
which are specifically distinct. Thus, the contraries, which are the
extreme differences, are the specific differences of a common genus.

There must be a common genus, otherwise we
could not make any comparison between the limits. Comparison always needs a common genus, just as all measurement needs a common unit of measurement. And unless there is a common genus, the extremes can be called contraries only in the improper sense. (154) The contraries are of two kinds, univocal and equivocal (or proper and improper). The univocal contraries are those which are specifically different in a proximate genus, as are black and white; or those which are in diverse genera, but have a common remote genus, for example, virtue and vice are distinct genera, yet they have a common genus, which is the first species of quality. If there is no common genus whatever, they are contraries in the improper sense. Thus the transcendental do not have a common genus, since they are co-extensive with being, which is above all genera. Good and evil therefore cannot be contraries in the proper sense, since good is one of the transcendental, while evil is its negation.

Moreover, it is necessary that pairs of contraries should in all cases either belong to the same genus or belong to contrary genera or be themselves genera. White and black belong to the same genus, colour; justice and injustice, to contrary genera, virtue and vice; while good and evil do not belong to genera, but are themselves actual genera, with terms under them. (155)

Contraries must not only be in the same genus but must also have reference to the same subject, otherwise there cannot be opposition, except by definition —— there would not be mutual exclusion which is had between contraries. To this can be reduced the statement of Aristotle, that the word 'contrary' is
applied "to the most different of the things that fall under the same faculty". (156) The contraries have the same subject matter, and it is for that reason that there can be movement from the one to the other, and the one is engendered from the other. Things which differ the most under one faculty, as art or science, are contraries --- contraries are always studied under the one science. Disease and health must have a common subject, the human body; black and white have a common subject, and real quantity; justice and injustice require as their subject the human soul. (157) Thus, we find a second common characteristic of the contraries, they have in addition to a common logical subject (genus) a common physical subject.

From the fact that contraries have a common genus as well as a common physical subject we can conclude that contraries are both positive terms, that is, that both terms can have real entitative existence. One of the terms is not merely a negation of the other. Since they have a common genus, it means that they have a common entitative determination: thus black is not merely the negation of white, but is a color in the common genus. Disease is not merely the negation of health, but is a positive condition, a real qualitative form, of an animal body; vice is not merely the negation of virtue, but it is a positive habitus in the soul.

According to Aristotle, there are two kinds of proper contraries: one kind has a medium between its opposite
term, while the other kind does not have a medium. If one or other of the contraries which are naturally present to a subject must be present in the subject, those contraries are without a medium. There cannot be an intermediate condition. Thus, disease and health are naturally present in the body of an animal, and it is necessary that either the one or the other should be present in the body of an animal. Odd and even, likewise, are predicated of number, and it is necessary that the one or the other should be present in numbers. The reason for this absence of medium is the necessity of the inherence of one or the other forms, otherwise it would be possible to have an intermediate form. But certain forms seem not to permit of intermediate predication.

On the other hand, among those contraries whose predication is not necessarily demanded by the subject, there is always an intermediary. It is not necessary that a body be black or white, even though the body is the subject for contraries under the genus color. It is possible for a body to be red, or green, each of which is an intermediary color. We do not always have a proper name for each of the intermediaries --- that is indeed, impossible, because the medium is divisible ad infinitum --- but for some of the intermediaries we choose arbitrary names, to indicate degrees of difference.

In those contraries which do not admit of a
medium, we must have either the one form or the other. The combination of the two forms is impossible. Thus sickness and health absolutely exclude each other, according to Aristotle. This point is still obscure for us, because it seems that even here we do have an intermediary condition possible. If we can speak of a person's sickness becoming worse it means that there is some kind of medium in which there is a measure of health and sickness. Calling a person 'sick' seems to be an arbitrary predication, for it is not possible to indicate the precise moment when a healthy man is said to become a sick man --- it is rather a gradual process. Just as there is no precise moment when we can say a person has tuberculosis, for everyone has a certain number of these germs in his system at all times, we cannot say that the one contrary is present absolutely alone, to the absolute exclusion of the other. A medium always seems necessary wherever there are contraries. If either health or sickness absolutely must be present in an animal, then it is practically impossible for anyone to say that he is healthy, for there is always some degree of better health possible than that which is actually possessed. All this would seem to indicate that there is an intermediate state between all contraries, wherever it is question of a real being.

In mathematics, however, where we deal only with formal causes, one or other of the contraries must be present absolutely --- to the total exclusion of the other. The reason for
This is that medium, intermediary is said only of real existing bodies. Mathematical entities are not real. One form absolutely excludes the other. There is no real becoming of one thing from the other in mathematics. Even though mathematicians speak of the generation of one mathematical form from another, real generation is absolutely out of the question, for real movement is out of the question. Only in mathematical contraries, it seems to us, do we exclude the intermediaries between contraries.

Intermediaries are in the same genus as the things between which they stand, for we reach intermediaries in our passage from one of the contraries to the other. The intermediaries are composed of the extreme terms of contrary opposition. They share in each of the contraries to a greater or lesser degree, depending how far they are from the one extreme and how near to the other. (158)

Contraries are always qualitative forms, or forms of action and passion, or forms of position. Aristotle calls all of these contraries, if they verify the above-named conditions for contrary opposition. Outside of these categories there are no contrary forms in the proper sense. And in the examples of each of these, Aristotle admits a variation of degree, thereby indicating that all contraries have a medium. He is not certain, however, about certain qualities.
One quality may be the contrary of another; thus justice is the contrary of injustice, whiteness of blackness, and so on ... Qualities admit of variation of degree. Whiteness is predicated of one thing in a greater or less degree than of another. This is also the case with reference to justice. Moreover, one and the same thing may exhibit a quality in a greater degree than it did before: if a thing is white, it may become whiter.

Though this is generally the case, there are exceptions. For if we should say that justice admitted of variation of degree, difficulties might ensue, and this is true with regard to all those qualities which are dispositions. There are some, indeed, who dispute the possibility of variation here. They maintain that justice and health cannot very well admit of variation of degree themselves, but that people vary in the degree in which they possess these qualities, and that this is the case with grammatical learning and all those qualities which are classed as dispositions. However that may be, it is an incontrovertible fact that the things which in virtue of these qualities are said to be what they are vary in the degree in which they possess them; for one man is said to be better versed in grammar, or more healthy of just, than another, and so on. (159)

The other two categories that admit of contraries are action and passion, and position.

Action and affection both admit of contraries and also of variation of degree. Heating is the contrary of cooling, being heated of being cooled, being glad of being vexed. Thus they admit of contraries. They also admit of variation of degree: for it is possible to heat in a greater or less degree; also to be heated in a greater or less degree. Thus action and affection also admit of variation of degree. So much, then, is stated with regard to these categories.

We spoke moreover, of the category of position when we were dealing with that of relation, and stated that such terms derived their names from those of corresponding attitudes. (160)

Substantial forms are not contraries. Even though Aristotle calls the principles of substance contraries in one part of the first book of the Physics, later in the book he identifies
them as form and privation. Privation and form are not distinguished as contraries, for one of the terms is negative — both terms must be positive in the contraries, since both are in the same genus and in the same physical subject. Likewise, in substantial generation or passing away it is impossible to have a medium in the strict sense, for substantial forms are "sicut numeri". They change from the one to the other without movement or progression in the form. Substantial form gives first being to a thing, or esse simpliciter, so that we cannot speak of a common genus for diverse substantial forms, even though they have a common physical subject.

Nor is destruction movement; for the contrary of movement is movement or rest, but the contrary of destruction is generation. Since every movement is a change, and the kinds of change are the three named above, and of these those in the way of generation and destruction are not movements, and these are the changes from a thing to its contradictory, it follows that only change from positive to positive is movement....There is no movement in respect of substance (because there is nothing contrary to substance).

(161)

Finally, Aristotle excludes quantities from the opposition of contrariety. Quantitative oppositions are relative: they do not exclude each other, but rather are explained one through the other, which is characteristic of relative opposition.

Again whether we define them as quantitative or not, they have no contraries; for how can there be a contrary of an attribute which is not to be apprehended in or by itself, but only by reference to something external. Again, if 'great' and 'small' are contraries, it comes about that the same subject can admit contrary qualities at one and the same time, and that things will themselves be contrary
to themselves. For it happens at times that the same thing is both small and great. For the same thing may be small in comparison with one thing, and great in comparison with another, so that the same thing comes to be both small and great at one and the same time, and is of such a nature as to admit contrary qualities at one and the same moment. Yet it was agreed, when substance was being discussed, that nothing admits contrary qualities at one and the same moment. For though substance is capable of admitting contrary qualities, yet no one is at the same time both sick and healthy, nothing is at the same time both white and black. Nor is there anything which is qualified in contrary ways at one and the same time. (162)

Contraries exclude simultaneous existence in the same subject. Every opposition has terms one of which excludes the other in some way. We saw that relatives exclude each other from their definition, though co-existence in the same subject is by no means excluded. The next degree of opposition, that of contrariety, both excludes one term from the other by definition (for contraries are specifically distinct), but it also prevents the two terms from having simultaneous existence in the same subject. Experience is sufficient to show this: for black excludes white from the same subject; heat excludes cold; virtue excludes vice.

Contraries exclude each other because they are founded on a higher degree of opposition, namely, privation. And the privation in the subject is due ultimately to the natural limitation of the subject. The subject has a natural capacity for all contrary forms of one genus, but it is limited in actual condition of possession to one of them. Thus, we consider the exclusion of the contrary
form as the effect that follows upon the reception of the other
form, rather than as a privation which existed prior to the reception
of the contrary.

Now only positive and negative absolutely
exclude each other. All opposition is based ultimately on contradiction, because there we have absolute opposition between being and non-being. Wherever the opposition is between positive and negative, as in the last two kinds of opposition (privation and contradiction), the forms absolutely exclude each other. And in these the exclusion is not merely an effect following upon the reception of a different form, but prior to the reception there must be in the subject an absolute negation of one form. (163)

Contraries, however, are not opposed as positive and negative, for both terms of contrariety are positive. Therefore, they exclude each other by reason of the subject. The subject is incapable of possessing both forms simultaneously, for it has a real capacity for only one form.

In speaking of contraries we must always remember that the contraries are the extreme differences of a common genus, and not any difference whatsoever within the genus. It is only the extremes of the genus which completely exclude each other. Wherever there is a medium between the contrary terms, then it is possible for
contraries to exist simultaneously to a limited degree in the same subject. It is our opinion that all contraries in the strict sense have these intermediates. Whenever there is a progression from one contrary term to the other, there is a mixture of the contraries, and so simultaneous existence in their lesser degrees. As long as we are in the condition of intermediaries we are in movement (the generation of the new contrary form is still in fieri), and there is not yet the actual possession of one contrary in its perfect form. Hence there is no complete opposition, unless we speak of the term in its condition of actual, perfect existence. (164)

The denomination of the quality in its state of fieri is according to the predominant quality. It is evident that this is more or less arbitrary. Thus, we call a thing white, if it is more white than black; or we call something hot, if it seems more hot than cold. (Examples are not always clear, for it is difficult at times to say whether we are treating of real contraries, or rather of opposition of privation). Privation, which absolutely excludes its opposed form, does not allow an intermediary state. Change but not movement is possible where privation is involved; only absolute denomination is possible.

The contraries, therefore, include the opposition of privation and contradiction non primo et per se, sed consecutive et secundario. The exclusion of one form results from the presence of the contrary. (165)
Therefore, when the Marxists speak of the identification of contrary qualities, they can mean only a simultaneous existence of contraries in their lesser degrees, when the contraries are in a state of becoming. It is absolutely impossible to have identification of contraries in their perfect state of actuality. And when there is a certain identification of contraries in the state of movement because of the common subject (and not because of real identification of the forms), there is no conflict in this movement. It is natural that in a progression from one contrary to another there be a union of the two contraries in their lesser degrees, for there is an intermediary state which must be passed. In the opposition of contrariety as in the opposition of relation there is neither conflict, nor identification of opposites. There is a union of contraries in the state of motion — this is the closest approach we have in the first two kinds of opposition to the fundamental law of Hegelian and Marxist dialectics. (166)
Opposition of Privation:

The third kind of opposition is that of privation. More correctly, it is the opposition between the possession of a certain form and the privation of that form. The two terms of opposition cannot, therefore, both be positive, since the one term is essentially the negation of the other.

Now there are various ways of speaking of the opposition between the possession and the negation of the form in a subject. Aristotle first gives the various meanings of the word 'privation', and then determines the special sense in which he understands it.

We speak of 'privation' 1) if something has not one of the attributes which a thing might naturally have, even if this thing itself would not naturally have it; e.g., a plant is said to be (deprived) of eyes ---; 2) If, though either the thing itself or its genus would naturally have an attribute, it has it not; e.g., a blind man and a mole are in different senses 'deprived' of sight; the latter in contrast with its genus, the former in contrast with his own normal nature. --- 3) If, though it would naturally have it, and when it would naturally have it, it has it not; for blindness is a privation, but one is not blind at any and every age, but only if one has not sight at the age at which one would naturally have it. Similarly a thing is called blind if it has not sight in the medium in which, and in respect of the organ in respect of which, and with reference to the object with reference to which, and in the circumstances in which, it would naturally have it. --- 4) The violent taking away of anything is called privation.

Privation in the most proper sense is the third of these. It is the absence of a form in a subject that has a
natural capacity for that form at the time and under the circumstances that are determined by nature.

We say that that which is capable of some particular faculty or possession has suffered privation when the faculty or possession in question is in no way present in that in which, and at the time at which, it should naturally be present. We do not call that toothless which has not teeth, or that blind which has not sight, but rather that which has not teeth or sight at the time when by nature it should. For there are some creatures which from birth are without sight, or without teeth, but these are not called toothless or blind. (168)

The terms in the opposition of privation both refer to the same real subject, even though one of the terms is itself not a reality, but is rather a negation. But this reference to the same subject depends on the nature of the privation. One kind of privation has immediate reference to the subject of the form, as darkness has immediate reference to the atmosphere. And in this there can be a mutual change from light to darkness, and from darkness to light. But there is a second kind of privation, wherein there is not an immediate reference to the subject, but rather to the form immediately and to the subject secondarily. Thus, blindness has reference immediately to the form 'sight'; death immediately refers to life, and both secondarily to the subject in which those forms exist. Between the terms of this kind of opposition there is no mutual change. (169)

In our consideration of contraries we said that they are founded immediately upon a privation. The distinction
just made determines what kind of privation contraries are founded upon. Contraries with a medium can mutually change one into the other, therefore they are founded upon the privation that looks immediately to the subject in which the form inheres. The opposition which is founded immediately upon the negation of a form, as blindness and death are opposed to sight and life, does not permit a mutual change. Therefore, contraries which are generated one from the other cannot be founded immediately on this kind of privation.

Privation in the most strict sense is that in which the order from the one term to the other is not reversible. And for that reason Aristotle added the word 'order' in speaking of the opposition of privation. The terms of opposition both have reference to the same real subject, but there is a certain order between the terms. Thus it is impossible for death to take place unless there has previously been life --- the change is only in one direction.

Wherever the terms of opposition are related immediately towards a common subject, there can be mutual change from one to the other. And this is the kind of privation spoken of in the first book of the *Physics* of Aristotle, where privation is called one of the principles of becoming. Privation here means simply the negation of a form in a subject that is capable of possessing that form at the time and under the circumstances in which it now is. Wherever there is a coming to be of one form in the subject this kind of privation
must precede, and for that reason privation is called a principle of movement or becoming.

The opposition of privation differs from that of relation as well as that of contrariety.

It differs from relation because the terms of relation mutually perfect each other; because they are both positive; because they are necessarily present in the same subject simultaneously. But the terms of privative opposition negate each other entirely; only one is a positive term; consequently they cannot exist simultaneously in the same subject, because one of them is by definition the absence of the positive form. In reality, we cannot speak of the real existence of the privative at all, since only real forms exist in reality --- the privative is but the negation of a form for which the subject has a capacity here and now. (170)

Privative opposition differs from opposition of contrariety, both where there is a medium and where there is not. The terms of contrary opposition are both positive: they indicate a positive determination of the real subject; they are at least in the same remote genus. But privatives are not both positive, as we have just seen. Consequently, it is impossible that they both be in the same genus, for a genus has under it only positive determinations. All the differences that Aristotle points out between the privatives and the contraries are based on this fundamental difference --- that
both terms of contrariety are positive, while one term of privation is negative. (171)

Privation is a kind of contradiction. It is, within certain limits, the opposition between being and non-being, since the possession of the form can be called being, while its absence is non-being. But it is contradiction within certain limits, for it is restricted to a particular subject and to a particular form.

But privation is a kind of contradiction; for what suffers privation, either in general or in some determinate way, is either that which is quite incapable of having some attribute or that which, being of such a nature as to have it, has it not; here we have a variety of meanings, which have been distinguished elsewhere. Privation, therefore, is a contradiction or incapacity which is determinate or taken along with the receptive material. (172)

Privation is not a contradiction absolutely, since a contradiction by definition does not require a certain capacity or aptitude for the form that is negated, nor does it even demand the existence of a real subject. Contradiction can be applied to any kind of being whatsoever. But privation requires a definite subject, in which there is a definite capacity for the form that is absent. The opposition of contradiction is absolute and universally extensive, but the opposition of privation is limited to a certain subject and to a determined form. (173)

Privation has this twofold aspect: on the one hand, it is a negation, and within the limits of the subject it has the
same force as the opposition of contradiction, since it is founded immediately on the opposition of being and non-being. On the other hand, from the aspect of the subject, privation delineates something positive — a positive capacity or aptitude in the subject for a form which is absent. In speaking of privation as something positive, however, there must be no confusion of privation and the capacity. The privation of the form is not the capacity or potency of the subject for the form. The potency is something positive, while the privation is negative. The potency is one term of the opposition of relation, having a transcendental relationship to the form which will actualize it. The potency is a \textit{per se} principle of real being, but privation is not.

From this analysis of the opposition of privation, we cannot found any ground for the Marxist laws of dialectics. The fundamental law, that of unity of opposites, cannot arise from the opposition of privation. It is absolutely impossible for the terms of opposition to be present simultaneously, since by very definition the one is the negation of the other. Conflict can come only when two positive forces existing simultaneously act upon each other. The terms of privative opposition are neither both positive nor simultaneously present in the same subject.

\textbf{Opposition of Contradiction}:

The last of the four kinds of opposition is
that of contradiction. Aristotle immediately sets it off from the other three kinds.

Statements opposed as affirmation and negation belong manifestly to a class which is distinct, for in this case only, it is necessary for the one opposite to be true and the other false. (174)

The terms of contradictory opposition differs from the former kinds in that one of the opposites is necessarily true, and the other necessarily false.

Neither in the case of contraries, nor in the case of correlatives, nor in the case of 'possession' and 'privation' is it necessary for one to be true and the other false. Health and disease are contraries: neither of them is true or false. 'Double' and 'half' are opposed to each other as correlatives: neither of them is true or false. The case is the same, of course, with regard to 'positives' and 'privatives' such as 'sight' and 'blindness'. In short, where there is no sort of combination of words, truth and falsity have no place, and all the opposites we have mentioned so far consist of simple words. (175)

The opposition of contradiction, therefore, takes place within the judgement. This is indicated by the etymology of the word: contra and dicere. One statement is opposed to another statement. The other kinds of opposition, as Aristotle states, have terms that are simple words, and so there is not yet an act of judgement.

Even when the terms of the other kinds of opposition enter into propositions and judgements, however, they do not
thereby become opposition of contradiction. In order to have contradiction there must be affirmation and negation of the same thing.

At the same time, when the words which enter into opposed statements are contraries, these, more than any other set of opposites, would seem to claim this characteristic. 'Socrates is ill' is the contrary of 'Socrates is well', but not even of such composite expressions is it true to say that one of the pair must always be true and the other false. For if Socrates exists, one will be true and the other false, but if he does not exist, both will be false; for neither 'Socrates is ill', nor, 'Socrates is well' is true, if Socrates does not exist at all.

In the case of 'possession' and 'privation', if the subject does not exist at all, neither proposition is true, but even if the subject exists, it is not always the fact that one is true and the other false. For 'Socrates has sight' is the opposite of 'Socrates is blind' in the sense of the word 'opposite' which applies to possession and privation. Now if Socrates exists, it is not necessary that one should be true and the other false, for when he is not yet able to acquire the power of vision, both are false, as also if Socrates is altogether non-existent. (176)

Where the opposition, however, consists in an absolute negation of what has been affirmed by the judgement, then one part of the opposition must be true and the other part false. And this holds true whether the subject really exists or not.

But in the case of affirmation and negation, whether the subject exists or not, one is always false and the other true. For manifestly, & if Socrates exists, one of the two propositions, 'Socrates is ill', 'Socrates is not ill', is true, and the other false. This is likewise the case if he does not exist; for if he does not exist, to say that he is ill is false, to say that he is not ill is true. Thus it is in the case of those opposites, only, which are opposite in the sense in which the term is used with
reference to affirmation and negation, that the rule holds good, that one of the pair must be true and the other false. (177)

We must distinguish between the affirmation and negation and that which is affirmed or denied --- that is, we must distinguish between the statement and its content. The affirmation and negation are acts of the judgement, but that which is predicated is objective and independent of the act of the mind. That which is predicated is the absolute distinction between being and non-being. And it is in this opposition between being and non-being that contradiction is founded. (178)

There cannot be, of course, a real extra-mental existence of non-being, since this would itself involve a contradiction. Only real forms have objective existence. But non-being is the negation of being which has real existence apart from the mind. Just as the existence is independent of the mind, so the non-existence or non-being (if the object does not really exist) does not depend upon the intellect.

In order to have opposition, however, we must have some kind of simultaneity between the terms of opposition. There must be some kind of union or comparison of terms. Here the mind enters in to give a logical existence to the negation which is non-being. The mind considers non-being after the manner of real being,
though objectively non-being is the same as pure nothing. Thus a certain simultaneity is given to the terms and the mind is better able to conceive of opposition between them. In the case of privation, we saw that it, too, is a non-being in reference to the form that is absent from the subject. But there we had a common subject, so that we could use that as the basis of comparison or basis of opposition. In the opposition between being and non-being we do not have the common subject, since the one is the absolute, unlimited negation of the other. They have nothing in common. In order to grasp this opposition more clearly, the opposition is formulated in what is called the principle of contradiction — the terms are affirmation and negation, acts of the judgement, where the mind sees clearly the incompatibility of being and non-being.

Since the negative term cannot have real existence, the Marxists cannot speak of contradictories existing simultaneously in the one being. The absolute negation of non-being is purely a logical entity. It does not have even the foundation in reality that other logical beings such as species, genera, etc. (second intentions) have, for these latter do have a positive determination that is found objectively in nature, though they cannot exist in nature as species or genera. And unless there is simultaneous existence in nature of two positive entities there cannot be conflict. In this final kind of opposition, contradiction, the Marxists do not have the basis for their fundamental law of dialectics.
A Dialectic is possible only where there is some kind of movement. In examining the four kinds of opposition we saw that real movement is had in only one of them, namely, in the contradictories which have a medium. Only there is verified the definition of movement: actus entis in potentia in quantum in potentia. In all the four kinds of opposition this is the only place where there is a semblance of conflict. Relatives are not in conflict, since they are mutually complementary. Privatives and contradictories have only one term that is positive. A purely negative term cannot exercise efficient causality. In the condition of becoming contraries exist simultaneously in the same subject, but within the limits defined in the part on contradictory opposition. We cannot say that one contrary contains the other. Rather, the common subject contains both contraries, when these latter are in an imperfect condition, the condition of potentiality and becoming.

Outside of the movement of contraries, a logical dialectic is possible. This is the movement considered in the Topics or Aristotle, as well as in the progressions of higher mathematics. The essential condition of each of these Dialectics is that the movement is logical and not real. It is a construction of the mind. Just as there is no real generation of truth in Aristotle's dialectic, so there is no real generation of a new mathematical form in the mathematical progression. An attempt to consider either of these as real movements would result in contradiction.
Hegelian Dialectic can speak of the conflict of contradictory elements because it abstracts from real being. Negation is given a kind of positive character, but with this defect, that Hegelians forget this attribution is purely logical. Marxists severely criticise Hegelian philosophy because, they say, "it abstracts from the real world". In their use of Hegelian laws they are, however, in exactly the same position, for the conflict they consider to be present in the very essence of natural beings cannot be there. To what extent we can admit conflict in nature will be considered in the final part of the dissertation.

The philosophy of conflict based on the first law of Hegelian Dialectic is without a valid foundation in reason. It cannot explain movement or becoming, because there is no such thing as intrinsic opposition in the essence of a natural being. The law of unity of opposites is formulated by Hegel without reference to reality. It gives a principle for the evolving of the whole of Hegelian philosophy, and as such it is a remarkable device. But the law is no more real than the system built upon it. It cannot account for real becoming. In the following and final part of the thesis we shall study becoming from the Aristotelian point of view, and in so doing we shall be able to see more clearly the false principle upon which the Marxist dialectics of nature is founded, namely, the confusion of the various kinds of opposition.
Aristotelian solution of the problem of becoming:

Certain of the ancient Greek philosophers tried to solve the problem of becoming by positing the real existence of non-being: different combinations of being and non-being, they said, accounted for multiplicity and diversity and change. Coming to be is the new combination of being and non-being. Both principles are equally real.

Marxist philosophers of nature, using Hegelian dialectics as their principle of movement, explain becoming through the simultaneous existence in all natural beings of contradictory principles. The instability caused by this conflict in the very essence drives the being on to a new state (called the synthesis), but even there no stability can be reached, since matter by its very nature is self-contradictory. Thus, an eternal motion of matter. Matter is made up of conflicting elements which may be called positive and negative, or being and non-being. The negating element is just as real as the positive element which is negated.

The ancients and the Marxists both see the necessity of "contrary" principles of being, otherwise variation and change would be impossible. These two basic principles explain all becoming: the non-being opposes being (it is just as real as being) and out of this condition of instability arises a new being.
Though the contradictory character of all natural beings is seen even in a static view of nature, that is, when we view nature as it was before and as it is after the change, the intrinsic conflict is brought out more clearly when we take a dynamic view of nature --- when we see the new being in the very process of becoming. Motion, the Marxists say, is the condition of everything in nature, because matter (the ultimate constitutive of everything) is essentially dialectical.

With the notions of being and non-being possessed by the ancient Greeks up to the time of Aristotle, a solution was impossible. If there were nothing but being absolutely, and non-being absolutely, then the dilemma of Parmenides could not be solved. To the genius of Aristotle belongs credit for an analysis of being and non-being that is the key to the whole of the philosophy of nature. Being and non-being are not the most fundamental philosophical principles: being itself undergoes an intrinsic division into principles of being which are not absolutes but relatives. And it is through relative being that becoming is ultimately explained.

Real being is divided into two principles of being, one of which is an actualizing principle and the other is potential. These principles of being are themselves real, though they cannot have separate existence as natural principles. Because they are relatives, there is mutual dependence one on the other both as to essence and to existence --- the actual principle defines the passive
principle, and the passive principle limits the actual, while at the same time each is dependent on the other for real existence.

The ancient Greek philosophers of nature did not admit anything more than accidental change in nature. For example, the division and separation of confused being, according to the opinion of Anaxagoras; the combinations of being and non-being (plenum and void) of Democritus; (179) none of these account for the coming to be of something new except in an accidental form. The combination alone is new: the elements that enter into the composition already existed in nature. (180)

Aristotle says that there is becoming in nature not only in the accidental order but also in the very substance of beings. And in this sense Aristotle teaches a more universal mobilism than that of the earlier Greek physicists. Among the various kinds of changes in nature, the most fundamental is substantial change, which is a coming to be or a passing away of the substantial nature itself.

In our analysis of the kinds of opposition we saw that movement in the strict sense is present only where there is contrary opposition. In the opposition of privatives we can speak of change, but not motion — which is defined as actus entis in potentia in quantum in potentia. In both substantial change and in movement, however, we have a third opposition, that of relation,
for change of any kind can be explained only through the principles of being, namely act and potency, which are principles of relative opposition. Translated into the language of the philosophy of nature this means that no change in nature can be explained without reference to the correlative principles of natural beings, matter and form.

Aristotle teaches that in order that there be change in nature, it is necessary that there be contrary principles. And he shows how all the ancient philosophers held this same basic truth, "constrained as it were by the truth itself".

...Everything that comes to be or passes away comes from, or passes into, its contrary or an intermediate state. But the intermediates are derived from the contraries --- colours, for instance, from black and white. Everything, therefore, that comes to be by a natural process is either a contrary or a product of contraries. Up to this point we have practically had most of the other writers on the subject with us, as I have already said: for all of them identify the elements, and what they call their principles, with the contraries, giving no reason indeed for the theory, but constrained as it were by the truth itself. (181)

In every change there is the loss of one thing and the acquisition of another. This we call the loss of one form and the coming to be of another. Therefore between these forms there is an opposition, since the coming to be of one is the privation of the other. In the first book of the Physics Aristotle calls this opposition contrariety.

This cannot be the opposition of contrariety
as we saw it in the four kinds of opposition, but rather it is contrariety in the broad sense. (182) In the first book of the Physics Aristotle speaks of contraries as a generic kind of opposition that includes both privation and contrariety in the strict sense. Now used in reference to the principles of natural beings "contraries" have to mean privatives, for in the science of nature we treat primarily of substance and only secondarily of accidents. We saw that contraries in the strict sense are always accidental characteristics. In substances we cannot speak of the form being more or less present — it is present simply or it is not, for substantial forms are totalities like whole numbers.

This making the principles of nature consist in contraries in the strict sense is the explanation why the ancients taught only accidental change in nature. They had not yet become explicitly aware of such things as substantial being — they spoke instead of heat and cold, of hatred and love, or hard and soft. And even Plato taught that substance has no contrary, consequently substance could not be generated nor cease to be. (183)

The contrary principles of nature are form and the privation of the form: and this takes care of both substantial and accidental natural beings. In every change there is a passage from the absence of a form to the possession of a form. Underlying these two privative terms of opposition is a common subject which is
said to pass from the condition of privation to the condition of possession. Hence, we have a third principle, namely, subject which Aristotle identifies with matter. The form and the privation of the form only are called contraries (in the broad sense), for between matter and form there is not opposition of privation but of relation; and privation is distinguished from matter only by a distinction of reason, as we shall see later.

In a natural change three principles are involved: the absence of a form (the point from which the change starts); the form which is to be possessed (the point at which the change terminates); and the subject or matter that underlies the change. Aristotle shows the necessity of this third principle of becoming through analogy with art, where it is always necessary to have some material, some subject that perdures. This, of course, would show the need of a subject in accidental change. No strict proof can be given that a subject is needed in substantial change, but by an analysis of the definition of substantial change and through the analogy of art, the mind can see the necessity of such a substratum.

Now in all cases other than substance it is plain that there must be some subject, namely, that which becomes. For we know that when a thing comes to be of such a quality or in such a relation, time, or place, a subject is always presupposed, since substance alone is not predicated of another subject, but everything else of substance. But that substances too, and anything else that can be said 'to be' without qualification, come to be from some substratum, will appear on examination. For we find in every case something that underlies from which
proceeds that which comes to be; for instance, animals and plants from seed. (184)

When speaking of the principles of natural beings as contraries, we can do so only in reference to their coming to be and not to their entitative condition. For only the principles of natural becoming (*fieri*) are contraries, while the principles of being (*in facto esse*) are relatives. The contrary principles of becoming are privation and possession of a form, but the principles of being are matter and form. There is a sense, then, in which we can speak of two principles of natural beings, and a sense in which we can speak of three.

There is a sense, therefore, in which we must declare the principles to be two, and a sense in which they are three; a sense in which the contraries are the principles --- and a sense in which they are not, since it is impossible for the contraries to be acted on by each other. But this difficulty also is solved by the fact that the substratum is different from the contraries, for it is itself not a contrary. (185)

The passage just quoted does not explicitly say that there are only two principles of natural beings in *facto esse*, and that they are relatives. But implicitly this is contained, for Aristotle says that matter is not a contrary, and after the change has taken place the privation no longer is, but only the form. Hence, in *facto esse*, there are only two principles, which are not contraries, but relatives, since they are mutually complementary. (186)
The Nature of the Material Principle:

The ancient physicists who did admit becoming were forced to admit the reality of non-being. But the non-being they had in mind was that which is identical with privation, namely the contrary or opposite of being. Thus, they could explain becoming only through a contradiction, that is, by identifying being pure and simple with non-being or negation.

Aristotle maintained that Parmenides was correct in insisting that being cannot come from being considered absolutely, just as it cannot come from absolute non-being. But through an intrinsic division of the notion of being he showed that there is a being and a non-being which is relative, and it is this that gives rise to new being or becoming.

Matter is not non-being in the absolute sense, nor is it being absolutely. Matter is the subject which is potentially being; it can enter into union with an actual principle to form absolute being. As potentiality it is neither negation of being absolutely, nor it is yet being in the full sense. It is the subject into which a new form can come to constitute a new complete being.

We ourselves are in agreement with them in holding that nothing can be said without qualification to come from what is not. But nevertheless we maintain that a thing may come to be from what is not --- that is, in a qualified sense. For a thing comes to be from the
privation, which in its own nature is not-being --- this not surviving as a constituent of the result.... In the same way we maintain that nothing comes to be from being, and that being does not come to be except in a qualified sense...Note further that we do not subvert the principle that everything either is or is not. This then is one way of solving the difficulty. Another consists in pointing out that the same things can be explained in terms of potentiality and actuality. (187)

This is the error that is common to all philosophies which try to explain becoming through conflict, they are ignorant of the nature of matter. In some way or other they identify matter with privation, or, in other words. they identify the opposition of relation with that of privation. They cannot conceive of non-being except in an absolute sense.

The ancients as well as the Marxists recognized change in nature, and they said that change had to be explained through contrary principles, but they did not go far enough and show that there is a third principle of becoming, matter, which is not a contrary. They admit two principles : form and its negation, but they did not speak of a subject which is common to these opposite terms. And it is precisely this common subject which is neither being nor non-being absolutely, the key to the problem of becoming.

All becoming is a change in a subject from the absence of a certain form to the possession of that form. And this is verified both in accidental and in substantial becoming. The
terminus a quo of becoming is a privation (the absence of a form) in a subject, and the terminus ad quem is the form possessed by the subject. Wherever contrary forms in the strict sense are involved there is a gradual change from the one term to the other, for there is a medium through which the underlying subject must pass --- and this is called motion in the proper sense of the word. In substantial changes, however, there is no gradual movement, for substantial forms have no contraries, as Aristotle declared, since they are the primary forms of any real being in nature --- there cannot be any medium prior to the possession of a substantial form, since the substantial form is necessary for the very existence of the being.

The subject of the change does not come to be in an unqualified sense, for it already has existence prior to the reception of the new form. Yet, because in its state of actuality it does not yet have the new form, it can be said to become that being which is characterized by the form it will receive. Hence, matter is a positive principle that perdures throughout the change, and in the new being that results it is one of the co-principles --- the other being the form towards which the matter has a natural affinity.

In our examination of the kinds of opposition we saw that the Marxists conceived of privation as a positive form with real existence in nature. Just as did the ancients, they, too,
had to postulate the real existence of negation (the real existence of absolute non-being) in order to give some kind of explanation of becoming. But this is done at the cost of identifying absolute being with absolute non-being --- a contradiction in terms.

We have to distinguish the absolute non-being of privation from the relative non-being of matter. One of them is a negative principle, and the other is positive. One of them is a term of privative opposition, negating the opposed term; the other is a term of relative opposition, contributing to the natural union between itself and form.

Now we must distinguish matter and privation, and hold that one of these, namely the matter, is non-being only in virtue of an attribute which it has, while the privation in its own nature is not-being; and that the matter is nearly, in a sense is, substance, while the privation in no sense is. They, on the other hand (the Platonists) identify their Great and Small alike with not-being, and that whether they are taken together as one or separately. Their triad is therefore of quite a different kind from ours. For they got so far as to see that there must be some underlying nature, but they make it one --- for even if one philosopher makes a dyad of it, which he calls the Great and Small, the effect is the same, for he overlooked the other nature (the privation). For the one which persists is a joint cause, with the form, of what comes to be --- a mother, as it were. But the negative part of the contrariety may often seem, if you concentrate your attention on it, as an evil agent, not to exist at all.

For admitting with them that there is something divine, good, and desirable, we hold that there are two other principles, the one contrary to it, the other such as of its own nature to desire and yearn for it. But the consequence of their view is that the contrary desires its own extinction. Yet the form cannot desire itself,
for it is not defective; nor can the contrary desire it, for contraries are mutually destructive. The truth is that what desires the form is matter, as the female desires the male and the ugly the beautiful --- only the ugly or the female not per se but per accidens. (188)

This remarkable summary contains the refutation of the Marxist doctrine of dialectical materialism. It points out, first of all, that privation is not a positive term, but is a pure negation. Consequently the Marxist doctrine of conflict in nature is without foundation, since conflict can take place only between positive terms. The second paragraph refutes the Marxist principle that privation is the source of fecundity in the natural world. Privation cannot be the motive power that pushes nature on to new development, for privation is by definition the absence of form. It is matter which has a natural appetite for form, since form is actuality and privation is the absence of actuality. Privation cannot be that which desires form.

The Marxists say that matter, which they call the sole reality in nature, is self-contradictory. Matter, whether found in its highest or lowest forms, is in intrinsic conflict because it contains within itself the negation of the form which it possesses. The negation, they say, is the principle which drives the being on to seek a new form. Thus they identify privation with appetite or matter. (189)

But privation must be distinguished from matter
both by reason of definition and by reason of finality.

By reason of definition it is distinct from matter, since privation is a negative principle of becoming --- it is the absence of the form --- while matter is a positive subject that has the privation. Matter is one of the per se principles that enters into the very constitution of the real being while privation is an extrinsic principle, a principle only of becoming.

Secondly, matter must be distinguished from privation by reason of finality, as Aristotle pointed out in the second paragraph quoted above. The form is a good, a participation in the divine. Privation is the contrary of form, since it is its negation. Matter, on the other hand, is a natural capacity for form. It is impossible that privation desire form, since form is the destruction of privation, yet it is natural that matter do so, since form is the realization of a natural capacity in the matter.

Thus, we have a refutation of all those who in some way or other identify matter and privation: a refutation of the early Greek physicists and Plato who identified them according to definition --- calling matter simply non-being; and a refutation of the Marxists who identified privation with appetite, making privation the source of progress and development.

Prime matter as such is without form, and to
that extent can be called non-being; but privation is nothing more than the absence of a form in a subject capable of having the form, and therefore it is absolutely non-being. Matter enters into the very constitution of real beings; it really exists, though it does not simply exist as a thing. Privation does not enter into the constitution of real beings, but is a principle of becoming.

The Marxists identified matter and privation when they made privation the sole principle of becoming. We call privation one of the principles of becoming because privation is absence of form, and absence or indigence is the first principle of appetite. But this does not constitute privation a tendency towards new forms. Privation is a negative principle of becoming and not a positive one.

Privation cannot desire form, first of all because it is a negation, and secondly, this would entail a desire for self-destruction. Matter, however, seeks form as a good, as a participation of the divine goodness, consequently between matter and form there is not conflict but mutual perfection.

The Marxist philosophy of conflict is, consequently, based upon a logical error; it is based upon the confusion of the opposition of relation with the opposition of privation. Indeed, there is a confusion of the other kinds of opposition also, as we saw in the analysis of opposition, but it is upon this error principally
that the dialectical process is founded: they identify matter and privation. Followed out logically the Marxist error leads to the overthrow of existing government, of the existing economic system, for the negation of these is but the driving onwards to a higher and better form of government and economics.

Privation is a \textit{per se} principle in respect to the coming to be (\textit{fieri}), but an extrinsic principle in relation to the entitative condition of the being. Privation does not enter into the entitative constitution of natural being, for every being is made up of two positive and relative principles, matter and form. A negation cannot contribute positively to being --- though Marxists as well as Hegelians consider negation to be a positive determination of being. Privation is a \textit{per se} principle in reference to becoming. Cause here is not taken as that out of which something is made, that is, as one of the intrinsic causes of being (matter and form); nor is it taken as the extrinsic causes of real being (efficient and final causes), but when we speak of principle in this case we consider it from the point of view of order; all becoming is from the absence of form to the possession of form. Thus, privation is a \textit{per se} principle of becoming, without being one of the four \textit{per se} causes of natural being. (190)

The function of privation is brought out in the example employed by Aristotle when he distinguished matter from
privation. (191) He says that a doctor with black hair becomes gray haired, first of all by reason of his hair, and not by reason of his medical science. Thus hair is the subject which is in potency to receive a new form. And it is because his hair is black that it can become gray. The presence of the color black means that there is a privation of the color gray: there cannot be any becoming if the form is already possessed. Thus, privation is a negative principle of becoming. This example of Aristotle brings out the function of these two principles of natural change, and shows how the one differs from the other, even though both of them are called non-being.

Marxists, however, consider privation as one of the constitutive elements of natural being, for they speak of the intrinsic conflict which results from the union of contradictories. And conflict could not take place unless considered the negation as something positive in the essence of material reality. The logical confusion upon which they built their philosophy is once again apparent.

What the Marxists attempt to explain through privation, the development of higher forms in nature, Aristotle sets down as the function of final cause in nature. It is particularly in the II book of the Physics that he treats of finality. If the dialectical laws were valid there would be no need of invoking this extrinsic cause, for matter would move inexorably through higher and
higher forms. What form matter would take after man Marxist philosophers do not say. The nature of man himself will go through a process of development —– man will make his own nature —– and it is conceivable that this will go on as long as man exists. But Engels spoke of a time when the conscious state of matter will disappear to return with the necessity of the law of negation of negation after some great period of time.

Matter moves in an eternal cycle completing its trajectory in a period so vast that in comparison with which our earthly year is as nothing; in a cycle in which the period of highest development, namely the period of organic life with its crowning achievement self-consciousness, is a space just as comparatively minute in the history of life and of self-consciousness; in a cycle in which every particular form of the existence of matter —– is equally in transition; in a cycle in which nothing is eternal, except eternally changing, eternally moving matter and the laws of its movement and change. But however pitilessly this cycle may be accomplished in time and space, however many countless suns and earths may arise and fall, however long it may be necessary to wait until in some solar system, on some planet appear conditions suitable for organic life, however many countless beings may fall and rise before, out of their midst, develop animals with a thinking brain that find an environment that permits them to live, be it even only for a short period, we are nevertheless, assured that matter in all its changes remains eternally one and the same, that not one of its attributes may perish, and that the same iron necessity which compels the destruction of the highest earthly bloom of matter, the thinking spirit, also necessitates its rebirth at some other place, at some other time. (192)

Aristotle brings in what Marxists deny, an extrinsic principle, directing matter to form as to its good. The word finality when applied to nature has a twofold meaning. There is
one kind of finality in which the natural beings determine their
own actions — this is the case of man in reference to those actions
which are called personal or individual. But for man considered as
part of the natural order as well as for those beings below man that
have not the intelligence to direct their actions to ends they them­
selves choose, there is an external finality, an external direction
of nature by the Author of nature. Thus there is no need of positing
intelligence in every part of nature in order to save the principle
of finality. (193) There must be an intellect directing the movement,
it is true, but this intellect can be either extrinsic or intrinsic to
the being. It is evident that in the philosophy of Marxism there
should be no place for an intellect extrinsic to the world, directing
the universe as a whole as well as those natural beings that have no
intelligence. For Marxism is essentially an atheistic philosophy :
it declares matter the sole reality, and positively denies the
existence of spirit as distinct from matter. The criticism of
classical materialism is sufficient to make this clear — there must
be no dependence on a cause or on an Intelligence outside the world.

In the philosophy of Aristotle nature is
essentially changeable — the very formal object of the science of
nature is mobility. Matter has an appetite for all natural forms,
and this appetite is insatiable because of the limitations of matter:
it can possess only certain, definite forms at one time. To all other natural forms there is privation. Privation or indigence, we saw, is the first principle of appetite for a being that is without the good that is natural to it has a natural tendency towards that good. This usage of the word appetite does not involve necessarily cognition, for it means merely a natural ordering towards those forms which it is capable of receiving. Thus appetite is identical with the nature of matter. (194)

Matter seeks new forms not because it is weary of those possessed, but because of the transcendental relation it has to all natural forms. And even though it is informed by the highest of natural forms, the human form, it still has a capacity and appetite for others. The perfection of matter consists not in the possession of the most perfect form in nature but in its capacity to receive all natural forms. Matter of itself does not have any greater determination towards one than towards the other, but only in so far as it is in more proximate or more remote potency to receive a form. And this potency is determined not by the nature of matter as such but by the degree of disposition that matter has in a given nature. (195)

The matter is not in immediate potency to receive any kind of natural form, but it must go through a series of preparatory forms. (196) Thus, in the philosophy of Aristotle there is place, in principle, for evolution. Matter is in potency to all
natural forms, but matter alone, although real, is not a being having its own existence in nature. The matter must be prepared to receive the higher forms, and once it is sufficiently prepared we say that this particular being in nature has a privation of a certain form --- and from that point on a change to a new form can take place, if all the other causes (extrinsic : efficient and final), as well as the proper intrinsic conditions are present.

Each natural species, it is true, tends toward self-conservation, and to that extent nature has an appetite for stability. This stability, however, is for the good of the individual species. This is the individual nature that Aristotle considers in the second book of the Physics, an intrinsic principle of activity that has a regularity and stability and a certain necessity. This stability, however, is by reason of the form rather than the matter. As Aristotle says, "The form indeed is 'nature' rather than the matter."

The principle of mobility, of instability, of chance is matter as deprived of form. In nature, consequently, we have a double principle : one principle of steadiness which comes from the form and from the matter in so far as they are natures; and a second principle of contingency which comes from the matter as deprived of form. The science of nature must take into account the first, in so far as form and matter are both the constitutive principles of
natural beings and natures.

The Aristotelian view of nature, as to fundamental principles, is a complete one. Based upon observation, it accounts for both the change and the uniformity that common sense attests is present in nature. Aristotelian philosophy calls for a science of nature and says that the foundations of the science (the necessity coming from the form) is objective. At the same time, it admits the limitations of its science because of the contingency that may follow from matter as deprived of form, and because of the instability following upon ever other forms. And the Aristotelian philosophy of nature gives this complete, harmonious view without violating the basic laws of logic, while the explanation of the Marxists is based upon such an error.

There can be but one conclusion from the analysis of Marxist philosophy: judged purely from its principles it is a static philosophy. With all the external expression they give to the philosophy of movement, the philosophy of becoming, they cannot explain real change in nature, because they do not understand the principles of movement in nature. They do not know what privation is; they do not know what matter is. Their observation of nature is generally correct, for nature is mobile, since it has an intrinsic principle of mobility. Yet their intellects do not measure up to the observation of their senses.
Marxist philosophy a static philosophy!

This is, indeed, a hard saying --- for men who want to find a rational explanation of their social philosophy of conflict on their philosophy of nature. The rational grounds for the overthrow of existing social conditions: the capitalistic system of economics, and the governments built upon this system, cannot be found in a philosophy where change is impossible.

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CONCLUSION:

Like every doctrine that attracts great numbers of men, Marxism, too, must have some foundation in truth. Just as man, even in doing evil pursues evil as a good, so in clinging to error, he does so because it has the semblance of truth. The notion of conflict in nature is not without foundation. Indeed conflict is deeply embedded in nature, if we understand correctly the meaning of conflict and the meaning of nature. We can say that conflict is the parent of development, and at the same time give this statement almost the universality that dialectical materialism gives to it. We can give it an even broader extension, for we can admit progress through conflict in the purely spiritual order.

Though the Marxists erred in stating that everything in nature is intrinsically contradictory and when they said that privation is the source of fecundity in the natural world, they were not wrong in their observation both of the world of nature and of human society. Pope Leo XIII's two Letters, "Quadragesimo Anno" and "Divini Redemptoris" recognize the fact of conflict in society, and they realize the part that this conflict had in bringing about the present state of society.

The conflict between good and evil, the sad heritage of original sin, has continued to rage in the world; the tempter of old has never ceased, through his deceiving promises to triumph over the human race. That is why,
in the course of the centuries, we have seen one revolution after another, up until the present revolution --- a revolution which is menacing the whole world and one which by its violence surpasses those suffered by the Church in its early days. (197).

Conflict is and always will be the part of man. It is true that conflict in society is due, to a great extent, to the fallen state of man. But even in a purely natural condition conflict would have been necessary, since not only society, but even the individual man is made up of parts that must be coordinated only through effort. This conflict is but evidence of the imperfection of man's nature.

Conflict, which is not, absolutely speaking, a good in itself, can become an instrument of good; it can be the condition for great progress in the spiritual, in the intellectual and in the physical life of man.

The conflict between the higher and the lower appetite of man is not an absolute good, but it is the condition for progress in virtue. In the intellectual order there is not great development except through conflict. It is by meeting difficulties and overcoming them that the mind gains strength. This is, indeed, one of the reasons why Aristotle proceeded the way he did in the exposition of his philosophy --- he presented the difficulties of the adversaries so that in overcoming them the student might the more
stronly hold to the true doctrine. Teaching which merely gives the student the end product without going over the rough road to reach the truth is not true education. In the physical growth of man conflict is necessary; and the strenuous training of an athlete is a verification of it.

The constant necessity of conflict for an energetic life is evident wherever we turn. Sometimes, however, the conflict does not result to the benefit of the individual, for the negative element may destroy the good. This is the unfortunate condition of those whom temptation finds wanting. Nor does every conflict in the intellectual or physical order turn always to the greater good of the individual. Marxists recognized that not all negation permits the development of a higher form of being, for they declared that in the application of the law of negation, care must be taken to observe all those conditions of the object which make resurgence possible on a higher plane.

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As was pointed out earlier the analysis undertaken in this thesis is not directed against the Historical Materialism of Karl Marx, but against the Dialectics of Nature of his followers. Though involving a conflict of various groups in society, the Historical Materialism of Marx does not involve the
logical confusion upon which the Dialectics of Nature is founded. This latter is open to criticism through purely logical and natural principles, since Marxists have put themselves in a position in which a purely theoretical criticism was possible. They have both declared Dialectics of Nature to be a continuation of the philosophy of the ancient Greeks, and they have claimed that their system is a complete philosophy, as we understand that term.

Through an investigation of the writings of the ancient Greeks we concluded that there could not be anything more than an external similarity between the teaching of the early philosophers and that of the Marxists. And now in this final part we conclude that Marxism, judged from theoretical principles, not only involves contradictions but that it is reducible to a static philosophy.

THE END.
APPENDIX:

(1) We use the adjective or substantive Marxist and the noun Marxism in reference to the common doctrine of dialectical materialism as taught by such theorists as Engels, Lenin and Stalin. On the other hand we use Marxian and Marielianism to refer to that doctrine that is found in Marx' own writings. This latter can be more properly called Historical Materialism, while the former is designated by Dialectics of Nature.

(2) Lenin, Marx-Engels: Marxism, p. 50. For complete data on all books cf. Bibliography.


(4) Lenin, Three Sources of Marxism, Lenin’s Selected Works, V.XI, p. 5.

(5) Stalin, Dialectical and Historical Materialism, p. 21.

(6) Marx, Capital, p. 25.

(7) Marx, Theses on Feuerbach, no. I, quoted in Engels, Ludwig Feuerbach, p. 73.

(8) Ibid., Thesis II, p. 73.

(9) Engels, Ludwig Feuerbach, p. 31.

(10) Plekanov, Questions Fondamentales, p. 11.


(13) Fragment no. 8, quoted by Burnet, Early Greek Philosophy, p. 174.

(14) Cf. Hack, God in Greek Philosophy, p. 60.

(15) Ibid., p. 61.

(16) Ibid., p. 63.


(18) Fragment no. 8, 1. 37-42, Burnet, op. cit., p. 176.

(19) Fragment no. 8, 1. 53-60, Burnet, Ibid., p. 176.
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(20) Fragment no. 9, Burnet, Ibid., p. 176.
(21) Fragment nos. 10 and 11, Burnet, Ibid., p. 177.
(22) Fragment no. 12, Burnet, Ibid., p. 177.
(23) John of St. Thomas, Cur. Theol., T. II, disp. 9, art. 3.
(24) Aristotle, Physics I, c. 2, 185 b 17.
(25) Plekanov, Questions Fondamentales, p. 98.
(27) Aristotle, Physics III, c. 1, 201 b 20.
(28) Fragment no. 8, 1. 42-50, Burnet, op. cit., p. 176.
(29) Fragment no. 8, 1. 26, Burnet, Ibid., p. 175.
(31) Debroglie, Preface to Emile Meyerson's Essais.
(32) Diels, Fragmenta der Vorsokratiker, 19 a 2.
(33) Aristotle, Topics I, c. 1, 100 a 30.
(34) Plato, Sophist, 216 a 3.
(35) Lee, Zeno of Elea, p. 120.
(36) Plekanov, Questions Fondamentales, p. 98.
(37) Zeno's arguments against plurality:

1) Aristotle, Meta. II, c. 4, 1001 b 7:
"Further, if unity-itself is indivisible, it will according
to Zeno's principle be nothing. For what does not make
greater when added nor smaller when subtracted he denies to have
existence at all, on the grounds, clearly, that whatever exists
has spatial magnitude. And if it has spatial magnitude it is
corporeal; for the corporeal has existence in every dimension.
But the other (objects of mathematics), that is plane and line,
will make greater if added in one way, but not if added in an­
other; while point and unit do so in no way whatever".
2) Simplicius, 139. 27 : (Quoted by Lee, Zeno of Elea, p. 13)

"Parmenides had another argument which was thought to prove by means of dichotomy that what is, is one only, and accordingly without parts and indivisible. For, he argues, if it were divisible, then suppose the process of dichotomy to have taken place; then either there will be left certain ultimate magnitudes, which are minima and indivisible, but infinite in number, and so the whole will be made up of minima but of an infinite number of them; or else it will vanish and be divided away into nothing, and so be made up of parts that are nothing. Both of which conclusions are absurd. It cannot therefore be divided, but remains one. Further, since it is everywhere homogeneous, if it is divisible, it will be divisible at another. Suppose it therefore everywhere divides. Then it is clear again that nothing remains and it vanishes, and so that, if it is made up of parts, it is made of parts that are nothing. For so long as any part having magnitude if left, the process of division is not complete. And so, he argues, it is obvious from there considerations that what is indivisible, with our parts, and one".

3) Philoponus, 80. 23 : (Lee, Ibid., p. 13-14)

"His disciple Zeno, in support of his master, tried to prove that what is, is of necessity one and unmoved. He rested his proof of this on the infinite divisibility of any continuum. For, he argued, if what is were not one and indivisible, but were divided into a plurality, nothing would be one in the proper sense (for, if the continuum were divided, it would be divisible ad infinitum); but, if nothing is one in the proper sense, there can be no plurality, if plurality consists of a plurality of units. It is therefore impossible for what if to be divided into a plurality; it is therefore one only. Alternatively the argument may run as follows. If there were no indivisible unity, there could be no plurality, for plurality consists of a plurality of units. Each unit then is either one and indivisible, or itself divided into a plurality. Therefore, if each unit is one and indivisible, the whole is built up of indivisible magnitudes; but if the units are themselves divided, we shall again ask the same question about each of these units that are so divided, and so on ad infinitum. And so the whole will be infinitely many times infinite, if there is a plurality of things that are. But, if this is absurd, then what is, is one only, and it is not possible for there to be a plurality of things that are; for it is necessary to divide each unit an infinite number of times, which is absurd".

Zeno's arguments against motion:

1) Aristotle, Physics VI, c. 9, 239 b 5 :

"Zeno's reasoning, however, is fallacious, when he says that
if everything when it occupies an equal space is at rest, and if that which is in locomotion is always occupying such a space at any moment, the flying arrow is therefore motionless. This is false, for time is not composed of indivisible moments any more than any other magnitude is composed of indivisibles.

Zeno's arguments about motion, which cause so much disquiet to those who try to solve the problems that they present, are four in number. The first asserts the non-existence of motion on the ground that that which is in locomotion must arrive at the half-way stage before it arrives at the goal. This we have discussed above. (233 a 13).

The second is the so-called 'Achilles', and it amounts to this, that in a race the quickest runner can never overtake the slowest, since the pursuer must first reach the point whence the pursued started, so that the slower must always hold a lead. This argument is the same in principle as that which depends on bisection, though it differs from it in that the spaces with which we successively have to deal are not divided into halves. The result of the argument is that the slower is not overtaken. But it proceeds along the same lines as the bisection argument (for in both a division of the space in a certain way leads to the result that the goal is not reached, though the 'Achilles' goes further in that it affirms that even the quickest runner in legendary tradition must fail in his pursuit of the slowest), so that the solution must be the same. And the axiom that that which holds a lead in never overtakes is false; it is not overtaken, it is true, while it holds a lead; but it is overtaken nevertheless if it is granted that it traverses the finite distance prescribed. These then are two of his arguments.

The third is that already given above, to the effect that the flying arrow is at rest, which result follows from the assumption that time is composed of moments; if this assumption is not granted, the conclusion will not follow.

The fourth argument is that concerning the two rows of bodies each row being composed of an equal number of bodies of equal size, passing each other on a race-course as they proceed with equal velocity in opposite directions, the one row originally occupying the space between the goal and the middle point of the course and the other that between the middle point and the starting-post. This he thinks involves the conclusion that half a given time is equal to double that time. The fallacy
of the reasoning lies in the assumption that a body occupies an equal time in passing with equal velocity a body that is in motion and a body of equal size that is at rest, which is false".

Aristotle, Physics VIII, c. 8, 263 a 4:

"The same method should also be adopted in replying to those who ask, in the terms of Zeno's argument, whether we admit that before any distance can be traversed half the distance must be traversed, that these half-distances are infinite in number, and that is impossible to traverse distances infinite in number — or some on the lines of this same argument put the questions in another form, and would have us grant that in the time during which a motion is in progress is should be possible to reckon a half-motion before the whole for every half distance that we get, so that we have the result that when the whole distance is traversed we have reckoned an infinite number, which is admittedly impossible. Now when we first discussed the question of motion we put forward a solution of this difficulty turning on the fact that the period a time occupied in traversing the distance contains within itself an infinite number of units; there is no absurdity, we said, in opposing the traversing of infinite distances in infinite time. And the element of infinity is present in the time no less than in the distance. But, although this solution is adequate as a reply to the questioner (the question asked being whether it is possible in a finite time to traverse or reckon an infinite number of units), nevertheless as an account of the fact and explanation to its true nature it is inadequate. For suppose the distance to be left out of account and the question asked to be no longer whether it is possible in a finite time to traverse an infinite number of distances, and suppose that the inquiry is made to refer to the time taken by itself (for the time contains an infinite number of divisions); then this solution will no longer be adequate, and we must apply the truth that we announced in our recent discussion, stating it in the following way. In the act of dividing the continuous distance into two halves one point is treated as two; since we make it a starting point and a finishing point; and this same result is also produced by the act of reckoning halves as well as by the act of dividing into halves. But if divisions are made in this way, neither the distance nor the motion will be continuous; for motion if it is to be continuous must relate to what is continuous; and though what is continuous contains an infinite number of halves, they are not actual but potential halves. If the halves are made actual, we shall get not a
continuous but an intermittent motion. In the case of reckoning the halves, it is clear that this result follows; for then one point must be reckoned as two; it will be the finishing point of the one half and the starting point of the other, if we reckon not the one continuous whole but the two halves. Therefore to the question whether it is impossible to pass through an infinite number of units either of time or distance we must reply that in a sense it is, and in a sense it is not. If the units are actual, it is not possible; if they are potential, it is possible. For in the course of a continuous motion the traveller has traversed an infinite number of units in an accidental characteristic of the distance to be an infinite number of half-distances, this is not its real and essential character”.

Cf. also: On the Dichotomy
Simplicius, 1013. 4, ad 239b 10 (Quoted by Lee, Zeno of Elea, p. 45).
Simplicius, 947. 5, ad 233 a 21 (Lee, Ibid., p. 45).
Philoponus, 802. 31, ad 233 a 21 (Lee, Ibid., p. 47).
Simplicius, 1289. 5, ad 263 a 5 (Lee, Ibid., p. 49).

On the Achilles:
Simplicius, 1013. 31, ad loc. (Lee, Ibid., p. 51).

On the Arrow:
Simplicius, 1015. 19 ad 239 b 30 (Lee, Ibid., p. 53).
Simplicius, 1011. 19, ad 239 b 5 (Lee, Ibid., p. 53).
Philoponus, 816. 30, ad 239 b 5 (Lee, Ibid., p. 55).

On the Stadium:
Simplicius, 1016. 9—1019. 9, ad loc. (Lee, Ibid., p. 57).

(38) Aristotle, Metaphysics III, c. 4, 1001 b 7; and Physics VI, c. d, 232 b 24.

(39) Aristotle, Physics VI, c. 1, 231 b 15.

(40) Ibid., 231 b 16.

(41) Revue Philosophique, XX, p. 385, Tannery (1885) quoted by Lee, Zeno of Elea, p. 34.

(42) Aristotle, Physics VIII, c. 8, 263 a 5.
(43) Aristotle, Physics VI, c. 2., 233 a 13.
(44) Fragments nos. 24 -- 104, passim, Burnet, op. cit. p. 135-140.
(45) Hack, op. cit., p. 70.
(46) Ibid., p. 74.
(47) Fragments nos. 1-99, passim, Burnet, op. cit., p. 132142.
(49) Hack, Ibid., p. 77.
(51) Hack, op. cit., p. 78-79.
(52) St. Thomas In Metaphysics V, I, XI, no. 912.
(53) St. Thomas, Proemium in Metaphysics.
(54) DeBroglie, Preface to Meyerson’s Essais.
(55) St. Thomas, In Metaphysics I, no. 43.
(56) Ibid., no. 44.
(57) Ibid., no. 45.
(58) Ibid., no. 46.
(59) Fragments nos. 1-148, passim, Burnet, op. cit. 204-226.
(60) Simplicius, Physics 28, 4, Hack, op cit., p. 119.
(61) Theophrastus, Opinions I, Burnet, op. cit., p. 333.
(62) Aristotle, de Gen. et Corr. A, 8, 324 b 35; 315 a 34, Hack, op. cit., p. 120.
(64) St. Thomas, I a, q. 47, a. 2, c.
(65) Arist. Meta. II, c. 1, 993 b 5;

"The investigation of the truth is in one way hard, in another easy. An indication of this is found in the fact that
on one hand is able to attain the truth adequately, while, on the other hand, we do not collectively fail, but every one says something true about the nature of things, and while individually we contribute little or nothing to the truth, by the union of all a considerable amount is amassed. Therefore since the truth seems to be like the proverbial door, which no one can fail to hit, in this respect it must be easy, but the fact that we can have a whole truth and not the particular part we aim at shows the difficulty of it. Perhaps, too, as difficulties are of two kinds, the cause of the present difficulty is not in the facts but in us. For as the eyes of bats are to the blaze of day, so is the reason in our soul to the things which are by nature most evident of all.


(68) Aristotle, Physics II, c. 4, 196 a 25.

(69) Aristotle, Ibid., c. 6, 198 a 5.

(70) Aristotle, de Anima, 403 b 28.


(72) Hack, op. cit., p. 126.


(75) Fragments nos. 1-17, passim, Burnet, op. cit., p. 258-260.

(76) Fragments nos. 12 and 13, burnet, Ibid., p. 259-260.

(77) Aristotle, Metaphysics I, c. 4, 985 a 18.

(78) Plato, Phaedo, nos 97-98.

(79) Adoratsky : Dialectical Materialism, p. 48 :

"The mechanists regard themselves as materialists; but, in fact, because of their inability to think dialectically, they are impotent in the face of idealism and are themselves forced to abandon the materialist position. As an example, one may cite the inability of the mechanists to deal with the question of quantity and quality. This in one of the questions on which the limitations and shortcomings and the metaphysical nature of the mechanistic philosophy are particularly revealed...According to the mechanist conception, the explanation of all phenomena
must be sought in the mechanical motion of qualitatively identical and unchanging units (atoms, electrons). All qualitative differences between things are due to the difference in the composition of these units and to the difference in their simple mechanical motion (transplacement in space). Hence, quality does not exist in actual reality but depends entirely on our subjective perceptions".

(80) Ibid., p. 50 :

"This materialism, which denies the reality of higher forms of motion and reduces everything to gross and simple mechanical motion, to transplacement, proves to be absolutely helpless before idealism. For idealism also asserts that thought and the objective world are identical. Mechanical materialism, therefore, paves the way for idealism of the most subjective kind. It leads to the inevitable conclusion that the only reality is one's own sensations, for however much theoretical thinking may be denied, this reality cannot be denied. Moreover, mechanical materialism cannot resist the idealist belief in a creator, in some force external to the world, for the reason that mechanical materialism cannot explain what it is that sets in motion the gigantic mechanism that the world appears to him to be. The world machine of mechanical materialism requires some external impulse, the universal clock requires somebody to wind it up. There is no way out of this dilemma except to acknowledge the existence of God".

(81) Engels: Ludwig Feuerbach, p. 36-37 :

"The materialism of the last century was predominantly mechanical, because at that time, of all natural sciences, mechanics and indeed only the mechanics of solid bodies --- celestial and terrestrial --- in short, the mechanics of gravity, had come to any definite close.

........... This exclusive application of the standards of mechanics to processes of a chemical and organic nature --- constituted a specific but at that time inevitable limitation of classical French materialism.

The second specific limitation of this materialism lay in its inability to comprehend the universe as a process --- as matter developing in an historical process. This was in accordance with the level of the natural science of that time, and with the metaphysical, i.e., anti-dialectical manner of philosophising connected with it. Nature, it was known, was in constant motion. But according to the ideas of that time, this motion turned eternally in a circle and therefore never moved from the spot; it produced the same results over and over again".
"Cependant à côté et à la suite de la philosophie française du XVIIIe siècle, la philosophie allemande moderne était née et avait trouvé sa conclusion en Hegel. Son plus grand mérite fut le retour à la dialectique comme à la forme supérieure de la pensée. Les philosophes grecs de l'antiquité étaient tous, de naissance, par nature, des dialecticiens et le cerveau le plus universel parmi eux, Aristote, a aussi déjà étudié les formes les plus essentielles de la pensée dialectique. La philosophie moderne, au contraire, bien que la dialectique ait aussi été représentée avec éclat (par exemple par Descartes et Spinoza), fut de plus en plus engagée principalement par une influence anglaise dans le mode de la pensée dite "métaphysique" qui domine aussi presque exclusivement chez les Français du XVIIIe siècle, tout au moins dans leurs travaux spécialement philosophiques".

"And it must be recognised that the latter (Hegelian dialectics) had a great advantage over materialism. It studied thing in their development, in their arising and dying away. If we examine things from precisely this last point of view, the method of thinking characteristic of the encyclopedists,—the transformation of a phenomenon into a fossilised thing by abstracting it from all the inner processes of life, the nature and connection of which it is impossible to understand ---must be rejected. Hegel, the Titan of the XIXe th century idealism, never ceased to fight against this method of thinking. For him "This metaphysic was not free or objective thinking. Instead of letting the object freely and spontaneously expound its own characteristics, metaphysic presupposed it readymade." (Encyc., para. 31)
(91) Hook, From Hegel to Marx, p. 272.
(92) Plekhanov, Questions Fondamentales, p. 30.
(94) Engels, Feuerbach, Appendix D, p. 98.
(95) Riazanov, Marx and Engels, p. 58.
(96) Marx's Theses on Feuerbach: (Jotted down in Brussels in the Spring of 1845.

I. "The chief defect of all hitherto existing materialism --- that of Feuerbach included --- is that the object, reality, sensuousness, is conceived only in the form of the object or contemplation but not as human sensuous activity, practice, not subjectively. Thus it happened that the active side, in opposition to materialism, was developed by idealism --- but only abstractly, since, of course, idealism does not know real sensuous activity as such. Feuerbach wants sensuous objects. Consequently, in the Essence of Christianity, he regards the theoretical attitude as the only genuinely human attitude, while practice is conceived and fixed only in its dirty Jewish form of appearance. Hence he does not grasp the significance of "Revolutionary", of practical-critical, activity.

II. The question whether objective truth can be attributed to human thinking is not a question of theory but is a practical question. In practice man must prove the truth, i.e., the reality and power, the 'this-sidedness' of his thinking. The dispute over the reality or non-reality of thinking which is isolated from practice is a purely scholastic question.

III. The materialist doctrine that men are products of circumstances and upbringing and that, therefore, changed men are products of other circumstances and changed upbringing, forgets that the educator must himself be educated. Hence this doctrine necessarily arrives at dividing society into two parts, of which one towers above society (in Robert Owen, for example).

IV. Feuerbach starts out from the fact of religious self-alienation, the duplication of the world into a religious, imaginary world and a real one. His work consists in the dissolution of the religious world into this secular basis. He overlooks the fact that after completing this work, the chief thing still remains to be done. For the fact that the secular foundation lifts
itself above itself and establishes itself in the clouds as an independent realm is only to be explained by the self-cleavage and self-contradictoriness of this secular basis. The latter must itself, therefore, first be understood in its contradiction and then, by the removal of the contradiction, revolutionised in practice. Thus, for instance, once the earthly family is discovered to be the secret of the holy family, the former must then itself be theoretically criticised and radically changed in practice.

V. Feuerbach, not satisfied with abstract thinking, appeals to sensuous contemplation, but he does not conceive sensuousness as a practical, human-sensuous activity.

VI. Feuerbach resolves the religious essence into the human. But the human essence is no abstraction inherent in each single individual. In its reality it is the ensemble of the social relations. Feuerbach, who does not attempt the criticism of this real essence, is consequently compelled: 1) to abstract from the historical process and to fix the religious sentiment as something for itself and to presuppose an abstract, isolated human individual. 2) The human essence, therefore, can with him be comprehended only as "genus", as a dumb internal generality which merely naturally unites the many individuals.

VII. Feuerbach, consequently, does not see that the "religious sentiment" is itself a social product, and that the abstract individual whom he analyses belongs in reality to a particular form of society.

VIII. Social life is essentially practical. All mysteries which mislead theory to mysticism find their rational solution in human practice and in the comprehension of this practice.

IX. The highest point attained by contemplative materialism, i.e., materialism which does not understand sensuousness as practical activity, is the outlook of single individuals in "civil society".

X. The standpoint of the old materialism is "civil society", the standpoint of the new is human society or socialised humanity.

XI. The philosophers have only interpreted the world in various ways; the point however is to change it".


There cannot be a dialectics of nature:

"Upon the foregoing interpretation, the attempt to apply the dialectic to nature must be ruled out as incompatible with a naturalistic starting point. Marx himself never speaks of a Natur-Dialektik, although he was quite aware that gradual quantitative changes in the fundamental units of physics and chemistry result in qualitative changes Engels, however, in his Anti-Dühring and in his posthumously published manuscript Dialektik und Natur openly extends the dialectics to natural phenomena. His definition of dialectic, however, indicates that he is unaware of the distinctive character of the dialectic as opposed to the physical concept of "Change" and the biological concept of "development". "Dialectic", he writes, "is nothing more than the science of universal laws of motion and evolution in nature human society and thought". (Anti-Dühring, 12 edit. p. 144) Practically all of knowledge, therefore, falls within its scope; and every thinker from Thales down could claim to have in some sense advanced the science of dialectic. Only an idealist can adhere to the distinctive connotation of dialectic expounded above and still believe that nature, independent of man, is an illustration of it.

Galileo's laws of motion and the life history of an insect have nothing to do with dialectic except on the assumption that all nature is spirit. Here as elsewhere, Engels allowed more of Hegel than, as a naturalist, he could properly digest; and one is tempted to say that it kept coming up throughout his work.

Some marxists have so generalised the meaning of dialectics that it refers to the sudden emergence of new qualities in any field. Plechanov, e.g., holds that the transition from 9 to 10, or 90 to 100, in the process of counting is evidence of dialectic at work, (Cr. Fundamental Problems of Marxism, English trans. p. 97). Confusion has arisen because of the multiple and ambiguous references to the term "Natur-Dialektik". Sometimes it means no more than the common place fact that change is
observable in all fields of thought and activity. Sometimes it means that every account of physics must operate with contrasting and complementary principles in order to do justice to the polarities and the oppositions in the structures of nature. But in these senses it is foreign to Marx's conception of dialectic, which is historical and restricted only to a consideration of the causes, nature and effects of human activity that destroys the equilibrium of a polarised society and redetermines the direction of the movement of society. In this last sense, the dialectic is the principle of social activity, its medium is the class struggle. There is no heed to show that there are sudden leaps and jumps in nature to justify revolution in society. Whether natural phenomena are continuous at all points or discontinuous at some is an empirical question. It is strictly irrelevant to the solution of any social problem. The mistaken conception that they are relevant is bound up with a cognate confusion between the truth-character of the findings of science and the social motives and conditions of scientific investigations. The results of physics may be used by the bourgeoisie but there is no such thing as bourgeois physics. To read the class struggle back into science and nature is to imply that all nature is conscious --- a proposition which only an Hegelian idealist can accept."

In an article in The Marxist Quarterly, April-June, 1937, p. 253-293, Mr. Hook gives an analysis of a Dialectic of Nature. Though it is not done exactly along the lines of the analysis we shall make in the final part of this dissertation, the analysis is logical and worth while. He concludes his article with what he considers to be the only possible application of Dialectic to Nature: It has use as a scientific method:

"If we have established anything so far, we have shown that the only sense in which the dialectics is applicable to nature is the sense in which it is an abbreviated synonym for scientific method. And as a confirmation of this conclusion we need only ask of those who deny it, to point to a single case of knowledge discovered by, or explicable in terms of, the dialectic method which cannot be more simply certified by the canons of scientific method. As an additional task we might challenge them to translate the finding of modern science into the language of dialectic and compare the structure of propositions so derived with those of science in respect to verificability, simplicity, systematic connection, and fruitfulness for the acquisition of new knowledge. If the fundamental laws of dialectic, analyzed in the preceding section, are held to be integral to the conception of dialectic,
then it is doubtful whether any translation can be made, for we have seen that these laws violate the fundamental principles of logic, scientific method, and in places, of coherent syntax.

...... We conclude, then, that the dialectic method can claim to have meaning and validity only when it is understood to be synonymous with scientific method; that since its traditional formulation is burdened with many misleading and mistaken conceptions, it would be more conducive to clear thinking if the phrase were dropped: that its retention engenders a mystical philosophy of nature, prepares the way for a doctrine of "two truths," one ordinary, scientific and profane, the other esoteric, "dialectical" and higher; and finally, that it encourages an attitude which easily leads to censorship, dictation, and persecution of scientists.


(105) Ibid., p. 6.


(107) Engels, Feuerbach, p. 56:

"But above all, there are three great discoveries which had enabled our knowledge of the inter-connection of natural processes to advance by leaps and bounds: first, the discovery of the cell as the unity from whose multiplication and differentiation the whole plant and animal body develops..... Second, the transformation of energy, which has demonstrated that all the so-called forces operative in the first instance in inorganic nature --- mechanical force and its complement so-called potential energy, Heat, radiation (light or radiant heat), electricity, magnetism and chemical energy --- are different forms of manifestation of universal motion, which pass into one another in definite proportions so that in place of a certain quantity of the one which disappears, a certain quantity of another makes its appearance and thus the whole motion of nature is reduced to this incessant process of transformation from one form into another. Finally, the proof which Darwin first developed in connected form that the stock of organic products of nature surrounding us today, including mankind, is the result of a long process of evolution from a few original unicellular germs, and that these again have arisen from protoplasm or albumen which came into existence by chemical means".

(108) Engels Feuerbach, p. 56.

(109) Stalin has summed up the differences between the two ways of thinking. Stalin: Dialectical and His materialism, p. 7.

The essence of the dialectical method:

"The principal features of the Marxist dialectical method are as follows:

a) Contrary to metaphysics, dialectics does not regard nature as an accidental agglomeration of things, of phenomena, unconnected with, isolated from, and independent of, each other, but as a connected and integral whole, in which things, phenomena, are organically connected with, dependant on, and determined by each other.

The dialectical method therefore holds that no phenomenon in nature can be understood if taken by itself, isolated from surrounding phenomena, inasmuch as any phenomenon in any realm of nature may become meaningless to us if it is not considered in connection with the surrounding conditions, but divorced from them; and that, vice versa, any phenomenon can be understood and explained if considered in its inseparable connection with surrounding phenomena, as one conditioned by surrounding phenomena.

b) Contrary to metaphysics, dialectics holds that nature is not a state of rest and immobility, stagnation and immutability, but a state of continuous movement and change, of continuous renewal and development, where something is always arising and developing, and something always disintegrating and dying away.

The dialectical method therefore requires that phenomena should be considered not only from the standpoint of their interconnection and interdependence, but also from the standpoint of their movement, their change, their development, their coming into being and going out of being.

The dialectical method regards as important primarily not that which at the given moment seems to be durable and yet is already beginning to die away, but that which is arising and developing, even though at the given moment it may appear to be not durable, for the dialectical method considers invincible only that which is arising and developing.

c) Contrary to metaphysics, dialectics does not regard the process of development as a simple process of growth, where quantitative changes do not lead to qualitative changes, but as a development which passes from insignificant and imperceptible
quantitative changes to open, fundamental changes, to qualit­
tive changes; a development in which the qualitative changes
occur not gradually, but rapidly and abruptly, taking the form
of a leap from one state to another; they occur not accidentally
got as the natural result of an accumulation of imperceptible
and gradual quantitative changes.

The dialectical method therefore holds that the process of
development should be understood not as movement in a circle, not
as a simple repetition of what has already occurred, but as an
onward and upward movement, as a transition from an old qualitative
state to a new qualitative state, as a development from the simple
to the complex, from the lower to the higher.

d) Contrary to metaphysics, dialectics holds that internal contrad­
dictions are inherent in all things and phenomena of nature,
for they all have their negative and positive sides, a past
and a future, something dying away and something developing; and
that the struggle between these opposites, the struggle between
the old and the new, between that which is dying away and that
which is being born, between that which is disappearing and that
which is developing, constitutes the internal content of the
process of development, the internal content of the transformation
of quantitative changes into qualitative changes.

The dialectical method therefore holds that the process of
development from the lower to the higher takes place not as a
harmonious unfolding of phenomena, but as a disclosure of the
contradictions inherent in things and phenomena, as a "struggle"
of opposite tendencies which operate on the basis of these
contradictions.

In its proper meaning' Lenin says, 'dialectics is the study
of the contradiction within the very essence of things.'

(110) Engels, Anti-Dühring, I, p. 11.


(112) Engels, Anti-Dühring I, p. 181; cf. also Plekanov, Questions
fondamentales, p. 98.

(113) Adoratsky, Dialectical Materialism, p. 28.

(114) Engels, Anti-Dühring, p. 183;
cf. also : Engels, Dialectics of nature, p. 164 :
"Already no physiology is held to be scientific if it does
not consider death as an essential factor of life (Note : Hegel,
Ency. I, p. 152-5). The negation of life as being essentially
contained in life itself, so that life is always thought of in
relation to its necessary result, death, which is always
tained in it in germ. The dialectical conception of life
is nothing more than this. But for anyone who has once un­
stood this, all talk of the immortality of the soul is done
away with... Here therefore by means of dialectics, simply
becoming clear about the nature of life and death suffices to
abolish an ancient superstition. Living means dying".

(115) Engels, Anti-Duhring, p. 74 :
"Le mouvement est le mode d'existence, la manière d'être
de la matière. Jamais et nulle part, il n'y a eu et il ne peut
y avoir de matière sans mouvement. Mouvement dans l'espace
céleste, mouvement mécanique de masses plus petites sur chacun
des corps célestes vibration moléculaire sous forme de chaleur,
de courant électrique ou mathétique, analyse et synthèse chi­
niques, vie organique, c'est dans l'une ou l'autre de ces for­
mes du mouvement ou dans plusieurs en même temps que se trouve
chaque atome de matière dans le monde à chaque instant donné.
Tout repos, tout équilibre n'est que relatif, et n'a de sens
que par rapport à telle ou telle forme déterminée de mouvement.
Un corps peut, par exemple, se trouver à la surface de la terre
en équilibre mécanique, être au point de vue mécanique en état
de repos : cela ne l'empêche aucunement de participer au mouve­
ment de la terre ainsi qu'à celui du système solaire tout entier,
pas plus que cela n'empêche ses particules physiques les plus
petites d'accomplir les vibrations conditionnées par sa tempé­
rature, ou ses atomes matériels d'effectuer un processus chimi­
que. La matière sans mouvement est tout aussi inconcevable que
le mouvement sans matière. Le mouvement ne peut par conséquent,
pas plus être créé ou détruit que la matière elle-même, ce que
l'ancienne philosophie (Descartes) exprime en disant que la
quantité de mouvement existant dans le monde est toujours
constante".

(117) Ibid., p. 231.
(118) Engels, Feuerbach, p. 54: cf. also Lenin, Empirio-Criticism,
(119) Hegel, The Science of Logic, p. 264, n. 145 :
"When narrowly examined, free choice is seen to be a
contradiction, to this extent that its form and content stand in
antithesis. The matter of choice is given, and known as a
content of dependent not on the will itself, but on outward
circumstances. In reference to such a given content, freedom
lies only in the form of choosing, which, as it is only a freedom in form, may consequently be regarded as freedom only in supposition. On an ultimate analysis it will be seen that the same outwardness of circumstances, on which is founded the content that the will finds to its hand, can alone account for the will giving its decision for the one and not the other of the two alternatives.

Ibid., p. 282, n. 158:

"Necessity, indeed qua necessity is far from being freedom; yet freedom pre-supposes necessity, and contains it as an un-substantial element in itself. A good man is aware that the tenor of his conduct is essentially obligatory and necessary. But this consciousness is so far from making any abatement from his freedom, that without it real and reasonable freedom could not be distinguished from arbitrary choice, --- a freedom which has no reality and is merely potential. A criminal, when punished, may look upon his punishment as a restriction of his freedom. Really the punishment is not foreign constraint to which he is subjected, but the manifestation of his own act: and if he recognises this, he comports himself as a free man. In short, man is most independent when he knows himself to be determined by the Absolute Idea throughout".


(121) Engels, Dialectics of Nature, p. 182:

"The law of identity in the old metaphysical sense is the fundamental law of the old outlook: A equals A. Each thing is equal to itself. Everything was permanent, the Solar system, Stars, organisms. This law has been refuted by natural science bit by bit in each separate case, but theoretically it still prevails and is still put forward by the supporters of the old in opposition to the new: a thing cannot simultaneously be itself and something else. And yet the fact that true, concrete identity includes difference, change, has recently been shown in detail by natural science. Abstract identity, like all metaphysical categories, suffice for everyday use, where small scale conditions or brief periods of time are in question; the limits within which it is usable differ in almost every case and are determined by the nature of the object".

(122) Plekanov, Questions Fondamentales, p. 99.

(123) Marxists, think they have found in what they call "higher mathematics" a verification of the fundamental law of dialectics, the unity of opposites. Engels compares higher mathematics to simple computation as dialectical logic is compared to Aristotelian logic. The reason for the application of dialectical
principles to mathematics is that higher mathematics, using the principles of calculus, works with progressions towards mathematical infinity. This progression is a movement. No movement can be accurately described in terms of Aristotelian logic, for this logic abstracts from movement.

Just as Engels considered real movement in nature a contradiction, so he considers the mathematical movement or progression towards infinity a contradiction. Just as in real movement in Nature he considered the terminus a quo to be identical with the terminus ad quem, to be identical because they were found in the one real, concrete being, so here he considers the terminus a quo of the mathematical progression towards infinity to be identical with the terminus ad quem. In nature such an identification is a contradiction; so it is here.

Engels does not distinguish the real movement of things in Nature from the logical progression towards infinity in mathematics -- both are considered equally real, at least for the purposes of exemplifying the dialectical laws. As in Nature there is a real identification and simultaneous presence of contradictory elements, so in the mathematical progression the limit is actually considered to be reached during the progression, and so the terminus a quo and the terminus ad quem are simultaneously verified.

In the following quotations the character of mathematical dialectics will be brought out.

Engels, Anti-Dühring, p. 207:
"La mathématique élémentaire, la mathématique des grandeurs constantes, se meut dans les cadres de la logique formelle, au moins en général et en gros; la mathématique des grandeurs variables, dont la partie la plus importante est le calcul infinitésimal, n'est pas essentiellement autre chose que l'application de la dialectique aux questions mathématiques. La simple préoccupation de prouver s'efface ici décidément devant les applications multiples de la méthode à de nouveaux domaines de recherche".

Ibid., p. 185:
"Nous avons déjà noté que les mathématiques supérieures ont au nombre de leurs bases fondamentales la contradiction selon laquelle droite et courbe doivent être en certains cas identiques. Elles réalisent cette autre contradiction que des lignes qui se coupent sous nos yeux doivent pourtant, des cinq ou six centimètres à partir de leur intersection, passer pour des parallèles,
pour des lignes qui, même prolongées à l'infini, ne peuvent se couper. Et pourtant les mathématiques supérieures fournissent avec ces contradictions et avec d'autres encore plus fortes, des résultats non seulement exacts mais tout à fait impossibles à atteindre pour les mathématiques inférieures.

Mais celles-ci même fournissent déjà des contradictions. Par exemple, c'est une contradiction qu'une racine de $A$ doive être une puissance de $a$: et pourtant $A^{\frac{1}{2}} = \sqrt{A}$. C'est une contradiction qu'une grandeur négative soit le carré d'elle-même, donne un carré positif. La racine carrée de moins un est donc, non seulement une contradiction, mais même une contradiction absurde, un véritable non-sens. Et pourtant $\sqrt{-1}$ est de beaucoup de cas le résultat nécessaire d'opérations mathématiques exactes; bien plus, ou en seraient les mathématiques, les inférieures aussi bien que les supérieures, s'il leur était interdit d'opérer avec $\sqrt{-1}$.

Les mathématiques elles-mêmes pénètrent, en opérant sur les grandeurs variables, sur le terrain dialectique, et, chose significative, c'est un philosophe dialecticien, Descartes, qui a introduit ce progrès chez elles. Ce que la mathématique des grandeurs variables est à celle des grandeurs invariables la pensée dialectique l'est, en somme, à la pensée métaphysique. Ce qui n'empêche aucunement la grande majorité des mathématiciens de ne reconnaître la légitimité de la dialectique que dans le domaine mathématique, et un assez bon nombre d'entre eux de se servir des méthodes obtenues par voie dialectique pour opérer ensuite selon la vieille manière bornée et métaphysique.

An example from another Marxist: Plekanov, Essays in the History of Materialism, p. 169:

"In lower mathematics conceptions are strictly limited and separated from one another as though by an abyss: a polygon is a polygon and nothing else: a circle is a circle and nothing else. But even in plane geometry we are compelled to apply the so-called method of limits which shakes our respected and immovable conceptions and in the most astonishing way brings them into proximity with one another. How can it be proved that the area of a circle is equal to the product of the circumference and half the radius. It is said: the difference between the area of a true polygon inscribed in a circle and the area of this circle can be made an arbitrarily small quantity on condition that the number of its sides is sufficiently increased. If the area of the circle, the circumference, the diameter of a true polygon inscribed in a circle are consecutively known by $\pi$, $p$, and $r$, then $a$ equals $p$ times $\frac{\pi}{2} r$; while $a$ and $p$ times $\frac{\pi}{2} r$ are quantities which change together with the number of sides but are
always equal between themselves; their limits will therefore also be equal, if we consecutively name the area, circumference and radius of a circle $A$, $C$ and $R$. Then $A$ is the limit of $a$; $C$ the limit of $p$; and $R$ the limit of $r$; therefore $A$ equals $C$ times $\frac{1}{2} r$. Thus the polygon is transformed into a circle; so the circle is examined in the process of its becoming. This already represents a remarkable revolution in mathematical conceptions. Higher analysis takes this revolution for its starting point. Differential calculus has to do with infinitely small quantities or, in Hegel's words, "It has to do with quantities which are in the process of disappearing, not before their disappearance, for then they would be finite quantities, and not after their disappearance, for then they would not exist".

Plekanov has quoted from Hegel's *Wissenschaft der logik*, Nürnberg, 1812, 1, Bd. 1, p. 42.

The error of the Marxists consists in presupposing that the limit of a variable can actually be reached, and that the infinitely small is a pure actuality or a pure negation.


(126) Engels, *Anti-Dühring*, p. 204:

Marx démontre simplement et résume ici brièvement ceci: "De même que la petite industrie engendra par sa propre évolution les conditions de sa destruction, c'est-à-dire, de l'expropriation des petits propriétaires, et cela nécessairement de même aujourd'hui le mode de production capitaliste a lui-même engendré les conditions matérielles dont il doit mourir. Ce processus est un processus historique, et s'il est en même temps un processus dialectique, ce n'est pas la faute de Marx, quelque désagréable que cela soit à M. Dühring.

C'est seulement après avoir mené à bonne fin sa démonstration historique et économique que Marx continue: "Le système d'appropriation capitaliste découlant du mode de production capitaliste, et par suite la propriété privée capitaliste, constituent la première négation de la propriété privée individuelle fondée sur le travail personnel. Mais la fatalité d'un procès naturel, la production capitaliste engendre sa propre négation. C'est la négation de la négation."

Ainsi quand Marx qualifie cette suite de faits de "négation de la négation", il ne songe pas à en prouver par ce moyen la nécessité historique. C'est le contraire: quand il a prouvé par l'histoire qu'en fait la chose s'est en partie produite et en
partie doit se produire encore, il le désigne en même temps comme un phénomène qui s'accomplit selon une loi dialectique déterminée. C'est tout'.

Cf. Ibid., p. 214 ssq.

(127) Ibid., p. 219.

(128) Ibid., p. 209.

(129) Ibid., p. 220.


(132) Hegel, Science of Logic, p. 313-314, t. I, Nürnberg, 1812. "Quand on veut se représenter l'apparition ou la disparition de quelque chose, on se les représente ordinairement comme une apparition ou une disparition graduales. Pourtant les transformations de l'être sont non seulement le passage d'une quantité à une autre, mais aussi le passage de la quantité à la qualité et inversement, passage qui, entraînant la substitution d'un phénomène à un autre, est une rupture de la progressivité....

A la base de la doctrine de la progressivité se trouve l'idée que ce qui surgit existe déjà effectivement, et reste imperceptible uniquement à cause de sa petitesse. De même, quand on parle de disparition graduelle d'un phénomène, on se représente que cette disparition est un fait accompli, et que le phénomène qui prend la place du phénomène précédent existe déjà, mais qu'ils ne sont encore perceptibles ni l'un ni l'autre.... Expliquer l'apparition ou la disparition d'un phénomène donne par la progressivité de la transformation, c'est tout ramener à une tautologie fastidieuse, car c'est considérer comme prêt d'avance (c'est-à-dire comme déjà apparu ou bien comme déjà disparu) ce qui est en train d'apparaître ou de disparaître".

(Quoted by Plekanov, Questions fondamentales, p. 32.

(133) Engels, Anti-Dühring, I, p. 94.


(135) Marx, Critique of political Economy, Selected Works I, p. 356.

(136) Engels, Feuerbach, p. 58.
The order of opposition according to being:

Cajetan in Praedicamenta: de postpraedicamentis, p. 85:

"Si autem in ordine entium collogandae sunt, sic contrarius ordo est quoniam relative oppositioni primus debetur locus, contraria secundus, privativa tertius et contradictoriae quartus; et ratio est quia in his quae imperfectionem importat, opposito ordine attenditur magis et minus eorum in illo genere et in genere entis, in illo siquidem genere attenditur magis et minus secundum accessum ad summum illius generis vel quod idem est secundum maiorem recessum ab opposito. In genere autem entis attenditur magis secundum minorem recessum ab entis positione, ita quod illud est perfectius quod minus ab entis positione recedet, verbi gratia infirmatas quae imperfectionem sonat, dupliciter melior dici potest vel in genere infirmitatis, et sic illa erit perfectior infirmitas, quae magis appropinquat morti seu magis recedit a sanitate, vel in genere entis, et sic infirmitas minus removens sanitatis perfectior est.

Constat autem quod oppositio in allastogia malorum est, sicut non ens et distinctio ut ex oppositis eorum apparent, scilicet convenientia et unitate quae in coordinatione bonorum sunt: et ideo consequens est quod quanto aliqua oppositio magis recedit ab enti positione, posteriorem inter entia locum tenet, et ea quae minus entitatis removet, priorem locum obtinet. Clarum vero est quod convenientia ens ponit, sicut et unum esse, et consequenter quod quanto aliqua oppositio minus convenientiae habet, tanto magis ab ente recedit; ac per hoc contradictio ultimum entium enter oppositiones erit et aliae praecedent ipsam secundum recessum minorem a conventia, qui supra declaratus est".

Cajetan in postpraedicamenta, p. 84:

Circa illud verbum "quadrupliciter opponi dicitur" adver...
citer ordo inter eas considerari potest, primo in latitudine oppositionis, secundo in latitudine entis. Si ordinandae sunt in ordine oppositionum, sic contradictio primum tenet locum, deinde privatio, terciio contrarietas, et ultimo relativa opposition remanet, quia tanto prörem inter oppositionem locum obtinet oppositio quanto minus frigoris compatitur, et universaliter quanto minus unum extremum ponatitur aliquid alterius, tanto magis perfectius secundum illud est. Constat autem contradictio extremas in nullo convenire, quia alterum ens, alterum nihil est. Privative autem opposita etsi in nullo formaliter conveniant, in subjecti tamen positione conveniunt quoniam utrumque eorum ens ponit, formaliter illius generis tertium merito sibi locum vindicant. Relative autem opposita ultimo restant, quoniam in genere formaliter conveniunt, utpote naturas positivas illius dicentia, nec se ex hoc quod relative opposita sunt expellunt, ut infra patebit, sed quia opposita, id est contraposita, sunt inter opposita numerantur".

(142) Aristotle, Categories c. 7, 6 a 35.

(143) Ibid., c. 10, 11 b 25.

(144) St. Thomas de Potentia, q. 7, art. 8, ad 4: "Ad quartum dicendum quod oppositio relationis in duobus differt ab aliis oppositionibus: quorum primum est quod in aliis oppositis unum dicitur alteri opponi, in quantum ipsum removet: negatio enim removet affirmationem, et secundum hoc ei opponitur; oppositio vero privationis et habitus et contrarietas includit oppositionem contradictionis, ut IV Meta. dicitur. Non autem est hoc in relativis".

(145) Aristotle, Categories, c. 7, 7 b 15.

(146) John of St. Thomas, Logic II, q. 2, art. 1, p. 289 a 15.

(147) St. Thomas, De Potentia, q. 8, art. 1, ad 13: "Dicendum quod in aliis oppositionibus semper alterum est ut imperfectum vel non ens, vel ut habens aliquid de non ente: negatio enim est non ens, et privatio est quaedam negatio, et duorum contrarium alterum semper habet aliquid privationis; unde aliae oppositiones in Deo esse non possunt situt oppositio relationis, quae ex neutra parte importat imperfectionem".

(148) In the transcendental relationship of matter to form, it seems that the two terms of the relation limit each other, so that it is not true to say that the limitation of the terms of opposition of relation comes only from the definition of the term, and not from a negation imposed on it by its opposite. It is commonly said that form is limited by matter, hence there seems to be a
negation on the part of the matter. This would be valid if the definition of form could abstract from matter, but as a matter of fact it is absolutely impossible to define any natural form except in relation to matter. Every natural form is always a corporeal form by essence. Therefore the limitation is present in the very definition of natural form. There is a natural limitation on the part of signified matter — matter under quantity — according to which the numerically distinct natural forms are limited. The natural forms of one and the same species are limited by the number of quantitative subjects that can receive these forms — but this is not a limitation of form as form, but only a limitation as to real existence of this form. In other words, there is no essential limitation of form by matter, but only an accidental limitation, i.e., according to existence — which is accidental.

(149) John S. Thomae, Cursus Philosophicus, Logic II, q. 17, art. 2, p. 578 a 25:

"Ex his non erit difficile discernere inter relationes secundum dici et secundum esse, reales et rationis. Relativa enim SECUNDUM ESSE et SECUNDUM DICI discriminantur ex ipso exercitio, quia in relativis secundum esse tota ratio secundum esse septem terminum in ratione puri termini, Exercitium vero secundum dici relationis secundum dici non est pure respicere terminum, sed aliquid aliud exercere, unde sequatur relatio; ideoque dixit bene S. Thomas in II dist., i q. 1, art. 5 ad 8, primo loco positum, quod ista relativa important fundamentum et relationem, relativa vero secundum esse tantum relationem dicunt, quia videlicet relationem dicunt, quia videlicet relativa secundum dici potius erga germinum se habent fundando relationem quam actu respiciendo, et ideo non in ratione puri termini ipsum respiciunt, sed secundum aliam rationem, puta causae vel effectus aut obiecti, aut quid simile. Quapropter relatio secundum dici in hoc perpetuo distinguuntur a relatione secundum esse ex D. Thoma, quod principale significatum relationis secundum dici non est relatio, sed aliquid aliud, ad quod sequitur relatio. Quando autem principale significatum aliquis est relatio ipsa et non aliquid absolutum, tum est relatio secundum esse, ut constat ex I, q. 13, art; et in I dest., 30, a; et opusc. 48 tract. de praedicament:"

(149) Ex hoc etiam constat, quod relatio transcendentalis, quae non est alia a relatione secundum dici, non importat ex principali significato relationem, sed aliquid absolutum, ad quod sequitur vel sequi potest aliqua relatio. Nam si absolutum non importat, transcendentalis non erit, id est vagans per diversa genera, sed ad unum praedicamentum tantum spectabit. Unde relatio transcendentalis non est forma adveniens subiecto seu rei absolutae,
sed illi imbibita, connotans tamen aliquid extrinsecum, a quo pendet vel circa quod versatur, ut materia ad formam, caput ad capillum, creatura ad Deum, sicque relatio transcendentalis coincidit cum relatione secundum dici. Et male ab aliqua quibus relatio secundum esse dividit in transcendentalem et praedicamentalem, cum transcendentalis sit in ipsa entitate absoluta nec ab eius esse dierat, et sic non sit totum suum esse ad aliud, quod requiratur ad relationem secundum esse".

(150) John of St. Thomas, Curs. Phil., Logic II, q. 17, art. 2, p. 579 a 5:
"Relationes autem reales et rationis, quae divisio solum in relatione secundum esse invenitur, discriminaruntur penes ca- rentiam aliquius ex conditionibus requisitis ad relationes reales. Requiruntur autem quinque conditiones a D. Thoma, Opusc. 48, tract. de Relativis, cap. 1 : duas ex parte subiecti, duas ex parte termini, una ex parte relatorum. Ex parte subiecti, quod subiectum sit ens realis et fundamentum seu rationem fundandi realarem habet. Ex parte termini, quod terminus sit res aliqua realis et realiter existens, et secundo, quod sit distincta realiter ab alio extremit. Ex parte vero relativorum, quod sit eiusdem ordinis, defectu cuius Dei ad creaturam non est relatio realis nec mensurae ad mensuratum, si sit diversi ordinis. Formaliter tamen et principaliter reducitur tota differentia inter relationem realem et rationem, quod relatio realis habet fundamentum realarem cum co-existentia termini, relatio rationis caret fundamento, ut ex D. Thoma sumitur, I ad Annibalum, dist. 30, quas. unica, art. 1. Ad hoc ut relatio aliqua sit praedicamentoalis, requiritur, quod habet illas conditiones, quibus distinguatur a relatione rationis et transcendentali sive secundum dici, ideoque definitur relatio praedicamentalis, quod sit formal realis, cuius totum esse est ad aliud. Per primam particulam distinguuntur a relatione rationos, quae realis forma non est, per secundum a relationem transcendentalem et quolibet absoluto, cuius totum esse non est ad aliud, cum in se etiam absolutum aliquid sit. Colliguntur vero tres conditiones relationis praedicamentalis : Prima, quod sit relatio secundum esse; secunda, quod sit realis, ubi includimus omnes conditiones requisitas ad relationem realem; tertia, quod sit finita".


(152) Aristotle, Metaphysics V, c. 10, 1018 a 20:
"The term 'opposite' is applied to contradictories, and to contraries, and to relative terms, and to privation and possession, and to the extremes from which and into which generation and dissolution take place; and the attributes that cannot be
present at the same time in that which is receptive of both, are said to be opposed --- either themselves or their constituents. Gray and white colour do not belong at the same time to the same thing; hence their constituents are opposed.

The term 'contrary' is applied 1) to those attributes differing in genus which cannot belong at the same time to the same subject, 2) to the most different of the things in the same genus, 3) to the most different of the attributes in the same recipient subject, 4) to the most different of the things that fall under the same faculty, 5) to the things whose difference is greatest either absolutely or in genus or in species".

(153) Each contrary has only one contrary, because the contraries are those terms which are separated by the greatest difference. But contraries admit of degrees in between these extremes, for they have a medium, since they are generically the same, though not specifically.

Aristotle, Metaphysics X, c. 4, 1055 a 5 : "Since things which differ may differ from one another more or less, there is also a greatest difference, and this I call contrariety. That contrariety is the greatest difference is made clear by induction. For things which differ in genus have no way to one another, but are too far distant and are not comparable; and for things that differ in species the extremes from which generation takes place are the contraries, and the distance between extremes -- and therefore that between the contraries -- is the greatest...

This being so, it is clear that one thing cannot have more than one contrary (for neither can there be anything more extreme than the extreme, nor can there be more than two extremes for the one interval), and, to put the matter generally, this is clear if contrariety is a difference, and if difference, and therefore also the complete difference, must be between two things.

And the other commonly accepted definitions are also necessarily true. For not only is 1) the complete difference the greatest difference (for we can get no difference beyond it of things differing either in genus or in species; for it has been shown that there is no 'difference' Between anything and the things outside its genus, and among the things which differ in species the complete difference is the greatest); but also 2) the things in the same genus which differ most are contrary (for the complete difference is the greatest difference between species of the same genus); and 3) the things in the same receptive material which differ most are contrary (for the matter is the
same for contraries); and 4) of the things which fall under
the same faculty the most different are contrary (for one
science deals with one class of things, and in these the
complete difference is the greatest)".

(154) St. Thomas, Comm. in V Meta., no. 925:
"Deinde cum dicit "contraria dicuntur", hic ostendit quot
modis contraria dicuntur; et circa hoc tria facit. Quorum pri-
num est, quod assignat modos, quibus aliqua principaliter di-
cuntur contraria; inter quos ponit unum primum improprium; sci-
licet quod aliqua dicuntur contraria, quae non possunt simul ad
esse eadem, licet different seccundum genem; propria enim contra-
ria sunt quae sunt unius generis, sicut si diceretur, quod gra-
vitas et motus circularis non sunt in eodem sujebto".

(155) Aristotle, Categories, c. XI, 14 a 15:
"It is plain that contrary attributes must needs be present
in subject which belong to the same species or genus. Disease
and health require as their subject the body of an animal;
white and black require a body, without further qualification;
justice and injustice require as their subject the human soul".

Cf. also Cajetan in Post. Praed. p. 102:
"Hic ponitur quinta conditio contrariorum talis; omnia
contraria aut sunt in eodem genere aut in contrariis generibus,
aut sunt genera contrariorum; et declarat singulas particular
singulis exemplis, ut clare patet. Loquitur autem non de genere
physico, id est sujebto, de quo locutus est in quarta conditio-
ne, sed de genere logico, id est prae dicabili in quid.
Quod vero dixit : bonum et malum esse genera contrariorum,
ut S. Thomas in I qua. de Malo ex Simplicio refert, quadrupli-
citer exponitur. Primo a quibusdam sic : bonum et malum sunt
genera contrariorum scilicet virtutis et vitii, et non sunt in
genere, scilicet contrario, id est non sunt in contrariis ge-
neribus, sed in qualitate. Sed haec expositio non videtur con-
sona textui, in quo fiunt tria membra, quum tertium coincideret
cum primo nisi aliqua limitatio ibi addatur. Propter quod Por-
phyrius distinxit contraria in univocu et equivoqua, et dixit
univoqua aut esse in eodem genere proximo, ut album et nigrum sub
colore, aut esse in contrariis generibus proximis, ut castitas
et impudicitia sub virtute et vitii, cum tamen sint in uno ge-
nerre remoto, scilicet prima specie qualitatis. Aequivoca vero
nee esse in uno genere nec in pluribus, ded omnia genera cir-
cuire, et properea aliorum genera esse eo modo quo transcenden-
tia genera vocantur; et haec sunt bonum et malum."

(156) Aristotle, Metaphysics V, c. 10, 1018 a 30.
(157) Aristotle, Categories, c. 11, 14 a 15:

"That the contrary of a good is an evil is shown by induction: The contrary of health is disease, of courage, cowardice, and so on. But the contrary of an evil is sometimes a good, sometimes an evil. For defect, which is an evil, has excess for its contrary, this also being an evil, and the mean, which is a good, is equally the contrary of the one and of the other. It is only in a few cases, however, that we see instances of this: in most, the contrary of an evil is a good.

In the case of contraries, it is not always necessary that if one exists the other should also exist: for if all become healthy there will be health and no disease, and again, if everything turns white, there will be white, but no black. Again, since the fact that Socrates is ill is the contrary of the fact that Socrates is well, and two contrary conditions cannot both obtain in one and the same individual at the same time, both these contraries could not exist at once: for if that Socrates was well was a fact, then that Socrates was ill could not possibly be one.

It is plain that contrary attributes must needs be present in subject which belong to the same species or genus. Disease and health require as their subject the body of an animal; white and black require a body, without further qualification; justice and injustice require as their subject the human soul.

Moreover, it is necessary that pairs of contraries should in all cases either belong to the same genus or belong to contrary genera or be themselves genera. White and black belong to the same genus, colour; justice and injustice, to contrary genera, virtue and vice, while good and evil do not belong to genera, but are themselves actual genera, with terms under them".

(158) Aristotle, Metaphysics, c. 7, 1057 a 16:

"Since contraries admit of an intermediate and in some cases have it, intermediates must be composed of the contraries. For 1) all intermediates are in the same genus as the things between which they stand. For we call those things intermediates, into which that which changes must change first; e.g. if we were to pass from the highest string to the lowest by the smallest intervals, we should come sooner to the intermediate notes, and in colours if we were to pass from white to black, we should come sooner to crimson and grey than to black; and similarly in all other cases. But to change from one genus to another genus is not possible except in an incidental way, as from colour to figure. Intermediates, then, must be in the same genus both as one another and as the things they stand between.

But 2) all intermediates stand between opposites of some
kind; for only between these can change take place in virtue of their own nature (so that an intermediate is impossible between things which are not opposite; for then there would be change which was not from one opposite towards the other). Of opposites, contradictories admit of no middle term; for this is what contradiction is—an opposition, one or other side of which must attach to anything whatever, i.e. which has no intermediate. Of other opposites, some are relative, others privative, others contrary. Of relative terms, those which are not contrary have no intermediate; the reason is that they are not in the same genus. For what intermediate could there be between knowledge, and knowable? But between great and small there is one.

3) If intermediates are in the same genus, as has been shown, and stand between contraries, they must be composed of these contraries. For either there will be a genus including the contraries or there will be none. And if a) there is to be a genus in such a way that it is something prior to the contraries, the differentiae which constituted the contrary species of a genus will be contraries prior to the species; for species are composed of the genus and the differentiae... But, again, the species which differ contrarilywise are the more truly contrary species. And the other species, i.e., the intermediate, must be composed of their genus and their differentiae. (E.g. all colours which are between white and black must be said to be composed of the genus, i.e. colour, and certain differentiae. But these differentiae will not be the contraries that are primary; otherwise every colour would be either white or black. They are different, then, from the primary contraries; and therefore they will be between the primary contraries...

All the other intermediates also, therefore, are composite; for that which has more of a quality than one thing and less that another is compounded somehow out of the things than which it is said to have more and less respectively of the quality. And since there are no other things prior to the contraries and homogeneous with the intermediates, all intermediates must be compounded out of the contraries. Therefore also all the inferior classes, both the contraries and their intermediates, will be compounded out of the primary contraries. Clearly then, intermediates are 1) all in the same genus, and 2) intermediate between contraries, and 3) all compounded out of the contraries".

(159) Aristotle, Categories, c. 8, 10 b 12-25.

(160) Ibid., c. 9, 11 b 1.

(161) John of St. Thomas, Cur. Phil., Vol. II, p. 810 a 35:
"Ut autem ex his constare possit, quomodo in formis substantialibus non inveniatur contrarietas proprie dicta, est no-
tandum, quod ista transmutatio est duplex: alia sine motu, sicut quae fit in materia prima, ut est pura potentia ad formas substantiales; alia cum proprio motu, quando scilicet potest inveniri inter formam et formam aliqua continuatio, vel secundum magis et minus vel secundum additionem aut minorationem formae, quae illam variare facit. In formis enim substantialibus fit variatio sicut in numeris, in quibus quaelibet additio variat speciem, in qualitatibus autem contrariis et physicis fit variatio ad modum continuitatis. Ex eo enim una forma transmutatur in aliam, quia aliqua additione vel diminutione fit alia, sicut album degenerando in pallidum et in viride fit nigrum et calidum diminuendo gradus caloris fit tepidum et transit in frigidum.

Prima ergo transmutatio non pervenit ad contrarietatem propriam, sed est principium contrarietatis, quia quaelibet forma substantialis habet adiunctam privationem alterius, privatio autem est principium contrarietatis, et sic principia naturalia dicuntur esse contraria contrarietate inchoata, quae est privatio et forma, ut diximus I Phy. q. 2, art. 2, 44 ad 1. Secunda vero contrarietas est formalis et propria. Ratio est, quia prima transmutatio non fit secundum distantiam determinatam vicendam per motum et per modum cuiusdam continuitatis, sed per modum mutationis. Et hoc ideo est, quia quaelibet forma substantialis hoc ipso, quod substantialis est, dat primum esse, quod est esse simpliciter, et sic excludit aliam per incompassibilitatem, quia repugnat in eodem subiecto duas formas esse aequas primas et dare primum esse, quod est esse simpliciter. Et sic non opponuntur penes aliquam distantiam maximam et positivam sub eodem genere, sed penes primum et totale esse, et non primum seu non totale, inter quae non est latitudo nec distantia divisibilis, sed indivisibilis oppositio".

Cf. also : Aristotle Metaphysics, XI, c. 11-12, 1068 a 1.

(162) Aristotle, Categories, c. 6, 5 b 30.

(163) John of St. Thomas, Curs. Phil., Vol. II, p. 812: "Quando ergo primo modo se habet contrarietas in formas cum privatio seu exclusio alterius sit effectus secundarius post informationem formae, non repugnat de potentia absoluta impediri, quia est privatio secundario consecuta, non pertinens ad essentialem informationem formae, sicut etiam stat bene duas quantitates penetrari et non se expellere a loco, quia expulsio illa est effectus secundarius quantitatis. Deinde, nisi aliud obstet, bene poterit talis effectus impediri in formis contrariis, etiam si sit privativus et expulsivus alterius formae, quia videlicet ipsa privatio formae non est requisita antecedenter et ex parte subjecti ad hoc, ut aliud contrarium recipiat. Ratio huius est,
quia omnis expulsio aliquorum a subiecto nascitur ex aliquo, quod per se est expulsio. Per se autem primo expulsio est inter esse et non esse, quae est priam ratio omnium oppositionum, non ex aliquo praesignito consecuta, et ideo contradictoria oppositione est radix et principium ceterarum oppositionum. Ergo in his, in quibus per se primo et essentialiter inventur ipsa ratio exclusionis, nullo modo potest etiam de potentia absoluta esse coniunctio, eo quod essentia unius in ipsa exclusione consistit. Ubi autem unum essentialiter non est exclusio alterius, poterit unum esse cum alio etiam si naturaliter sequatur ad alterum ad modum propriae passionis, quia potest impediri ista resultantia. Si autem antecedenter praerequiratur ex parte subiecti negatio aliquiius, ut recipiatur forma opposita, non poterit tunc comungi in tali subiecto, quia ipsa negatio, quae praesignitur, essentialiter est exclusio.

(164) John of St. Thomas, Curs. Phil., Vol. II, p. 815 a 44 : "In gradibus remissis naturaliter possunt esse qualitates contrariae si alias inter illas non sit essentialis oppositio et praerequisita ex parte subiecti ut recipiatum quaelibet illarum formarum. Sumitur haec conclusio ex Diva Thoma, q. 8 de Veritate, art. 14 ubi inquit, quod quando sint formae in fieri, possunt esse simul, ut dum aliiac delabatur, adhuc est in nigradine. Dum autem est in gradibus remissis, adhuc est in fieri. quia adhuc deest aliquid acquirendum. E I pars, q. 76, art. 4, inquit, quod in mixto sunt qualitates contrarias; constat autem illas esse temperatas et remissas. Ratio autem sumitur a priori et a posteriori; a priori quia istae formae habent latitudinem in crescendo, ergo etiam in expelliendo. Ergo aliquid contrariae formae potest esse, antequam alia opposita sit totaliter expulsae, et sic nisi aliquid obstet ex parte subiecti per modum incapacity et repugnantiae, ut diximus, quantum est ex vi formae habentis latitudinem, non repugnat, quod contraria forma paulatim et cum aliqua latitudine entret, et sic non totaliter excludat aliam, sed in alio gradu cum illa comatiatur".

(165) John of Saint Thomas, Curs. Phil., Vol. II, p. 816 a 37 : "Respondetur, quod contraria includunt oppositionem contradictoriam aut privativam non primo et per se, sed consecutivam et secundariam, quia sequitur ex informatione unius exclusio alterius. Et ad probationem ex Aristotele (Meta. IV textu 27 : quod cum fieri non possit, quod contradicitoria de eodem simul sint vera, perspicuum est neque contraria simul in eodem esse posse). Respondetur, quod intelligitur de contrariis secundum effectum secundarium, qui est expulsio secundum quem bene sequitur, quod non possunt contraria simul inesse, quia includunt in se contradictoria, mediate scilicet et secundario, non primario, ut dictum est. Unde subdit ibi Aristoteles, "quod impossibile"
est contraria simul eidem inesse, sed aut ambo secundum aliquid, aut alterum secundum aliquid, alterum simpliciter". Fatetur ergo, quod secundum aliquid, id est secundum gradus remissos, possunt simul inesse, licet non perfecte et secundum gradus intensos".

(166) The example preferred by the Marxists as testimony of the identification of contraries in nature is movement. But even Aristotelians admit the union of contraries in the same subject when it is question of movement: in fact, that is a descriptive definition of movement. But this is not an identification of the contraries themselves. It is impossible to classify motion, because it is an imperfect state of actuality; and only what is in act purely and simply can be accurately classified, or what is simple potency to act---in which case the potency is classified by reference to the act.

Aristotle, Physics III, c. 2, 201 b 25:

"The reason why they put motion into these genera is that it is thought to be something indefinite, and the principles in the second column are indefinite because they are privative: none of them is either 'this' or 'such' or comes under any of the other modes of predication. The reason in turn why motion is thought to be indefinite is that it cannot be classed simply as a potentiality or as an actuality---a thing that is merely capable of having a certain size is not undergoing change, nor yet a thing that is actually of a certain size, and motion is thought to be a sort of actuality, but incomplete, the reason for this view being that the potential whose actuality it is, is incomplete. That is why it is hard to grasp what motion is. It is necessary to class it with privation or with potentiality or with sheer actuality, yet none of these seems possible. There remains then the suggested mode of definition, namely that it is a sort of actuality, or actuality of the kind described, hard to grasp, but not incapable of existing".

In a later book of the Physics Aristotle says that motion does not destroy the principle of contradiction---this may be quoted directly against the Marxists:

Physics VI, c. 9, 240 a 20:

"Nor in reference to contradictory change shall we find anything unanswerable in the argument that if a thing is changing from not-white say to white, and is in neither condition, then it will be neither white nor not-white: for the fact that it is not wholly in either condition will not preclude us from calling it white or not-white. We call a thing white or not-white not
necessarily because it is wholly either one or the other, but because most of its parts or the most essential parts of it are so: not being in a certain condition is different from not being wholly in that condition. So, too, in the case for being and not-being and all other conditions which stand in a contradictory relation; while the changing thing must of necessity be in one of the two opposites, it is never wholly in either”.

This passage is the basis of the refutation of the Marxist dialectics of nature. It indicates the logical confusion upon which the dialectics is constructed. This will be seen more fully in the last part of the thesis where the Aristotelian doctrine of becoming is treated.

Cf. The following quotation from St. Thomas on the nature of motion.

(166) Continued: St. Thomas in III Physics, lect. 2, no. 3:
On the Definition of motion:
"Considerandum est igitur quod aliquid est in actu tantum, aliquid vero in potentia tantum, aliquid vero medio modo se habent inter potentiam et actum. Quod igitur est in potentia tantum, nondum movetur, sed iam motum est: illud igitur moventur, quod medio modo se habet inter puram potentiam et actum, quod quidem partim est in potentia et partim in actu; ut patet in alteratione. Cum enim aqua est solum in potentia calida, nondum movetur, cum vero est iam calefacta, terminatus est motus calefactionis; cum vero iam participat aliquid de calore sed imperfecto tum movetur ad calorem; nam quod calefit, paulatim participat calorem magis ac magis. Ipse igitur actus imperfectus coloris in calefactibili existens, est motus; non quidem secundum id quod actu tantum est, sed secundum quod iam in actu existens habet ordinem in ulteriorem actum; quia si tolleretur ordo ad ulteriorem actum, ipse actus quantumcumque imperfectus esset terminus motus et non motus, sicut accidit cum aliquid semiplene calefit. Ordo autem ad ulteriorem actum competit existentis in potentia ad ipsum. Et similiter, si actus imperfectus consideretur tantum ut in ordine ad ulteriorem actum, secundum quod habet rationem potentiae, non habet rationem motus, sed principii motus; potest enim incipere calefactio sicut a frigido, ita et a tepido. Sic igitur actus imperfectus habet rationem motus, et secundum quod comparatur ad ulteriorem actum ut potentia, et secus dum quod comparatur ad aliquid imperfectius ut actus. Unde neque est potentia existentis in potentia, neque est actus existentis in actu, sed est actus existentis in potentia; ut per id quod dicitur actus, designetur ordo eius ad ulteriorem actum. Unde convenientissime Philosophus definit motum, dicens quod motus est entelechia, idest actus, existentis in potentia secundum quod huiusmodi".


(168) Aristotle, *Categories*, c. 10, 12 a 27.

(169) St. Thomas, in *Metaphysics* X, c. 5, nos. 2052, 2053.


(171) Ibid., c. 10 12 b 25.


(173) St. Thomas, *Comm. in meta. X*, nos 2045-2048 :

2045 : "Sed quod non sit contradictio absoluta, sed contradic- 
tio quaedam patet ex hoc quod contradictio de sui ratio- 
ne non requirit neque aptitudinem, neque etiam existen-
tiam alicuius subjecti. Verificatur enim de ente et de non ente 
quocumque. Dicimus quod animal non videt, et lignum non videt, 
et quod non ens non videt. Sed privatio de necessitate requirit 
aliquod subjectu, et quandoque etiam requirit aptitudinem in 
subjecto : quod enim est ommino non ens non dicitur privatum.

2046 : "Et ideo dicit quod privatio aut est in determinata poten-
tia, scilicet cum aptitudine ad habitum, aut saltem "con-
cepta cum suspективo", idest cum subjecto, licet non 
habet aptitudinem ad habitum. Sicut si dicas vocem indivisibi-
lem, aut lapidem rem mortuam.

2047 : "Et ideo contradictio non potest habere medium : sed 
privatio aliquo modo medium. Necesse est enim omne aut 
aequare aut non aequale esse, sive sit ens sive non ens. 
Sed non necesse est dici de omni, quod sit aequale aut inaequale; 
sed solum hoc necesse est in susceptivo æqualitatis.

2048 : "Sic igitur oppositio contradictioeis ommino est immediata; 
oppositio vero privationis est immediata in determinato 
susceptivo; non autem est immediata simpliciter. Ex quo 
patet quod contrarietas quae nata est habere medium, propinquior 
est privationi quam contradicitioni, Nondum tamen habetur, quod 
privatio sit contrarietas".


(175) Ibid., c. 10, 13 b 5.

(176) Ibid., c. 10, 13 b 12.

(177) Ibid., c. 10, 13 b 26.
(178) Ibid., c. 10, 12 b 5; cf. also: Aristotle, Meta. IV, c. Topics, II, 2, 189 b 118.

(179) S. Thomas, Comm. in Physics I, lect. 14, no 2:
"Dubitatio autem et error antiquorum philosophorum hic fuit. Primi qui secundum philosophiam inquisierunt veritatem et naturam rerum, diverterunt in quandam aliam viam a via veritatis, et a via naturali: quod accidit eis propter infirmitatem intellectur eorum. Dixerunt enim quod nihil neque generatur neque corrupitur: quod est et contra veritatem et contra naturam... Et ad hoc ponendum eos infirmitas intellectus coegit; quia nescierunt hanc rationem solvere, per quam videbatur probari quod ens non generatur. Quia si ens fit, aut fit ex ente: et utrumque horum videtur esse impossibile, scilicet quod ens fiat ex ente et quod fiat ex non ente. Quod enim ex ente ali­quid fieri sit impossibile, et hoc manifestum est, quia id quod est non fit; nihil enim est antequam fiat; et ens eam est eam est; ergo non fit. Quod etiam ex non ente aliquid fieri sit impossibile, ex hoc manifestum est, quia semper oportet aliquid subjici ei quod fit, ut supra ostensum est, eet ex nihiloe nihil fit. Et ex hoc concludebatur quod entis non erat generatio ne­que corruptio."

No. 4: "Et hanc distinctionem antiqui non percipientes, in tan­tum peccaverunt, quod nihil opinati sunt fieri; nec opinati sunt quod aliquod aliorum praeter id quod ponebant primum principium materiale, haberet esse substantiale. Puta, dicentes aerem esse primum accidentale; et sic excludebant omnem generationem subs­tantialem, soleam alterationem relinquentes: ex eo scilicet quod, quia non fit aliquid per se vel ex non ente vel ex ente, opina­bantur quod nihil possit fieri ex ente vel non ente".

(180) S. Thomas, Comm. in Physics I, lect. 7, no. 3:
"Platonici vero utrique rationi acquiruerunt, concedendo im­possibilita ad quae deducunt. Acquiererunt ergo primar rationi, quae ducebat ad hoc quod non-ens esset ens, si aliquis diceret quod ens significet unum, vel substantiam tantum vel acciens, tan­tum, et per hoc vellet dicere quod omnia sunt unum: - huic rationi dico, acquiererunt quod non ens esset ens. Dicebat enim Plato, quod accidens est non ens: et propter hoc dicitur in VI Meta. Quod Plato posuit Sophistismam circa non ens, quia versatur maxime circa ea quae per accidens dicuntur. Si ergo Plato, intelligens per ens substantiam, concedebat primum propositionem Parmenidis, dicentis quod quidquid est praeter ens est non ens; quia ponebat accidens, quod est praeter substantiam, esse non ens. Non tamen concedebat secundum propositionem, hanc scilicet: quidquid est
non est nihil, licet enim diceret accidens esse non ens, non
tamen dicebat accidens esse nihil, sed aliquid. Et propter
hoc secundum ipsum non sequebatur quod sit unum tantum...Sed
alteri rationi, quae ducebat ad hoc quod magnitudo esse indivi-
sibilis, assentiebat faciendo magnitudines esse indivisibles
ex decisione, ideo dicendo quod magnitudinem divisio ad indi-
visibilitatem terminatur. Ponebat enim corpora resolvi in supe-
rficies, et superficies in lineas, et lineas in indivisibilis,
Ut patet in III de Caelo et Mundo".

(181) Aristotle, Physics I, c. 5, 188 b 22.

(182) John of S. T. Curs. Phil., Vol. II, p. 46 a 30 to 46 b 24:
"Secundo speciali modo dicitur prima contrarietas illa,
quae invenitur in genere substantiae qualiscumque illa sit, eo quod
sustantia est primum genus inter omnia praedicamenta,
ideoque oppositio, quae in illa invenitur, dicitur prima con-
trarietas. Et hoc ratione dixit Aristoteles in hoc libro tex-
tu 56 principia esse prima contraria, quia est in eis contra-
rietas primi generis, id est substantiae.

Tertio modo adhuc specialius dicuntur prima contraria,
quae privative opponuntur, eo quod privativum est principium con-
tra rietatis, ut probatur in lo Meta., textu 16 et sq. et a D.
Thoma ibi lect. 6. Omnis enim contrarietas includit privatio-
nem, non tamen omnis privativum contrarietas est. Unde dicit S.
Thomas opus. 37 cap. 2, quod "privativum et habitus faciunt con-
trarietatem, et dicitur I phy. Et ideo contrarietas reducunt-
ur in habitum et privationem tamquam in primam oppositionem,
quae est in genere". Cum ergo in substantia non detur proprie
contrarietas, sed privativa oppositio, quatenus una forma im-
portat privationem, alterius, manifestum est deri primam con-
trarietatem, id est principium contrarietatis, quae est priva-
tiva oppositio".

(183) John of S. T. Cur. Phil., Vol. II, p. 44 a:
"Respondetur in principiis rei naturalis non posse dari
contrarietatam proprie et stricte dictam situm in accidentibus,
sed largo modo pro privativa oppositio, vel si inter ipsas for-
mas substantiales attendatur oppositio, potius est incompossi-
bilitas quaedam contrarietas. Imo in hoc deficiat antici
philosophi, quia ponebant principia esse contraria more acciden-
tium, quia ipsi formas substantiales non agnoscebant, sed pro
principiis contrariis assignabant calidum et frigidum, vacuum
et plenum, item et amicitiam et aliqua similia, ut notavit phi-
losophus in hoc I libro cap. 5, textu 49. Ipse autem in textu
52 docet substantiam nullius rei esse contrarium. Quare non
potest poni in principiis rerum naturalium contrarietas proprie
dicta, nisi cum antiquis ponamus non dari formas substantiales,
sed solum accidentales, secundum quas fit generatio.

(184) Aristotle, Physics I, c. 7, 190 a 32.

(185) Ibid., c. 7, 190 b 27.

"Ex his ergo manifeste deducitur verissimam esse sententiam Aristotelis, quod dantur duo principia naturalia quoad compositionem et in facto esse, et tria quoad mutationem et in fieri.

Primum patet quia ea sunt principia compositionis, in quae resolvitur quidditas et ratio rei naturalis; unumquodque enim resolvitur in sua componentia. Quiditas autem rei naturalis composita est, non entitas simplex sicut angelus; homo enim ex corpore et anima constat et in illa resolvitur, et sic reliqua entia naturalia resolvuntur in materiam et formam. Ergo partes seu principia compositionis sunt materia et forma, et sunt partes per se, quia quidditas ipsa rei naturalis in illa resolvitur tamquam in partes componentes quidditatem, nec alia partes assignabiles sunt, ex quibus quidditative res naturalis componatur. Quod vero distinguantur forma et materia inter se, quod aliquid voluerunt negate, q. 3 et 4, se. ostendetur. Quod vero dentur tria principia pro generatione seu fieri rei naturalis, scilicet materia, forma et privatio, probetur ex ipsa natura mutationis. Et quidem supponimus non dici est tria principia intrinsea generationis, quia generationem intrinsecum componant, sed quia generatio ab illis essentialiter dependet. Etenim omnis mutatio positiva essentialiter est transitus de aliquo non esse ad aliquod esse; facit enim aliquid de novo, aliquin non mutarret, si nihil novi faceret, sed id, quod antea erat, permaneret. Si autem aliquid de novo ponitur, opporet, quod antea non fuerit et nunc sit. Ergo necessario debet fieri ex privacione seu ex non esse, et sic privatio principium mutatio est. Quod vero requiratur materia, constat manifeste, quia mutatio non fit, nisi transmutetur aliquid de uno ad aliud,
ita quod ipsi termini mutationis accedant in aliquo subjecto. Successio enim unius ad aliud extra omne subjectum nihil transmutat de uno ad aliud. Subjectum autem mutationis materiali dicitur. Denique quod requiratur forma manifestum est, cum sit terminus intentus, ad quem tendit mutatio. Et sic dicitur principium mutationis, quia est primo et per se intentum, et sic est primum in intentione, licet in executione sit ultimum, ubi consummatur totus motus".

(188) Ibid., c. 9, 192 a 2-25.
(189) This identification of matter and privation is the fundamental error of the marxists dialectic.
(190) S. Thomas, De Potentia, q. 3, art. I. ad 16 :
"Dicendum quod si ly ex nominet causan, non fit aliquid ex opposito nisi per accidens, ratione scilicet subjecti. Se vero nominet ordinem, tune fit aliquid ex opposito etiam per se; unde et privato dicitur principium esse fiendi, sed non essendi".

Cf. John of Saint Thomas, Cur. Phil. II, p. 41 a 35-42 a 8 :
"Respondetur quod illa particula "ex aliis", solum importat ea, a quibus res essentialiter pendet, sive in facto esse sive in fieri, ut a componentibus vel inchoantibus, eo quod principium et principiatum ita se habent, quod principiatum resolvitur in principium. Principium autem in quantum tale non resolvitur in aliud, nisi etiam sit principiatum; et ita in quantum principium, non est ex aliio. Causa autem efficiens et quaecumque alia extrinsecas non incuudit in definitione ista principiorum naturalium, ut dicemus art. 3,. Nec enim causae extrinsecae sunt principia, ex quibus natura ipsa rerum constat sive in fieri sive in facto esse, sed efficiens dicitur "id, quo incepit motus"; finis, "propter quem incipit"; exemplar, "id cuiussimulationem fit"; nulla vero causa extrinsecas dicitur, ex quo aliquid fit.

Ad id vero, quod opponitur contra privationem. Ad primam replicam dicitur, quod sola privatio sumitur ex parte termini a quo formaliter loquendo et communiter ad omnem mutationem, formaliter quidem, quia ex aliis entibus non potest dici, quod aliquid fiat per se et formaliter, sed solum materialiter et per accidens, ut D. Thomas dicit in hoc libro lect. 10, sicut ignis, b. g. potest generari materialiter ex pluribus rebus, ut ex ligno, ex papyro, ex aqua, etc. Formaliter autem fit ex illis omnibus quatenus conveniunt in privazione ignis. Quod vero aliqua non possunt fieri ex quolibet, non ideo est, quia formaliter non fiat ex
privatione, sed quia non semper materia est proxime disposita, ut ex illa forma educatur vel uniatur, sicut ex lapide non potest immediate fieri equus. Communiter autem se habet privatio adomnem mutationem, quia in omni mutatione et motu, etiam quando fit ex contrario in contrarium, inventur ex parte termini a quo privatio; non contrarietas non exercetur sine privatione".

(191) Aristotle, Physics I, c. 8, 1911, b 10.


(193) Physics I St. Thomas comm. lect. 15, no. 10:

The natural appetite of matter; does not have to possess intellection in itself. This in against philosophers like Avicenna who says that matter does not have a natural appetite for form:

"Sciendum est enim quod omne quod appetit aliquid, vel cognoscit ipsum et se ordinat in illud; vel tendit in ipsum ex ordinatione et directione alicuius cognoscentis, sicut sagitta tendit in determinatum signum ex directione et ordinatione secati- tantis. Nihil est igitur aliud appetitus naturalis quam ordinatio alicuius secundum propriam naturam in suum finem. Non solum autem aliquid ens in actu per virtutem activam ordinatur in suum finem, sed etiam materia secundum quem est in potentia; nam forma est finis materiae. Nihil igitur est aliud materiam appetere formam, quam eam ordinari ad formam ut potentia ad actum. Et quia, sub quaecumque forma sit, adhuc remanet in potentia ad aliam formam, inest ei semper appetitus formas; non propter fastidium formae quam habet, nec propter hoc quod quaerat contrariam esse simul; sed quia est in potentia ad aliam formas, dum unam habet in actu..."

(194) The appetite of matter for forms: compare this with the evolution theory of the Marxists.

John of S. Th. Curs. Phil. Vol. II, p. 78 a 5:

"Duo possimus considerare in appetitu materiae; primum, quid sit; secundum, ad quid sit et ad quae se extendat. Quantum ad primum supponenda est illa vulgaris distinctio appetitus innati et eliciti. Primum est appetitus ab ipsa natura ortus sine media cognitione, ut in lapide pondus ad centurum. Elicitus est, qui procedit ab aliquo mediante cognitione, sicut cum animal appetit cibum vel potum. Quod si appetitus iste oriatur ex cognitione intellectiva, sidetur appetitus rationalis seu voluntas et si ulterior sequatur ad cognitionem opponentem objectum cum indifferentia non adstringente neque coarctante tantum ad unum, erit appetitus li er. Unde aliud est appetitus innatur, qui est sine cognitione et opponitur elicito, aliud naturalis seu necessarius, qui opponitur libero et potest esse elicitus. Pertinet autem ad
appetitum tendere ad rem, quando caret illa, et quiescere in rem, quando habet illam, ut S. Thomas dicit I p. q. 19, art. 1. Sed tamen propriè dicitur et denominatur appetitus ab illo primo actu, quando tenditur in rem non habitam; rem enim quam habemus, non dicimus tantum appetere, sed frui, quod est ali­quid plus quam mere appetere.

Dicimus ergo, QUOD APPETITUS MATERIAE EST APPETITUS INNATUS QUI NON DISTINGUITUR AB EJUS ENTITATE.

Non stat hoc ex philosopho I phy. textu 81, quem ibi decla­rat D. Thomas contra Avicennam lect. 15. "Nihil" inquit, "est aliud materiam appetere formam, quam eam ordinari ad formam. Ideo inest ei semper appetitus formae, non propter fastidium formae, quam habet, nec propter hoc, quod puaret contraria esse simul, sed quia est in potentia ad alias formas, dum unam habet actu". Videri etiam potest I. q. 59 art 2, ubi inquit, "quod inclinatio, quae est ad esse rei, non est per aliquid superaddi­tum essentiae, sed per materiam, quae appetit esse, antequam habeat, et per formam, quae tenet rem in esse, postquam fuerit".

Ratio autem est, quia appetitus naturalis non est necesse, quod sit aliquis actus vel impetus activus ad aliquid, sed solum habitudo et ordo ad sibi conveniens. Maxime autem materiae est conveniens forma, per quam perficitur et actuatur. Ergo ordo et habitudo ad formam maxime est inclinatio connaturalis materiae. Quod autem dicit solet, quod inclinatio sequitur formam, ut inquit D. Thomas I p. q. 80 art 1, non tollit, quod materia habeat inclinationem ad formam, quia non dicit, quod ad solam formam sequitur inclinatio, et ita inquit I Phy. lect. 15, quod non solum aliquod ens actu per virtutem activam, sed etiam materia secundum quod in potentia ordinatur in suum finem".

(195) John of S. T. Curs. Phil. Vol II, p. 824 b 11. "Nec tamen nos dicimus semper ita contingere, quod ex quo­libet elemento fiat aliud immediate, sed quod potest ita fieri, neque ex vi suae dispositionis repugnat. Atque ita non se habet sicut animalia, quae naturaliter ad sui transmutationem exigunt transire per diversas formas et generationes, ut advertit S. Thomas q. 3, De Potentia art. 9. Hoc enim elementa non exigunt ex natura, sua, sed potest immediate fieri transitus de uno elemento ad aliud, nisi per accidens ex debilitate agentis aut ex alio impedimento oppositum contingat, sed ex se potest esse tanta activitas elementi supra aliud, quod immediate illud in se con­vertat, sicut si in maximum ignem iniciatur gutta aquae".

Note that in the above they are speaking of elements of the physical world as they understood them.
Dicimus secundo, quod materia appetit omnes formas sub una ratione formalis. Et hasc ratio in materia sublunari est id, in quo convenient omnes formae corruptibiles, scilicet esse substantiale, corruptibile et generabile. Et ita sumitur ex D. Thoma opus. 15, c. 6 in fine et Ip. q. 66, art. 2. Nec est putantum, quod materia versatur circa unam formam, quam primo et per se appetat, et quae in omni materia inventur, v.g. formam corporeitatis; hoc enim improbat S. Thomas Cit. locis, quia materia solum appetit formas propter perfectionem, quam ab illis habet. Et licet a diversis formis diversae perfectiones proveniant, tamen cum materia sit capax omnium illarum, omnes illas dicitur appetere et ab illis perfici, et ita appetit omnes, quatenus convenient in modo perficiendi et actuandi materiam, Sicut visus recipit omnes colores, quatenus convenient in una ratione visibilis et in uno modo immutandi potentiam, sic materia appetit omnes formas, in quantum convenient omnes in tali modo et ratione informandi materiam, scilicet modo corruptibili.

Ex quo colligitur, quod materia quantumcumque informetur ab ali- qua forma perfecta, semper appetit alias, quia hic appetitus non est aliud quam ipse naturalis capacitatem materiae ad formas, quae tali modo. Scilicet corruptibili, informare possunt. Et licet una forma sit perfectior altera, non tamen una informat perfectiori modo quam alia, sed omnes eodem modo, scilicet corruptibili. Et ideo finis et perfectio materiae non sistit in perfectione alicuius determinatae formae sed in adaequatione et collectione omnium. Unde habita forma perfectissima, melius est ipsi materiae ad aliam transire quantumcumque viliorem, ut suam adaequationem imploet, quam sub illa forma perfectissima manere, non implendo talem adaequationem, sicut visus quantumcumque videat perfectissimum, adhuc est in potentia ad videndum alios, quia ab omnibus eodem modo immutatur et perficitur.

Nec tamen ex hoc inferas dari in materia appetitum ad plures formas simul habendas, quia licet ex parte subiecti simul detur in eo appetitus omnium, non tamen ex parte obiecti ad habendas omnes simul in sensu composito, sed diviso, propter incomposibilitatem unius formae cum altera et privatione, quam una habet adiunctam alterius, sicuti in me est simul potentia ad sedendum et sedendum, non tamen ad sedendum et standum simul".

John of St. Thomas, Cur. Phil., II, p. 101 b 23:
"Respondetur omnem materiam esse capax omnium et omnium formarum, mediata vel immediate, totaliter vel partialiter, sicut materia formicae vel lapidis sub illis dispositionibus non est capax formae hominis vel elephantis, sed sub aliis dispositionibus, quarum dispositionum capax est. Quod si tam parva quantitas ut granum non est capax totius formae elephantis, est tamen capax, ut sit pars illius, et sic informari potest ab eius forma".

Pius XI, Encycl. Divini Redemptoris, paragraph 2.
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