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Alvin Goldman Galileo Galilei Friedrich Wilhelm Joseph Schelling
Pierre Naville **Georg Wilhelm Friedrich Hegel** Louis Althusser
Lodovico Geymonat Mario Rossi
Friedrich Engels Aristotle Maurice Godelier
Galvano Della Volpe Herbert Marcuse Francis Bacon
Max Wertheimer György Lukács Immanuel Kant
Leon Trotsky Warren Sturgis McCulloch

Marxist Logic and Modern Sciences

Paul Fraisse Gottfried Wilhelm Leibniz
Jean-Paul Sartre **Karl Marx** Roger Garaudy Bertrand Russell
George Novack François Jacob
Robert Harding Whitaker Friedrich Adolf Trandelenburg Henri Lefebvre
Evert Willem Beth John Dewey
René Descartes Johann Gottlieb Fichte Plato
Ludwig Feuerbach Henri Bergson Claude Lévi Strauss Nicolas Bourbaki
Jean Piaget



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Marxist Logic and Modern Sciences

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Introduction

This book adds, fortunately, to two others published this year in our language, dealing with the same subject: *Dialectical Materialism* by Henri Lefebvre and *Critique of Contemporary Ideology* by Galvano Della Volpe. Of this last author, we already knew *Rousseau and Marx*, and his and his disciples' contribution to the polemics over the concrete—abstract—concrete circle.¹ Unfortunately, two important works of this school have not yet been translated, such as the book by Mario Rossi *Marx e la dialéctica hegeliana* and from Della Volpe, *Logica come scienza positiva*. However, if we consider that in previous years several works have been published of importance directly or indirectly related to the Marxist methodology, mainly by Louis Althusser, a number of books relating to structuralism and historical and dialectical materialism, the true publishing boom that constituted the works of Jean Piaget, together with those of Alvin Goldman, György Lukács, Herbert Marcuse and Jean-Paul Sartre, dealing directly or indirectly with the relationship between Marxism, epistemology, sociology, and Hegel, we cannot complain.

The work by George Novack we present, as the whole of Lefebvre's, is characterised by the vindication of Hegel's influence in Marx and by trying to popularise the broader lessons of the great masters of Marxism. But Novack's has a difference with Lefebvre's: his explanation of logic in general and of Marxist logic in particular starts from and is aimed at the political and revolutionary activity. Novack joins his deep scientific knowledge of the subject — especially of Hegel, Marx, Engels, Lenin and Trotsky — with his status as a revolutionary militant who speaks to teach or improve a method of thinking in other revolutionaries. His examples are taken from the daily activity of militants to be brought to the action itself. His analysis of the different stages of logic has the same goal: to recover or teach methods that are true and also to make them useful for action. Lefebvre attempts to do the same when he writes but in his pages stands out the attempt to be heard mainly by intellectuals and not by militants. Hence, Lefebvre's examples, as his norms are generally of and for scientific research, rather than politics. For a Marxist as Novack, the importance of the latter is not in contradiction with science since Marxism is the first and only political science, which combines a social movement (the working class struggle for socialism) with science, causing politics to cease being an ideology, as it had been until its advent. Instead, Lefebvre's political examples are some among many; they may be these or any other as if they were equally related branches of knowledge. For a consistent Marxist knowledge, in this era, is not a sum of parts, i.e. of different sciences, but a combination in which predominates the militant, political-revolutionary aspect. In this sense, we must consider Novack's work, inspired by the same sources as Lefebvre's and with many points of contact with each other, as superior.

The same circumstances that gave origin to this book explain its character. The conferences were held in 1942, almost 30 years ago, after the split of the Socialist Workers Party of the United States in which the author was an active member.

¹ This is the interpretation of Marx's *Outlines of the Critique of Political Economy*. The polemics to which we refer was carried out in the Italian Communist Party's journal *Rinascita* and was published [in Spanish] in the first issue of the journal *Cuadernos de Pasado y Presente*, in Cordoba.

In the year 1940, the SWP splits between those who are for the defence of the USSR from any attack by an imperialist country and the “anti-defencists”. At that time the USSR had signed a pact with Hitler’s Germany, invaded Poland and divided it with Nazism. This betrayal of internationalism by Stalin and his nauseating policy had provoked the just indignation of American intellectual circles. But outrage led them to an incorrect characterisation of the USSR, which snuck into the party through the anti-defencist faction. The problem — a beautiful example of the petty bourgeois way of reasoning, impressionable, confusing appearance with essence — was: What is the difference between Russia and Germany or any other imperialist country if it has agreed with the Nazis to invade Finland or Poland? “None”, said the anti-defencists. “A total difference”, argued the other faction: “Germany is imperialistic; Russia is a degenerated *workers’ state*”. How to explain then the internal contradiction of the USSR that, being still a workers’ state, agrees with an imperialist nation to invade a small country? And how can the contradiction between the two countries be explained, which subsequently lead them to war? The answer to these questions posed a problem of method, among others. So it was no coincidence that one subject discussed in the SWP’s internal struggle has been that of dialectics, the only method that could explain these contradictions: Russia was a workers’ state but degenerated; just as the union was of the workers but its leadership was bureaucratic, which explained its foreign and domestic policy. And so the conclusions were diametrically opposed. The fraction defined by Trotsky as a representative of the proletarian party in the process of formation gave this account of the contradictions and claimed the USSR had to be defended from attack by an imperialist country, as a workers’ state although this is combined with the goal of getting rid of the bureaucratic leadership. The anti-defencist faction, petty bourgeois in its social composition, did not see the contradictions, taking just one fact — the foreign policy of the USSR at the time — to conclude “it is imperialist” and therefore does not have to be defended.

The last lesson of Trotsky to his American disciples was precisely this internal polemic of defence of the USSR and of dialectics. Novack in his lectures gathered in this book, popularises the teachings of the great masters of socialism, mainly Trotsky, about dialectics, as a way to resist pressure from the American intelligentsia that was still clinging to the traditional way of thinking of that country, Anglo-Saxon empiricism and pragmatism.

CHAPTER I

Piaget's epistemology

What is surprising in Della Volpe and all Marxists mentioned, except for Goldman, is that they do not take any account of modern epistemology and psychology of knowledge, the scientific research on knowledge and its ties with formal logic and dialectics. Pierre Naville, little known in Spanish, is another exception to the rule since he combines his Marxism of good stock with a thorough understanding of new scientific discoveries. Unfortunately, his specialty is neither logic nor epistemology but society in industrialised countries.

This disregard of the scientific development or studying it but not giving it any importance is a serious mistake since solidarity Marxism is inextricably linked to it. Just as Marx cannot be explained without his connection with Hegel, with utopian socialism, the British economy, the German democratic movement, the European labour movement, and later Darwin's theory of evolution, today there can be no Marxism without considering modern psychology and epistemology.

Within these sciences, there is a current, Piaget's psychology and genetic epistemology, which has revolutionised them. This scientific genius, who has nothing to do intentionally with politics, has come to agree with Marxism and dialectics because his methodological basis is, unwittingly, Marxist. His investigations are based on the following premises: 1) the explanation of all phenomena, including knowledge, is to be found essentially in the praxis, or activity genetically or historically considered as a relationship between a whole organised, social and individual, man, with the environment; 2) man is a continuation then, in a new plane and in a certain sense, of biological life; therefore he has many elements, categories and laws in common with this, albeit much more developed and modified in form, as in their results.

Human activity, for Piaget, is the more or less sophisticated way how the species meets the biological law of accommodation to the environment and the assimilation of objects from this. This law is fulfilled through structured behaviours, "rhythms, regulations and groupings"¹ of operations which tend to strike a balance between the external world and the internal organisation of the subject. Man carries this out with plasticity, richness, and a multitude of means not known by his brothers (the other biological species), such as work, technology, language, thought, scientific knowledge, art, morals. In man, the structuring is more pronounced than in animals and tends to a more stable equilibrium. Scientific knowledge is the highest expression, in human behaviour, of this biological tendency to balance between accommodation and assimilation through structures since in the formal knowledge reversible structures are achieved.

1. The subject and the object in human knowledge

Piaget argues that scientific, objective knowledge is a special type of activity. Said in other words, of the relationship between object and subject.

1 Piaget, Jean, *Psychology of intelligence*, Littlefields, Adams & Co., Paterson, New Jersey, 1960, p. 167 and following.

If knowledge is an activity, rather a construction, as such, even the most empirical fact has to pass through the filter of a coordination of actions, i.e. through structures made by the subject.

For a better explanation, we will use two terms Piaget uses, although in another context: discovery and invention.² We can chronicle the discovery of the moon. This history will also be the history of the inventions that are allowing us to increasingly know it. Discovering is to assimilate something existing. Inventing is to make, to build the non-existent, although with existing materials. Between invention and discovery, there is a close, intimate relationship, although they are the opposite: one leads us to grasp what exists; the other, to create what is possible, therefore new, what is not there. But man cannot discover anything new without previous invention and he cannot invent if he has not discovered. Without the telescope first and rockets later we would never come to know and discover the real moon. This approach — considering scientific knowledge as a construction, as a dialectical interface between subject and object — goes against the conception of knowledge as a copied reflection of reality. Put another way, the subject cannot establish a direct relationship with the object of knowledge, since between them mediates thought, which is a structure that the subject constructs to achieve that accommodation and assimilation of the object. “But when we turn to physical experiment at however primitive a level, the necessity for such framework is extremely significant, since it demonstrates the impossibility of a ‘pure’ experiment in the sense of a direct and immediate contact between subject and objects. To put it another way: any kind of knowledge about an object is always assimilation into schemata, and these schemata contain an organisation, however elementary, which may be logical or mathematical”.³

Apparently, there is nothing more obvious, of more direct and immediate grasp, than the objects that exist in the outer world. It seems that just by looking at it we have imprinted forever “that factory is that factory” or “that truck is that truck”. Piaget argues this evidence is absolutely false because it is not immediate but constructed, a product largely developed. Only the coordination of multiple different actions on real objects leads us to that objective truth — that they exist. Without moving ourselves and manipulating the objects at the same time we look at them, we would not have come to build in our thinking the permanence of these objects, i.e., to be aware that the objects remain even if we do not see them. Hence, for Piaget, the Aristotelian principle of identity is the product of a formalisation of these coordinations of internalised actions or propositions and not simply evidence or immediate beginning of a coherent argument against what the discoverer itself believed. That is to say, this principle is part, result, or product of a formal structure and cannot be taken in isolation; just as in natural thought the evidence of the object is also the product of a structure or scheme of real action.

2. The definition of thought and knowledge

Against the very nineteenth-century conception— Marx included —⁴ that thought is a consequence of language, of the senses, or of society, Piaget says: “intelligence was born of action, and even, if you like, of the polarised action in organised solids”.⁵

Language, representations, and society extend in time and space the possibilities of thought, that is, of internalised actions, but nothing else. For Piaget the child’s objective actions are

2 In *Mathematical Epistemology and Psychology. Essay on the Relationships between Formal Logic and Real Thought*, Dordrecht, Holland, D. Reidel Pub. Co.; New York, 1966. Piaget devotes a subchapter (p. 198), to show that all progress in the science of mathematics is both an invention and a discovery, as opposed to real life, where invention and discovery are independent.

3 Piaget, Jean, *Biology and Knowledge. An Essay on the Relations between Organic Regulations and Cognitive Processes*. University of Chicago Press, 1974, p. 335.

4 “Language is the immediate actuality of thought. Just as philosophers have given thought an independent existence, so they were bound to make language into an independent realm.” (Marx, Karl, “The German Ideology”, *Marx & Engels Collected Works*, Vol 5, Lawrence & Wishart, London, p. 446.) Although also in the same work other relationships of the language with consciousness and consciousness with life and society are insinuated.

5 Piaget, Jean, *Lógica y conocimiento científico, (Tomo I: Naturaleza y métodos de la epistemología)* [Logic and scientific knowledge, (Volume I: Nature and methods of epistemology)], Proteo, Buenos Aires, p. 38.

internalised with his development; these internalised actions become thought. Without language and society, that child could not advance a step beyond the level of the chimpanzee, because language and society are indispensable supports for internalising behaviours or activities, although they are not thought. Society is explained by activity, as society multiplies it by transforming it into an externally coordinated activity. This external coordination, when internalised, will allow the objectivity of knowledge, product of social control, i.e., of the different points of view.

The definition of thinking leads us by the hand to the definition of knowledge, including scientific knowledge, where “from the point of view of the biological problems that they raise, we can distinguish three forms of knowledge that result from the exercise of the cognitive functions in man — at least when he reaches a certain level of civilization. In the first place, there is the vast category of knowledge acquired by means of the physical experience of every type, that is, the experience of external objects or of whatever appertains to them, abstractions being made of objects as such. At once it will be seen that this means an extension of learning behaviour or practical intelligence, but there are all sorts of aspects to it which need explanation.” “In the second place, there is the remarkably narrow category — and also very debatable as far as its actual extension— of knowledge structured a hereditary programming, such as it may be the case with some perceptual structures (seeing colour and two or three dimensions in space). The limited nature of this second category at once raises a great biological problem, just because of the contrast between it and the great variety of instincts in animals. In third place, there is the category of logico-mathematical knowledge, and this at least as extensive as the first. Such knowledge achieves independence of experience, and, even at the stage where it is still bound up with experience, it seems to spring not from objects as such, but from the general coordinations of the actions performed by the subject on the objects around it.”⁶

3. The classification of sciences

Based on this analysis, Piaget divides the sciences into two major groups: formal and objective sciences. Formal logic and mathematics are in the first group because they are derived from the subject’s actions. Physics, biology, sociology and psychology are in the second group because they capture the object or the subject, man, but as an object of knowledge.

Among the sciences there is no linear relationship but circular and in a spiral, a consequence of scientific knowledge being nothing more than an expression of man’s relationship with the environment through his praxis or activity. The first sciences are mathematics and formal logic because they are the closest and easiest to abstract by man since they come from his own activities. Physics, biology, sociology, and psychology will emerge later on because they are more distant from man as a scientific object. But psychology explains logic and mathematics, just as sociology and biology provide insights into psychology, biology into chemistry and physics to the latter, while mathematics serve to explain physics as demonstrated by mathematical physics. So we close the circle, going from subject to object. According to Piaget, the larger or smaller the object is, i.e., the more it leaves the observation frames, the greater the involvement of the internalised structures of man, in this case, mathematics, to understand it. In other words, the more formal knowledge is. When the object is observable or can be manipulated, the greater is the role of experience in its knowledge. We are not trying to summarise 60 years of research by Piaget, in addition to the research of his collaborators, but rather we take him into account when considering the different critical interpretations of Marxist logic.

⁶ Piaget, Jean, *Biology and Knowledge*, op. cit., p. 266.

CHAPTER II

The Della Volpe school

Galvano Della Volpe, in one of his courses, by insisting that there is one and only one logic —the experimental logic discovered by Galileo— he is synthesising his position and that of his school: “...it means that there is not, finally, more than *one* science because there is only one method, that is *one* logic: the *materialist* logic of the modern Galilean experimental *science*, stripped, it is understood, of the more or less mathematising Platonism which is the philosophical background of the science of every bourgeois scientist, from Galileo to Einstein”.¹

What is, then, the peculiarity of Marxism if in logic everything has already been said since Galileo? “A deontology”, says Mario Rossi, the most lucid of Della Volpe’s disciples. That is, the struggle for socialism or, put another way, transforming a must be in part of the method. Alas, we now have the name and surname of Marx’s true method: moral Galileism. “Where, we repeat, research techniques vary, but there is only one logic — the materialistic logic of modern science. And this can also be said to be the moral Galileism peculiar to Marxism (i.e., that the ‘moral sciences’ are without exception ‘science’ in the strictest sense): and we say Galileism to mark the distinction of Marxism as a method not only from idealism and its hypostasis but also from positivism with its idolatry of ‘facts’ and relative, Baconian, repugnance to the ‘hypothesis’.”²

If we want a greater abundance of data on this “moral Galileism” characteristic of Marxism, they will send us to the concrete-abstract-concrete circle that, according to them, is the method that Marx precise as his own in Method of Political Economy.

1. Confusion of Marxism with experimental empiricism

With Marxist garb and a mass of quotes, this school wants to reduce Marxism, we hasten to say, to one of its moments — experimental empiricism.

Knowledge of reality had a colossal progress since the invention of the experimental method discovered by Galileo Galilei. This method is based, like those of Aristotle or Bacon, in observation, in the senses, although controlled by measurements, hypothesis, and precise laboratory observations, determined, as opposed to the passivity or lack of these controls by the other mentioned methods based on observation. But there are methods of knowledge superior to direct observation, to the senses, such as theories or causal explanations. By simple observation, we would have never arrived at the theory of relativity or any of the other great theories of modern knowledge.

Della Volpe never tires of insisting that the base of all knowledge is the sensations, perceptions, of solids or the unity. “As for Aristotle, we have established above all that: 1) *The prime root of the non-contradictory character of truth lies in the act of perception*, i.e., in *actualized sensation* which

1 Della Volpe, Galvano, “La struttura logica della legge economica nel marxismo — IV Lezione”, [“The logical structure of economic law in Marxism - Lesson IV] in *Metodologia Scientifica* [Scientific Methodology], Riuniti, Roma 1955 (Publication of Instituto Gramsci), p. 28.

2 Ibid, p. 28.

is itself knowledge, since its actuality expresses the disjunctive nature of every actuality through the immutability of the *sensed quality* which [...]. 2) The axiom *nihil in intellectu quod non prius fuerit in sensu* [there is nothing in the intellect which is not first in the senses] assumes a quite radical significance in this respect if it is enmeshed in the genesis of the logical principle itself. This is shown by the *recognised 'infallibility' of sense-perception* due to numerical unity or oneness or uniqueness or singularity or punctuality of the felt material quality: with regard to which is to be assumed as derivative that 'determination' that makes thought current, effective; hence it has been said that 'every word means something, and something unique' (highlights ours).³

"That anti-Eleatic part of the theory already seen and quoted, which concludes by making non-contradiction an indubitable principle, inasmuch as it concerns to the senses and the discursive or intellectual knowledge, is based on knowledge already given by it (under the form, we can say, of a positively 'intuitive' act)".⁴

This worship of the senses is typical of empiricism and of experimentalists who are empiricists, as Della Volpe, who ignore, as Piaget says, "The essential fact from which it is appropriate to begin [which is ...] that no knowledge, not even perceptual, is a simple copy of reality since it is always a process of assimilation to previous structures", and "On the contrary, an experimental science is a science for which experimentation is a necessary condition of knowledge. But this does not mean that the condition is sufficient as it can be combined with other cognitive processes such as mathematical deduction. Nor does it mean that experimentation based on the empirical model of the experience which is interpreted because experimentation is never reduced to a simple reading but contains a part of structuring involved in the activities of the experimenter and the interpretations of the apparently immediate data."⁵

Already Darwin warned: "... all observation must be for or against some view if it is to be of any service!"⁶

Fearful of mathematical structures, which experimentalists incorporate into observation to better interpret the phenomenon, Della Volpe is frightened by the mathematising tendency of scientists, as a Platonising tendency, although he considers mathematics to be an "essential constitutive element in formal elaboration of the laws physics in general".⁷

Della Volpe's mistake is to believe that knowledge comes from the senses and not from the actions of men. He does not notice that the primary logics, based on the observation-construction of knowledge, have been followed by the elaboration of a new construction logic based on abstractions and not observations, that is, a much richer logic. The founders of this new logic which puts the stress on construction, being much freer to become largely independent of observation, are Hegel and Marx, although it is the implicit logic of all modern sciences already placed at their feet.

This is why Della Volpe and his disciples ignore the contribution of Hegel and Marx to modern logic and science — that the first thing in knowledge, its basis, are not the senses but the praxis, the activity of thought, the structures that thought gives itself. For Marxism, praxis is not only a criterion of truth — as indicated by the famous thesis II on Feuerbach, and the *raison d'être* of a duty ("to transform the world"), as pointed out by the equally famous thesis XI of the same work, that Dellavolpianians like to quote — but also a support base of knowledge. For Marxism, activity, praxis, is the first source of knowledge, the criterion of truth, and the great transformer of the world. It is all this and not just, as the Dellavolpianians want, a reason to be of a moral obligation or, as Hegel wants, just a builder of knowledge and by that way of reality itself.

This neglect of activity makes them define and state poorly their fundamental category of knowledge — the determinate abstraction.

3 Della Volpe, Galvano, *Logic as a Positive Science*, Verso, 1980, p. 141.

4 *Ibíd.*, p. 142.

5 Piaget, Jean, *Lógica y Conocimiento Científico* [Logic and scientific knowledge], op. cit., p. 44.

6 Darwin, Charles, *Letter to Henry Fawcett*, 18 September 1861.

7 Della Volpe, Galvano, *Rousseau and Marx*, Lawrence and Wishart, 1978, p. 200.

2. The determinate abstraction according to Della Volpe and according to modern epistemology

“That the methodical circle, a corollary of the critical postulate of matter, reveals itself as a dialectic of determinate or historical abstractions and, as a matter of fact, as an analytical or scientific dialectic.”⁸ “And, finally, our own dialectical method as far as — we will see — it is the logical-historical method of certain abstractions.”⁹ Thus Della Volpe summarises the essence of his method, which is the determinate abstraction. This abstraction starts from the “concrete”, from what is observable in the sciences of nature or from a precise historical moment in the human sciences.

Della Volpe is right when he thinks the determinate abstraction, based on observation and the senses, as historically in a given time, serves knowledge. But he makes two mistakes; he does not realise this abstraction is a product of the activity, of the structuring of the subject, combined with the observation or consideration of a historical moment; he completely ignores other types of abstractions that enrich knowledge even more. He defines the determinate abstraction poorly and ignores abstractions of greater importance.

It is Piaget who has better defined the true character of the determinate abstraction by stating: “Certainly, the qualities thus abstracted [...] correspond to perceptual relations and it could be argued they also give rise to an abstraction from perception and from the object itself. But, both in this case and in others, there is more in the (abstract) notion than in the perception, that is, the abstraction consists of adding relationships to the perceptual data and not only in extracting them. To recognise the existence of common qualities, such as square or round, large or small, ‘flat’ or three-dimensional, etc., is equivalent to constructing schemata relating to the actions of the subject as well as the properties of the object: a square (material) is a figure whose four sides or angles can be equal in the object, but which only become equal once equalled (in actions of measuring or mentally) by the activity of the subject. In a much more general way, the common qualities on which a classification is based are ‘common’ insofar as the objects lend themselves to this sharing. Abstraction is thus the function of an activity [...]”¹⁰

“Abstraction from perceived objects, which we shall call empirical abstraction (in the hypothesis that non-perceptible objects are the product of operations) that consists simply of extracting from a class of objects their common characters (by a combination of abstraction and of generalisation only) [...]”¹¹

But Piaget himself points out that there is another type of abstraction, the constructive abstraction: “[...] it is one thing to take the perceived objects as having the x character to gather them without further formalities in a class that only possesses that x character, which then constitutes a process that we shall call ‘simple’ abstraction and generalisation (the one that classical empiricism invokes) and another thing is to recognise in an object an x character to use it as an element of a structure different from that of the perceptions considered, which we will then designate with the name of ‘constructive’ abstractions and generalisations.”¹²

But there is not only simple abstraction and constructive abstraction but a third abstraction, the reflexive one, which is also constructive, which is the one that has never relied on perception and relies only on the actions of the subject for its constructions: “[...] it consists of extracting

8 Ibid, p. 217.

9 Della Volpe, Galvano, *Crítica de la Ideología Contemporánea* [Critique of Contemporary Ideology], Alberto Corazón, Madrid, p. 38.

10 Piaget, Jean and Inhelder, Bärbel, *Génesis de las estructuras lógicas elementales* [The genesis of the elementary logical structures], Guadalupe, Buenos Aires, 1967, pg. 265.

11 From “Epistemología Genética” [“Genetic Epistemology”], p. 203, quoted by Antonio M. Battro in *Diccionario of Epistemología Genética*, Proteo, Buenos Aires, 1971, p. 17. [English version: Piaget: Dictionary of Terms, Battro, Antonio M. (Ed.), Pergamon Press, New York, 1973.]

12 Battro, Antonio M., *Diccionario of Epistemología Genética* [Piaget: Dictionary of Terms], op. cit., p. 17.

from a system of actions or operations of a lower level certain characters whose reflection (in the physical sense of the term)) ensures on top-level actions or operations because it is only possible to acquire consciousness of the processes of a previous construction by means of a reconstruction in a new plane.”¹³

As we see, when considering knowledge as a construction, different types or stages of that construction appear with their corresponding abstractions, of a first and second degree in relation to the object and the reflective abstractions, parallel to the other two, related to the actions of the subject. The construction based on observation originates the empirical, simple, or Dellavolpian abstraction — the one based on abstractions of any degree but taken directly or indirectly from the objects gives rise to the directly constructive one; those that rely on the actions of the subject are reflexive, they take their elements from their own constructions and not from the object. The combination of all these abstractions and mainly of the last two gives us much more useful logical tools than the poorest of them: the determinate or empirical abstraction.

3. The concrete-abstract-concrete circle

The lack of understanding of the different types of abstractions achieved by the construction of knowledge prevents Della Volpe from understanding Marx in *Outlines of the Critique of Political Economy*.

Della Volpe speaks of a single concrete-abstract-concrete method when Marx describes two, which are precisely the same two abstractions that Piaget points out, although without the precision of the latter. Marx says that:

“When considering a given country from the standpoint of political economy, we begin with its population [...].

“It would seem right [*Es scheint das Richtige*] to start with the real and concrete, with the actual presupposition, e.g. in political economy to start with the population [...] however, that this is wrong. Population is an abstraction if, for instance, one disregards the classes of which it is composed. These classes in turn remain an empty phrase if one does not know the elements on which they are based, e.g. wage labour, capital, etc. These presuppose exchange, division of labour, prices, etc. For example, capital is nothing without wage labour, without value, money, price, etc. If one were to start with population, it would be a chaotic conception of the whole, and through closer definition one would arrive analytically at increasingly simple concepts; from the imagined concrete, one would move to more and more tenuous abstractions until one arrived at the simplest determinations. From there it would be necessary to make a return journey until one finally arrived once more at population, which this time would be not a chaotic conception of a whole, but a rich totality of many determinations and relations. The first course [*Der erste Weg ist*] is the one taken by political economy historically at its inception. As soon as these individual moments were more or less clearly deduced and abstracted, economic systems were evolved which from the simple [concepts], such as labour, division of labour, need, exchange value, advanced to the State, international exchange and world market.

“The latter is obviously the correct scientific method. [*Das letztreißt offenbar die wissenschaftlich richtige Methode*] The concrete is concrete because it is a synthesis of many determinations, thus a unity of the diverse. In thinking, it, therefore, appears as a process of summing-up, as a result, not as the starting point, although it is the real starting point, and thus also the starting point [*nicht als auffassung*] of perception and conception.”¹⁴

Let’s repeat, for Marx, there are two methods, not one, “the first course” and the “latter” which is “obviously the correct scientific method”. On the other hand, for scientific thought, which

¹³ Ibid, p. 18.

¹⁴ Marx, Karl, “Outlines of the Critique of Political Economy (Rough draft of 1857-58)”, *Marx & Engels Collected Works*, Vol 28, Lawrence & Wishart, London, p. 37-38.

makes systems, the concrete, the real, is not “the starting point” although it is so in reality and in sensible intuition.

These two working ways of thought, these two levels of abstraction, one prior to modern science and the other that founds it, escape the analysis of Della Volpe, who ignores Piaget and misinterprets Marx. We leave for another part of this work the analysis of the most substantial of this work by Marx, which Della Volpe does not even acknowledge: the Piagetian concept of construction and production of knowledge.

Hence, neither Della Volpe nor his antagonists in the well-known polemic have been able to respond correctly to the problem posed by the march of knowledge. This consists, simply, in going from one construction to another, from a simpler structure of thought to a more complex one. This is why Della Volpe will never be able to understand why Marx says, on the one hand, that the population is the “real and concrete” and, at the same time, that, as a starting point of knowledge, it is “an abstraction”. Because if the concrete is the final product of a reasoning, its starting point is the abstract, although both are products, since the starting point, in turn, has been a previously elaborated product, as the concrete achieved will be in turn an abstraction for future reasonings or constructions. Put another way: abstract and concrete are relative and not absolute terms. Every beginning is abstract in relation to the result, which is the concrete. But since that concrete will be a new beginning, it will be abstract in relation to the new result.

4.-The new hypothetical-deductive logic

The author we are criticising not only ignores that for Marx there are two methods of knowledge of the object (and not just one, the concrete-abstract-concrete) but also that epistemology along with modern psychology have discovered a new one: the hypothetical- deductive method, which no longer works building on abstractions drawn from reality or from activity, but on possibilities, on hypotheses. The psychology of knowledge noticed that adolescents between 12 and 15 years of age begin to use a new way of thinking, deductive-hypothetical.¹⁵ Studying the development of the sciences, the psychology of knowledge discovered a close, though not total, parallel between the natural development of intelligence and the development of the sciences. This logic is the logic of the great theories of modern science. If Della Volpe ignores the genetic psychology of intelligence, the latter would not ignore him. We believe it would classify his method of determinate abstraction as a good example of the thinking of a child between 8 and 10 years old. He would not be in bad company, since Henri Bergson and other illustrious philosophers are even further behind, between 4 and 6 years of mental age.

This new method is not characterised by the mere use of the possibles. These arise in every internalised action, as a forecast of the result. Thinking, before an action takes place, in its possible outcome creates a new category within thought — the possible or hypothesis. This possible is at first intimately linked to an observation, an action, or a thought (which is the same, since they are actions, internalised or not). They are hypotheses linked to the here and now, dominated by and subject to action. That is why in daily life, those who have not arrived at the hypothetical-deductive thought limit themselves to formulating one or two hypotheses (“it is possible that on Sunday Carlos comes to visit me”). The new method is characterised precisely by independent hypotheses of observation or more or less immediate action, to elevate them to a structure or system as a whole, of connection among many possible with abstractions drawn from observation or of construction with those abstractions.

An example will make this leap in the type of thought more understandable. Some people, as we have already said, only consider it is possible “Carlos will come to visit me on Sunday” but others, who reason much more, make possible structures, such as “if on Sunday there is no football because it rains or the game played by Carlos’s favourite team plays outside of Buenos Aires, or if

¹⁵ Inhelder, Bärbel and Piaget, Jean, *The Growth of Logical Thinking from Childhood to Adolescence*, Basic Books, New York, 1958.

his wife wants to come to visit my wife, it is possible that Carlos will come to visit me”. “If he does not come to visit me, he sure goes to the football.”

Maybe Carlos comes to visit me for one of the possibles or for a combination of them, as it is also probable that Carlos neither goes to the football nor comes to visit me. If so, it would be because I have not taken other possibles or abstractions from Carlos’s actual behaviour, such as “when he’s doing very well with his wife he does what she wants and she loves going to the movies or staying at home watching television”. The latter is what he just did. This error will be a product of my system of possibles not being enough since I should have added that “it is possible that his wife would not like to come to visit me and instead she would go to the movies or stay to watch television”.

As this example demonstrates, taken from natural thought and not from the logic of the propositions studied by Piaget with its four transformations, with this new logic the relations between the actual and the possible are reversed. With the empirical-experimental logic, the possible was a moment of the actual, with the new logic the actual is a moment of the possible. The reality (that Carlos will stay at home to watch television) is just one of the possibles we have worked on.

The important thing is that, at a certain level of the development of thought and science, the logic of the possibles or hypothetical-deductive appears, as we had previously the logic of the observables and then the construction of the concrete with abstractions, which is none other than the construction of hypothetical systems, combining abstractions with hypotheses.

The field of science opens up to the possibles articulated in systems-structures that make it immensely rich, full of possibilities. It is no longer a matter of whether “tomorrow I will see my friend”, but of many possibilities combined with each other that will give me the explanation of my friend’s action.

Who surmised this new logic — who else! — was Hegel, who dedicates a special subchapter to him in his *Greater Logic*, although he also misused it: instead of scientific he made it speculative. Because, freed and limited to their own borders, without combining with other methods and with practice, with reality, it originates speculation. Combined with practice and the other methods, it becomes the most formidable tool of knowledge. For this, the possibles that enter their structures have to be taken out of the development of the sciences, that is, of the abstractions of the observation, of the constructions with abstractions, and of previous possible or hypothetical-deductive systems taken for their corroboration to the practice and reality.

This method has allowed physics to progress from that of Galileo Galilei to quantum mechanics and Einstein’s relativity. It is the method we believe the Dellavolpiani must learn to leap from their current 8 mental years to the 15 required by the normal scientific level, i.e., hypothetical-deductive.

5. The contradiction in Della Volpe and in Hegel-Marx

The school of Della Volpe leads a ruthless attack against Hegel and his dialectic for several reasons: it does not consider transforming the world and has nothing to do with the Marxist dialectic, with the contradictions as, according to them, Marx takes them.

For this school, there are two contradictions in reality. One, present, “the problematic contradiction” and another “resolutive”, to be achieved. We will give an example to be understood. In the present there is a certain problematic and negative contradiction, for example, the following: “the true limit of capitalist production is this: that (‘social’) production is only production for the (‘private’, ‘bourgeois’) capital.”¹⁶ This real contradiction originates a solution that is a “contradictory opposite”, that is, the opposite of the negative side of the contradiction (private, bourgeois capital) that is socialism. In the present, there is a contradiction which is solved by maintaining the positive

¹⁶ *Capital*, Vol. III, quoted by Della Volpe in *Crítica de la Ideología Contemporánea* [Critique of Contemporary Ideology], op. cit., p. 55.

side of it (social production) and opposing the production for society (socialism) to production for the bourgeois.

This conception of contradictories as separate entities, as determinate abstractions that repel each other, is linked to a denunciation of Hegelian contradictions as aprioristic and, what is more important, for being part of a unit or a whole. “[...] the non-contradiction or determination of thought and knowledge, which Hegel, let us say intoxicated with the absolute divine unity of the idea, has dogmatically but coherently denied, as the principle of the multiple and of the analysis, and has ‘totalled’, i.e., ‘overcome’, in the abstract synthetic principle of the divine and unitary self-contradiction of the idea (= Hegelian contradiction proper).”¹⁷

But that is precisely the merit of Hegel and Marx: having put the multiple and the analysis into the whole, in the synthesis, having shown that contradictions occur within a system, of a balanced whole that necessarily goes to a crisis, to an imbalance. In the Dellavolpian contradiction, there is no unity, relationship, they are not poles of a whole, because they are contradictions between objects or entities. The secret of the Hegelian-Marxist dialectic is the organic relationship. The contradictions are in a determinate relationship, unity, or totality. To discover that relationship and its determinate dynamics is the task of Marxist dialectic and where it differs not only from the determinate abstraction of Della Volpe but from the abstract relations and totalities of Hegel.

It is curious but Della Volpe and his disciples never mention the fundamental contradiction of capitalist society (bourgeoisie-proletariat) or the current moment (revolution-counterrevolution), to hide in other more abstract contradictions such as the aforementioned social production-capitalist property. The capitalist regime is one regime, not two regimes, which has within it several contradictions that fed it, developed it, and are taking it to its grave: capitalist production relations—colossal development of the productive forces; private ownership of the means of production—social production; bourgeoisie—proletariat; imperialist countries—colonial countries. The capitalist regime is inconceivable without these contradictions. Who discovered that in every unity there is a whole of contradictory relationships was Hegel. And something else: that the movement, the history of everything, is explained precisely by being a contradictory unity.

Della Volpe has reason to criticise Hegel because he does not see the contradictions are acute, tragic. But this is due to Hegel’s specific discovery: the contradictions of knowledge, of thought, and when they are those of the real world only as concepts. Truly, in the world of concepts, of the elaboration of thought, contradictions are less acute than in reality. But the merit of Hegel, which Della Volpe has not even glimpsed, is that he was the first to unify the contradiction in an identity as a totality and thanks to this he motorized the identical-totality, set it in motion towards its destruction and overcoming in other totalities, although he limited it to those of knowledge.¹⁸

6. Tell me who you are with and it will tell you who you are

It is not uncommon for Della Volpe to consider Aristotle, Galileo Galilei, and Kant’s attempt to take the principle of non-contradiction as the “principle of experience”, and, finally, “the analyses, for example, of Dewey and his philosophical school of partly Galilean inspiration”, together with the Marx Dellavolpianically interpreted, as the masters or best exponents of the true scientific method. He extends this pondering to the modern logical positivists, although without full solidarity with them, as it does with John Dewey.

In contrast to these considerations or affiliation, he denies any methodological importance to rationalism and idealism (Descartes, Leibniz, Kant, and Hegel). The only exception is made with the Kant vindicator of the principle of experience.

We must recognise the result of this school since it eliminates from its history of logic everything that is not empiricism, knowledge based on the senses. Both Dewey and the logical positivists are

¹⁷ Della Volpe, Galvano, *Crítica de la Ideología Contemporánea* [Critique of Contemporary Ideology], op. cit., p. 54.

¹⁸ Della Volpe, Galvano, *Logic as a Positive Science*, op. cit., p. 143.

precisely the great contemporary worshipers of empiricism. Della Volpe may well have learned something from his admired Soviet philosophers, who assert of the positivists, something we can extend to the empiricist-experimentalists: “There is no doubt that there is a certain relationship between positivism and the natural sciences, but this relationship is very peculiar. We could say that positivism uses at the same time the progress and difficulties of science [...]. Internally there is no genetic link between positivism and the natural sciences [...]. In general, all positivists are shown denying the possibility of knowledge of the essence of the thing and the relativism of the absolute, from the angle of idealistic subjective propaganda, concealed under the chatter of the overcoming of idealism and unilateral materialism.”¹⁹

But, precisely, the merit of Descartes, Leibniz, Kant, and Hegel is that they were the discoverers of the role of thought as a knowledge builder, against the static theories of the ancients (Plato and Aristotle) or of the senses of Aristotle, Francis Bacon and Galileo (although the latter is between the two epochs). In what follows, we will have the opportunity to dwell on the history of the different theories of knowledge and the logics they originated. What is important, for now, is to emphasise that the Dellavolpiani not only categorically deny Hegel but all the philosophers who discovered the active, constructive role of thought, including Marx, who categorically says: “Hence, in contradistinction to materialism, the active side was set forth abstractly by idealism — which, of course, does not know real, sensuous activity as such.”²⁰

The same happens to Della Volpe with Hegel and the Marxist dialectic (heir to Hegel) as with Piaget: he does not understand it — enraptured with empiricism or positivism — but this does understand his relative contribution. As we have already shown, the thought that rests on the senses or in a specific historical situation is a source of valid knowledge, it is an important moment, but it is not the only method, nor does it exhaust the Marxist logic. Also correct is the criticism by Della Volpe when he says the mere combination of abstractions proves nothing by itself, as Hegel believed, but this does not negate the capital discovery of this genius.

19 Guliga, A.V., *Vozniknovenie Pozitivizma* [The Emergence of the Positivists], *Voprosi Filosofii*, 1965, No. 6, p. 57.

20 The translation of this part of Thesis I (on Feuerbach) is the one appearing in “The German Ideology”, *Marx & Engels Collected Works*, Vol 5, Lawrence & Wishart, London, p. 3.

CHAPTER III

Sartre and Della Volpe against Engels

All modern revisionist currents attack Engels in the name of Marxism. They accuse him, mainly Sartre and Della Volpe, of having left Marx, for having generalised the laws of dialectics to all nature¹ and, therefore, of “Hegelian”.

The problem of either the coincidence or mismatch between Marx and Engels must be analysed, in our opinion, taking into account the division of tasks between them² and carrying out a careful reading of the texts and correspondence of Marx, which has not been done by the authors we criticise.

This will allow us, in addition to settling the question about Engels, to approach the true thought of Marx himself.

1. A total coincidence

Both Marx and Engels vindicate Hegel as the discoverer of two new logical concepts that encompass all natural and human phenomena: there is no pure unity since it is always a totality of relations and everything is a historical process. Engels says: “Everything consists of cells. The cell is Hegelian ‘being-in-itself’ and its development follows the Hegelian process step by step right up

1 Jean-Paul Sartre in *Marxismo y Existencialismo* [Between existentialism and Marxism] (Sur, Buenos Aires, 1963, p. 35) considers that the laws or dialectical concepts that Engels imposes on nature, like Hegel, are not “in addition”, “but praxis”; besides “the upshot of this is paradoxical: Engels criticises Hegel for imposing the laws of thought on matter, but he does precisely the same himself, in that he expects the sciences to verify a dialectical reason which he discovered in the social world. But, in the historical and social world, as we shall see, there really is a dialectical reason; by transferring it into the ‘natural’ world, and forcibly inscribing it there, Engels stripped it of its rationality: there was no longer a dialectic which man produced by producing himself, and which, in turn, produced man; there was only a contingent law, of which nothing could be said except it is so and not otherwise. In short, Reason once more becomes a bone, since it is merely a fact and has no knowable necessity. It so happens that opposites interpenetrate. Rationality is merely a final and universal law; and therefore it is irrationality pure and simple” (Sartre, Jean-Paul, *Critique of Dialectical Reason*, Vol 1, *Theory of Practical Ensembles*, Verso, London, 1991, p. 32).

For Della Volpe and his disciples, those laws only apply to man or to a specific historical moment. They also insist on the “error” of Engels, of having taken from the Hegelian left the false illusion that Hegel’s method serves and the system does not, i.e., that “[...] what has prevented mainly, from Engels onwards, capturing the true nature of the dialectic [...] is a gross logical simplification [...]” (*Crítica de la Ideología Contemporánea* [Critique of Contemporary Ideology], op. cit., p. 57) and that, therefore, it is necessary to achieve “the elimination also of a (mythical) ‘dialectic of nature’ of Hegelian-Engelsian memory”. “The interpretative tendency of these studies reflects in substance the Engelsian thesis [...] of “the distinction between method and system” which “is decidedly contrary to the letter and spirit of Hegelian philosophy” (page 18). Mario Rossi extensively develops this criticism in *Marx and Hegelian Dialectics*.

2 What is inadmissible in “specialists of Marxism” is not in our possible young readers; hence we clarify: Marx and Engels, who had fundamentally in common the revolutionary activity, imposed themselves from the beginning a division of tasks that, at the time of their maturity, materialised in Marx devoting himself primarily to the economy and Engels to the philosophy and science of nature. The correspondence between them clearly shows that it was only this and not different conceptions. But it would be naive to think that both Sartre and Della Volpe have not noticed this. We explain later the reason for the orientation that these modern “Marxists” give to their reading.

to the final emergence of the ‘idea’ — i.e. each completed organism.”[...]Another result that would have delighted old Hegel is the correlation of forces in physics, or the law whereby mechanical motion, i.e. mechanical force (e.g. through friction), is, in given conditions, converted into heat, heat into light, light into chemical affinity, chemical affinity (e.g. in the voltaic pile) into electricity, the latter into magnetism. [...] This much is certain — comparative physiology gives one a healthy contempt for man’s idealistic arrogance in regard to other animals.”³

Concerning man’s agreement with nature, Marx says: “[Man] can work only as Nature does, that is by changing the form of matter.” And in a note, he clarifies his concept by quoting another author who states: “All the phenomena of the universe, whether produced by the hand of man or through the universal laws of physics, are not actual new creations, but merely a modification of matter. Joining together and separating are the only elements which the human mind always finds on analysing the concept of reproduction and it is just the same with the reproduction of value.”⁴

Not only can we see Marx here agreeing with Engels, but also, this is a brilliant anticipation of the discoveries of modern epistemology (the categories of reunion and separation in the construction of thought).

What remains of the Marx of Sartre and Della Volpe, who disagreed with the unification that Engels made of the laws of nature and man?

2. Engels is not the only one ignored by dramatist Sartre

We start from the assumption that ignoring Engels, Marx is the second ignored or not understood. But there is more. With an incomparable literary audacity, Sartre describes the relations of modern science with dialectics: “Until now the dialectical method has not yet really intervened to interpret the material facts of the organism.”⁵ “It may be said that the metaphysical hypothesis of a dialectic of Nature becomes more interesting when it is used to explain the passage from inorganic matter to organic bodies, and the evolution of life on earth. This is true. But it should be noted that this *formal* interpretation of life and evolution will never be more than a pious dream as long as scientists have no way of using the notions of ‘totality’ and ‘totalisation’ as a guiding hypothesis. Nothing is gained by proclaiming that the evolution of the species or the appearance of life are moments of the ‘dialectic of Nature’ as long as we are ignorant of *how* life appeared and *how* species are transformed. For the present, biology, in its actual research, remains positivistic and analytical. It is possible that a deeper knowledge of its object, through its contradictions, will force biology to consider the organism in its totality, that is to say, dialectically, and to consider all biological facts in their relation of interiority. This is *possible*, but it is not *certain*.”⁶

However, even if Sartre ignores it, biologists — from the middle of the last century — have used as “the notions of ‘totality’ and ‘totalisation’ as a guiding hypothesis” and have been able to explain “how species are transformed”. François Jacob says: “For Darwin, a living being becomes from the time of its birth part of the immense organised system formed by the earth and everything on it. Natural selection represents a regulatory factor that maintains the harmony of the system. Today we consider that a system of this kind can survive only if the ‘feedback’ loops automatically adjust its functioning. Evolution thus becomes the result of feedback from environment to reproduction.”⁷ And regarding the organism he also insists on the character of totality discovered by Darwin and Wallace: “What gave living beings their intrinsic properties was the interplay of relationships secretly uniting the parts so that the whole should function. It was the organisation hidden behind the visible structure. Thereby the idea became of a nexus of qualities peculiar to

3 In an Engel’s letter to Marx in which he requested Hegel’s *Philosophy of Nature*. (Letter Engels to Marx, 14 July 1858, *Marx & Engels Collected Works*, Vol 40, Lawrence & Wishart, London, p. 326-327.

4 Marx, Karl, “Capital”, *Marx & Engels Collected Works*, Vol 40, op. cit., p. 53.

5 Sartre, Jean-Paul, *Marxismo y Existencialismo* [Between existentialism and Marxism], op. cit., p. 31

6 Sartre, Jean-Paul, *Critique of Dialectical Reason, Vol 1, Theory of Practical Ensembles*, op. cit., p. 34.

7 Jacob, François, *The Logic of Life: A History of Heredity*, Vintage Books, 1976, pp. 175-176.

living beings; what the nineteenth century was to call 'life'.⁸ “The form, properties and characters of living beings, therefore, were subject to regulation from within the system — that is, to the play of interactions coordinating the activity of its elements.”⁹

That is why Marx's admiration for Darwin is not accidental, in him he saw a scientist who had discovered in biology laws similar to his in economics.

From Darwin onwards, the concepts of totality and evolution are dominant, whether consciously or unconsciously applied. The merit of Engels is that he was the first one who, together with Marx, demanded from the sciences the use of these two concepts, which, by themselves, do not advance research one millimetre, but combined with it, they are the only ones that allow the discoveries to be interpreted coherently.

3. Modern epistemology confirms Engels

Research has shown there are common laws between human praxis, thought as part of it, and organic and inorganic nature and that these common laws are dialectical. Piaget has pointed out that this profound agreement between the creations of thought and the real world (which is not total or copy, but isomorphic) occurs because man is a biological and also a physical being and, therefore, his actions obey the laws of biology and physics. Thought does nothing but perfect and create new combinations of those laws that are implicit. The agreement arises from the common root — nature — and not from confrontation.

Science has thus liquidated one bastion of idealism: the privileged character of pure deductive, logical-mathematical thought, which often, a posteriori, applied or coincided with reality.¹⁰

Piaget gives great importance to the opposing actions of gathering and separating, on which, mainly, thought and knowledge are structured. These actions, unconscious, in a mechanical way, also occur in nature, which separates and unites in its development as Marx had already foreseen. This creates similar forms between the laws of nature, praxis, objective knowledge, and pure deduction. Piaget's research begins to coincide with that of Warren Sturgis McCulloch, who finds in the functioning of neurons a logic similar to that of the propositions in the adolescents discovered by the first.

As Engels wanted, the most general laws of dialectics are the laws common to all the processes and totalities of existing relationships, laws that by their very nature demand to specify the specific forms in which they manifest themselves in each stage and which are to be perfected or exceeded, since they are relative.

4. The reasons for a curious agreement

We already said that Sartre and Della Volpe show a total coincidence when it comes to attacking Engels. Apparently, this should not be so since, besides their philosophical conceptions, their political positions are opposite: Sartre is a typical and honest intellectual, who defends with all intransigence his point of view without fear of colliding with any power or apparatus and Della Volpe is a Western intellectual faithful to Stalinism. The secret of their coincidence is the common class root, and their differences stem from their different locations.

Sartre has reflected the French and, to a certain extent, European intelligentsia, desperate and hopeless, which had no independence for its creation since it was sandwiched between the post-war disaster and a workers' movement controlled by an apparatus, the French Communist Party that depended on the USSR.

8 Ibid, p. 44.

9 Ibid, p. 173.

10 The fact that some non-Euclidean geometries have had application in reality long after they have been discovered is, for the metaphysical currents, a proof of the existence of God or the idea before the emergence of the world.

This situation explains his existentialist philosophy, which aims to make the individual with his options the fundamental category of the interpretation of the world. Upon discovering that this individual is not free but is subject to the laws of necessity, he converted to Marxism. From that moment, in his attempt at synthesis, he tried to make the individual praxis, within his new neo-Marxist conception, a privileged sector. This conception led him to raise a Chinese wall between the human and organic and inorganic nature. Any attempt to build bridges or find common laws between both natures is for Sartre, “metaphysical”, “Hegelian”.

Della Volpe represents the sector that joined to the Communist Party in the postwar period, confusing integration to the working class with compliance, idealisation of their apparatuses even if they were counterrevolutionary.¹¹ He had before him the communist parties and the government of the USSR, which followed an unprincipled policy, day by day, similar to that of Bernstein and the German revisionists of the beginning of the century who proclaimed movement is everything, the aims and principles are nothing. The school of Della Volpe has tried to give a theoretical foundation to that opportunistic and without principles practice. No “hypothetical-deductive” or “aprioristic” schemata like that of the most intransigent class struggle; long live the “well-determined abstraction” that starts from the “historical moment” with no baggage or previous principle. For Della Volpe, the most intransigent class struggle is a “Hegelian-Engelsian” “a priori”. Just as for him knowledge does not start from any previous schema and starts directly with perception, so, the correct policy will not arise from combining the fair schema of the most intransigent class struggle with the given situation, but only from the latter. Thus, we would say with Della Volpe: Poland needs at this “determinate moment” as a consequence of a “contradiction” and “determinate abstraction” to sell its coal and, taking advantage of the Asturian miners’ strike against Franco, it sells it to Spain (“determinate solution” of a “determinate contradiction”, typical of moral Galileism, which does not take into account the “a priori” of “Hegelian-Engelsian memory” as the international class struggle and proletarian solidarity).

These “Marxists” are the intellectual justifiers, in a very educated country, of a well-determined practice, that of the Italian Communist Party and mainly of the USSR. In Russia, for Zdanov and Stalin it was enough an order to liquidate a controversy; in Italy, you cannot act like that. That is the reason for the Dellavolpian erudition; and of the agreement with Sartre, in his ill-founded attack on Engels.

¹¹ Within these, there is the Hegelian current with exponents such as Henri Lefebvre and Roger Garaudy. Hegel served to explain and justify the “negative” side, Stalinism.

CHAPTER IV

Structuralism

This new method of interpretation emerged at the beginning of the century from psychology and linguistics. Lately, popularised by Claude Lévi Strauss, it is in fashion.

The experimental psychology of the last century, called associationist, considered that “perception” was “[...] a compound of elementary sensations”.¹ The experience that gave rise to gestaltism is famous: “Let there be two luminous stimuli A and B. If they appear successively in the ABABAB order and if the time interval between A and B and B and A is long, two stimuli are seen. If the interval is shortened, at a given time an alternative movement is perceived between A and B. If the interval is shortened further, two simultaneous stimuli are seen. This movement that he [researcher Max Wertheimer] calls the phi phenomenon depends on the situation as a whole, but not on the elements in particular. This experience will be exemplary for him and the gestaltists. The whole is no longer the sum of the parts. It is something more that cannot be deduced from the parts. Observation is essential.”²

Something similar happened with linguistics. During the 19th century, schools were historicists. No one better reflects this tendency than Wilhelm von Humboldt in his definition “language is not a substance or a finished work, but action (*Sie selbst ist kein werk, ergon, sondern eine tätigkeit, energie*).” “Language, therefore, cannot be defined except genetically”, says the author, quoting Humboldt.³ These speculative and genetic theories that aspired to define the origin and classification of language are followed by comparative research between languages, mainly the Indo-Europeans, with no interest in generalisations. “The determinism of nature found an equivalent in the domain of language that was considered more or less as a living organism, necessarily modified by laws that admit no exception.”⁴ These mechanical laws refer to sounds and not to the written word as in the studies of linguists of the early nineteenth century. Linguistics of the end of last century and the beginning of this one starts from the criticism of this conception of mechanical and fixed laws in the changes of the spoken word. This criticism crystallises in a new conception: the structuralism of Ferdinand de Saussure. In his book published in 1915, he states that “We should also add the associative and co-ordinating faculty that we find as soon as we leave isolated signs; this faculty plays the dominant role in the organisation of language as a system.”⁵

“Language is a system of signs that express ideas and is therefore comparable to a system of writing, the alphabet of deaf-mutes, symbolic rites, polite formulas, military signals, etc. But it is the most important of all these systems.”⁶ “My definition of language presupposes the exclusion of

1 Fraise, Paul and Piaget, Jean, *Traité de Psychologie expérimentale* [Treaty of Experimental Psychology], P.U.F., Paris, 1963, Vol I, p. 21.

2 Ibid.

3 Jespersen, Otto, *Language, Its Nature, Development and Origin*, Allen and Unwin, Great Britain, 1950, p. 56.

4 Malmberg, Bertil, *Les nouvelles tendances de la linguistique*, P.U.F., Paris, 1968, p. 19.

5 Saussure, Ferdinand de, *Course in General Linguistic*, McGraw-Hill Book Company, New York, 1959, p. 13.

6 Ibid, p. 16.

everything that is outside its organism or system [...]”⁷ And so that there is no doubt that for him the story of one word is secondary, as opposed to the role it plays within the system, referring to the words borrowed from one language by another, he says the following: “More important still, a loan-word no longer counts as such whenever it is studied within a system; it exists only through its relation with, and opposition to, words associated with it, just like any other genuine sign.”⁸

As Malmberg says: “it is enough to say that according to Saussure it is the language (the system) what constitutes in the first place the object of linguistics and not the concrete manifestation of the language in the individual word. For Saussure, language is not in principle the word uttered by the individual, but the system superior to the individual. Every linguistic element must be determined from the point of view of its relations with the other elements and their function, not by their extra-linguistic characteristics (physical, psychological, or other).”⁹

Saussure did not limit himself to the systematic aspect, but he continued giving importance to the historical one. After him, the two levels of research in the language, the diachronic, historical, and the synchronic or systematic (structural, as it is said today) became famous.

1. The static structuralism of Lévi-Straus

This author, “guilty” of the current “prestige” of structuralism, has strived to combine it with a mathematisation: “A renovated associationism would have to be based on a system of operations which would not be without similarity to Boolean algebra.”¹⁰

His merit is trying to specify the laws of the whole, as a structure of contradictory relationships. Unfortunately, He stays there, in a dialectic of the formal and static totality, committing the same error of the Gestaltists with their conception of a field that is always the same, without genesis, without overcoming. It does not deny, apparently, history (“*De facto* and *de jure*, there are diachronic structures as well as synchronic structures...”),¹¹ although, in reality, this only serves as a means to prove the structures discovered by an always ahistorical intellect: “history leads to everything but on condition that it be left behind.”¹² That is why he says that “If, as we believe to be the case, the unconscious activity of the mind consists in imposing forms upon content, and if those formal are fundamentally the same for all minds —ancient or modern, primitive or civilized (as the study of the symbolic function, as expressed in language, so strikingly indicates)— it is necessary and sufficient to reach the unconscious structure, underlying each institution and each custom in order to obtain a principle of interpretation valid for other institutions and other customs, provided, of course, that the analysis is carried far enough.”¹³ It is unnecessary to continue much more. It suffices to point out that in *Totemism*, the quote from Comte that follows, appears on the front page as a summary of his conception: “... the laws of logic which ultimately govern the world of the mind are, by their nature, essentially invariable; they are common not only to all periods and places but also to all subjects of whatever kind, without any distinction even between those that we call the real and the chimerical; they are to be seen even in dreams...”¹⁴

7 Ibid, p. 20

8 Ibid, p. 22.

9 Malmberg, Bertil, op. cit., p. 60.

10 Lévi-Strauss, Claude, *Totemism*, Merlin Press, London, 1964, p. 90.

11 Piaget, Jean, *Structuralism*, Harper & Row, New York, 1971, p 108.

12 Ibid, p. 108.

13 Ibid, p. 110.

14 Lévi-Strauss, Claude, *Totemism*, op. cit., front matter.

2. Marx, discoverer of the relationship between the diachronic and synchronic laws

Just as Della Volpe ignores that Marx had already discovered the two types of abstractions with which the mind works in relation to the object, he does not acknowledge, either, that Marx is the first to separate and make independent the two categories which in Hegel were confused, genesis and totality or structure.

In the *Outlines of the Critique of Political Economy*, Marx insists on the structural character of the study of the capitalist economy. For example: “It would, therefore, be inexpedient and wrong to present the economic categories successively in the order in which they played the determining role in history. Their order of succession is determined rather by their mutual relation in modern bourgeois society, and this is quite the reverse of what appears to be their natural relation or corresponds to the sequence of historical development. The point at issue is not the place the economic relations took relative to each other in the succession of various forms of society in the course of history; even less is it their sequence ‘in the Idea’ (*Proudhon*) (a nebulous notion of the historical process), but their position within modern bourgeois society.”¹⁵

And proving ours is not a capricious interpretation, Marx shows it exhaustively when he affirms. “In the money market, capital is posited in its totality; there it *determines price, provides work, regulates production*, in a word, *source of production*; but capital, not only as something producing itself (materially by means of industry, etc., positing price, developing the productive forces), but at the same time as creator of values, must posit a value or form of wealth specifically distinct from capital. This is *rent*. It is the only value created by capital as value distinct from itself, and from its own production. Both by its nature and historically, capital is the *creator* of modern landed property, of rent; just as its action, therefore, appears also as the dissolution of the old form of landed property. The new form arises from the action of capital on the old. Capital is this — in one respect — as creator of modern agriculture. In the economic relationships of modern landed property which appears as a process: rent—capital—wage labour (the form of the series can also be otherwise conceived as: wage labour—capital—rent; but capital must always be the active middle element), the inner structure of modern society, or capital in the totality of its relations, is therefore posited.”¹⁶

Aware that these are two linked but distinct processes (becoming and totality), he insists. “If in the fully developed bourgeois system each economic relationship presupposes the other in a bourgeois-economic form, and everything posited is thus also a premise, that is the case with every [11-24] organic system. This organic system itself has its premises as a totality, and its development into a totality consists precisely in subordinating all elements of society to itself, or in creating out of it the organs it still lacks. This is historically how it becomes a totality. Its becoming this totality constitutes a moment of its process, of its development.”¹⁷

“Let us first analyse the simple determinations contained in the relationship of capital and labour, in order to discover the inner connection, both of these determinations and of their further developments, to what has gone before.”¹⁸

In the second edition of *Capital*, he quotes a Russian critic, who, as a synthesis of his true method, says: “The one thing which is of moment to Marx, is to find the law of the phenomena with whose investigation he is concerned; and not only is that law of moment to him, which governs these phenomena, in so far as they have a definite form and mutual connection within a given historical period. Of still greater moment to him is the law of their variation, of their development,

15 Marx, Karl, “Outlines of the Critique of Political Economy (Rough draft of 1857-58)”, *Marx & Engels Collected Works*, Vol 28, op. cit., p. 44.

16 Ibid, p 153.

17 Ibid, p. 208.

18 Ibid, p. 197.

i. e., of their transition from one form into another, from one series of connections into a different one.”¹⁹ That is, for Marx, there are two laws, one structural and one genetic or historical.

The law of the “definite form”, of the “connection within a given historical period” or of the “internal connection or construction” is none other than the totality, synchronicity or modern structure. The “law of variation”, or of “their development” is the genetic, diachronic or historical. Having discovered these two laws and their necessary unity is one of the most important contributions of Marxist dialectic.

3. The attempt to unify structuralism with modern genetics

Both genetic psychology and some Marxist authors make efforts to incorporate and overcome the postulates of modern structuralism. Piaget has dedicated a book to structuralism and a symposium on the same subject and on the genesis. “As a first approximation, we may say that a structure is a system of transformations. Inasmuch as it is a system and not a mere collection of elements and their properties, these transformations involve laws: the structure conserved or enriched by the interplay of its transformations laws, which never yield results external to the system nor employ elements which are external to it. In short, the notion of structure is comprised of three key ideas: the idea of wholeness, the ideas of transformation, and the idea of self-regulation.”²⁰

These three characteristics of any structure must be combined, says Piaget, with its poles — genesis and function —, denied by the theoreticians of modern structuralism, to achieve a much richer method of the whole. Indeed, the structure becomes formal if we do not show how and why it works, as well as its genesis (including its overcoming or disappearance), which cannot be other than the passage from one structure to another because everything in the universe and in the man is structured, otherwise it could not survive. “In a word, genesis and structure are inseparable. They are temporary, which means that, if we are in the presence of a structure at the starting point and another, more complex, at the arrival point between the two it is necessarily placed a construction process, which is the genesis. There is never one without the other but neither are both reached at the same time because the genesis is the passage from a prior to a later state.”²¹ Which law or scientific theory unites the two aspects? It is the question that Piaget leaves unanswered or, at most tries to answer when he says: “It seems to me that the notion of equilibrium has a particular value to allow the synthesis between genesis and structure and precisely to the extent that it encompasses those of activity.”²² His phrase still leaves without an answer which law or specific laws have that balance between genesis and structure.

4. Matter-movement; structure-genesis

For Engels what existed was matter and motion. Now we know that what exists is structure and genesis. This is how the Engelsian formula is defined and enriched. Of these two categories, the fundamental one is genesis since structure is nothing more than a special type of movement. We can say more: the concept of structure arises as a consequence of the fact that movement penetrates matter, combines with it, and produces a structure. That is, the genesis and the movement are balanced in the structure, they quiet down, they internalise themselves, but they continue to act. What best exemplifies it is that the structure is defined by two equilibria, which are movements of a certain type. One movement is internal (the “transformation system” according to Piaget) and the other, external (a “regulated exchange” between the environment and structure, at least in organisms). This explains why structuralism, even the most static and formal, discovers dialectical,

19 Marx, Karl, “Capital”, *Marx & Engels Collected Works*, Vol 40, op. cit., p. 18.

20 Piaget, Jean, *Structuralism*, op. cit., p. 5.

21 Piaget, Jean; Goldman, Lucien and Gandillac, Maurice de, *Las nociones de estructura y génesis*. Proteo, Buenos Aires, 1969, p. 246.

22 Ibid p. 247.

contradictory relationships, of action and reaction between poles within their structures without history.

This does not mean the synchronic laws are equal to the diachronic ones. The whole is more than the parts and conditions them; the mutual action and reaction between parties, self-regulation, and the tendency to reversibility explain the functioning of every organism; the internal and external balance, as well as the relations between contradictions in the structures and of these among themselves in the systems, these are some of the structural laws. The leap of quantity in quality, the movement through contradictions, the Hegelian resolution (*aufheben*), the crises of structures or systems, as a consequence of the outbreak of contradictions, are laws of genesis in general. If the laws of structure are of the existing, those of genesis or movement are laws of what will disappear or be born. But if these laws are not — as they cannot be so — only of the moment of the end or of birth but of the process that leads to the death of the old and to the new, the laws of the existent are dialectically subordinated. The problem to be solved is the same one that is presented to Piaget: if between both types of laws one can find a theory or a law that unifies them, overcoming the mere affirmation that they are intimately linked.

5. Increased probability and necessity

This close link between genesis and structure originates a new relationship between the category of necessity and probability “In the temporal genesis,” says Piaget referring to the logical-mathematical structures, “the stages only obey increasing probabilities, all determined by an order of temporal succession, but once the structure is balanced and crystallised, it is imposed by necessity on the spirit of the subject.”²³ Necessity was previously considered as a category that began to act from the beginning of a process, causing its results to be imposed. If a process was probable, it was unnecessary. Piaget finds in the formula that we have quoted an answer in a third term that unites those who presented themselves as antagonistic to it. With the “increasing probability”, dynamic synthesis of probability and necessity, this only emerges and imposes itself at the end of the process and not at the beginning.

In another of his books, Piaget draws a parallel conclusion: that the superior structure explains the inferior ones and not vice versa. Marx and Trotsky had seen these same laws in the genesis of one structure to another, both in the biological and in the historical world.

“Bourgeois society is the most developed and many-faceted historical organisation of production. The categories which express its relations, an understanding of its structure, therefore, provide, at the same time, an insight into the structure and the relations of production of all previous forms of society the ruins and components of which were used in the creation of bourgeois society. Some of these remains are still dragged along within bourgeois society unassimilated, while elements which previously were barely indicated have developed and attained their full significance, etc. The anatomy of man is a key to the anatomy of the ape. On the other hand, indications of higher forms in the lower species of animals can only be understood when the higher forms themselves are already known. Bourgeois economy thus provides a key to that of antiquity, etc. But by no means in the manner of those economists who obliterate all historical differences and see in all forms of society the bourgeois forms”, says Marx.²⁴

In his polemic with the anti-defencists, Trotsky masterfully uses, on the one hand, the principles of “increasing probability” and “necessity” and, on the other hand, the future structure (“superior”) as an explanation of the former, the USSR and its historical relationship with the socialist regime.

“Only by taking the necessary historical perspective can one provide himself with a correct judgment upon such a question as the replacement of one social regime by another. The historic

²³ Ibid, p. 251.

²⁴ Marx, Karl, “Outlines of the Critique of Political Economy (Rough draft of 1857-58)”, *Marx & Engels Collected Works*, Vol 28, op. cit., p. 42.

alternative, carried to the end, is as follows: either the Stalin regime is an abhorrent relapse in the process of transforming bourgeois society into a socialist society, or the Stalin regime is the first stage of a new exploiting society. If the second prognosis proves to be correct, then, of course, the bureaucracy will become a new exploiting class. However onerous the second perspective may be, if the world proletariat should actually prove incapable of fulfilling the mission placed upon it by the course of development, nothing else would remain except only to recognise that the socialist program, based on the internal contradictions of capitalist society, ended in Utopia. It is self-evident that a new “minimum” program would be required — for the defence of the interests of the slaves of the totalitarian bureaucratic society.”²⁵

²⁵ Trotsky, Leon, *In defense of Marxism*, Pioneer Publishers, New York, 1942, p. 9.

CHAPTER V

The law of uneven and combined development¹

Louis Althusser and Maurice Godelier have endeavoured to incorporate structuralism into Marxism. The first has criticised Hegel and, in passing, some aspects of Engels, based on that method.

For Hegel, according to Althusser, the “contradiction is never *really overdetermined*, even though it frequently has all the appearances of being so. For example, in the *Phenomenology of Mind*, which describes the ‘experiences’ of consciousness and their dialectic, culminating in Absolute Knowledge, contradiction does not *appear* to be simple, but on the contrary very complex. Strictly speaking, only the first contradiction — between sensuous consciousness and its knowledge — can be called simple. The further we progress in the dialectic of its production, the richer consciousness becomes, the more complex is its contradiction. However, it can be shown that this complexity is not the complexity of an *effective overdetermination*, but the complexity of a cumulative *internalisation* which is only apparently an overdetermination. [...] However, none of these determinations is essentially outside the others, not only because together they constitute an original, organic totality, but also and above all because this totality is *reflected in a unique internal principle*, which is *the truth* of all those concrete determinations. [...] We have only to ask why Hegel thought the phenomena of historical mutation in terms of this *simple concept* of contradiction, to pose what is precisely *the essential question*.”²

That is, for Althusser, Hegel, in fact, always works on a specific moment with a single contradiction, in which, as a memory, as reminiscence, all previous contradictions accumulate. According to him, the dialectic of Marx is different (many contradictions in a structure, of which one is “overdetermined”, that is, it is determinant and determined by all the others). Marx — he thinks — leaves nothing of Hegelian simplicity.³

Godelier follows in his footsteps by proposing not only the relationships between contradictions within a structure but those of the structures within a system. Both of them, dazzled by finding the laws of structures, fall victim to formalism. Godelier, for example, defends the “priority of the study of structures”.⁴ Althusser tends to forget the dynamics of contradictions and their mutual relations, making these relationships always equal, basically static, the “overdetermined contradiction” it does not change. In order to better understand our criticism, let’s bring it down to earth.

1 For readers unfamiliar with Marxist thought and its different currents, we hasten to make the following clarification: it is called by this name the law discovered by Trotsky to explain the peculiarities of backward countries that “combine” “unevenly developed” segments, for example, a modern industry in some branches with feudal relations in the countryside or in other branches.

2 Althusser, Louis, *For Marx*, The Penguin Press, London, 1969, p. 101, 102, 103.

3 “But if every contradiction appears in Marxist historical practice and experience as an overdetermined contradiction; if this overdetermination constitutes the specificity of Marxist contradiction; if the ‘simplicity’ of the Hegelian dialectic is inseparable from Hegel’s ‘world outlook’, particularly the conception of history it reflects, we must ask what is the content, the *raison d’être* of the overdetermination of the Marxist contradiction, and how can the Marxist conception of society be reflected in this overdetermination.” (Althusser, Louis, *For Marx*, op. cit. p. 107.)

4 Quoted by Piaget in *Structuralism*, op. cit., p. 127.

Althusser does not hide his admiration for Mao Tse-tung and his theory of contradiction as an example of his method in the practical-political field. For Mao, there are at a historical moment antagonistic and non-antagonistic contradictions, related to each other. When Japan invaded China, for example, the antagonistic contradiction was China-Japan, and the non-antagonistic contradictions as Chinese bourgeoisie-proletariat, etc. were subordinated to it. This conception leads to the theory of the revolution by stages — one bourgeois-democratic, another socialist — and not the combination of stages. Until an antagonistic contradiction, imperialism-China or feudalism-bourgeoisie in Russia is not solved, contradictions cannot be transformed from non-antagonistic to antagonistic. It is a mechanical criterion that does not take into account changes in the relationships between contradictions when in reality contradictions have among themselves contradictory relationships and momentary, unstable, dynamic combinations. This means that sooner or later, the antagonistic contradiction (the bourgeoisie and Chinese landowners) will join their antagonist (imperialism), becoming non-antagonistic, leaving the proletariat and the peasantry alone to face them all, as the antagonist of all exploiters.

Mao and his admirer have not been able to assimilate structuralism to Marxism, to the depths of it. In this sense, they have not followed the precious indications of Marx.

1. Marx

In the *Outlines of the Critique of Political Economy*, Marx says: “In general, the concept of progress is not to be taken in the usual abstract form.” And, not satisfied with it, he states: “*The unequal development of material production and e.g. art.*” “[...] this disproportion is not so important and not so difficult to grasp as within practical social relations themselves, e.g. in culture. Relation of the *United States* to Europe. However, the really difficult point to be discussed here is how the relations of production as legal relations enter into uneven development. For example, the relation of Roman civil law (this applies in smaller measure to criminal and public law) to modern production. *This conception appears to be an inevitable development.* But vindication of chance. How. (Of freedom, etc., as well.) (Influence of the means of communication. World history did not exist always; history as world history is a result).”⁵

Marx was aware that, as a minimum, in some structures there was “unequal relation” and “uneven development” between different social categories: “material production”, “artistic production”, “relations of production”, “legal relations”, etc.

This conception of an “unequal development” and not only of “development” is relatively constant in Marx and he applies it not only to the relations between the “economic structure” and the “artistic or legal superstructure”, but also to the economic field.

Referring to the conquests, he says: “Conquests may lead to either of three results. The conquering people imposes its own mode of production upon the conquered (for example, the English in Ireland during this century, and partly in India); or it allows the old mode of production to continue and contents itself with tribute (e.g. the Turks and Romans); or interaction takes place, giving rise to something new, a synthesis ([this occurred] partly in the Germanic conquests). In all cases it is the mode of production — whether that of the conquering people or of the conquered or that brought about by a merging of the two — that determines the new mode of distribution that is established.”⁶

Many years later, in *Theories of Surplus Value*, he characterises the colonization in the plantations in the following way: “In the second type of colonies — **plantations** — where commercial speculations figure from the start and production is intended for the world market, the capitalist production exists, although only in a formal sense, since the slavery of Negroes precludes free wage labour, which is the basis of capitalist production. But the business in which slaves are used

5 Marx, Karl, “Outlines of the Critique of Political Economy (Rough draft of 1857-58)”, *Marx & Engels Collected Works*, Vol 28, op. cit., p. 46.

6 Ibid, p. 35.

is conducted by capitalists. The mode of production which they introduce has not arisen out of slavery but is grafted on to it. In this case, the same person is capitalist and landowner.”⁷

The general laws, not only of the capitalist structure but of its crises, caused by the uneven development of its different sectors, had already been seen by Marx when he stated: “The result at which we arrive is, not that production, distribution, exchange and consumption are identical, but that they are all elements of a totality, differences within a unity. Production is the dominant moment, both with regard to itself in the contradictory determination of production and with regard to the other moments.”⁸

We will not say Marx explicitly formulates a new theory with different laws but he does point out clearly: first, that there is an uneven development among the different branches of society; second, that there are in some structures unequal relations, a “synthesis” or “fusion”; third, that some “new” structures or “systems” or “modes” of production are products of that “fusion” or “insertion” of one mode of production into another; fourth, that this development provokes crisis; and fifth, it poses, without solving it, the relation between “necessity” and “chance” in that “non-abstract” “progress”. That is, he was about to discover the theory that makes an epoch in Marxism: the theory of uneven and combined development, which explains scientifically the relationship between genesis and structure.

2. Trotsky

It was Trotsky, driven by the need to specify the general characteristics of Russia (structure) and the historical dynamics (genesis) that led to the revolution of February first and of October after, who came to formulate explicitly the famous theory. We say he was his discoverer. From its many expressions, we collect the one he gives in his *History of the Russian Revolution*.

“The laws of history have nothing in common with a pedantic schematism. Unevenness, the most general law of the historic process, reveals itself most sharply and complexly in the destiny of the backward countries. Under the whip of external necessity, their backward culture is compelled to make leaps. From the universal law of unevenness thus derives another law which, for the lack of a better name, we may call the law of *combined development*-by which we mean a drawing together of the different stages of the journey, a combining of separate steps, an amalgam of archaic with more contemporary forms. Without this law, to be taken of course in its whole material content, it is impossible to understand the history of Russia, and indeed of any country of the second, third or tenth cultural class.”⁹

Trotsky limited the scope of his theory to historical analysis, mainly of the backward countries, which is not accidental since he was a revolutionary who did not have time to specialise in questions of method or epistemology. In any case, the theory, foreseen by Marx, reached with him an express formulation.

3. Piaget

It would be interesting to draw a parallel between these two giants of thought, which are Trotsky and Piaget. We would find many points in common. Both are more “practical scientists” than “speculators”. One had as experimental field nothing less than the world, after having led, along with Lenin, the most radical change humanity had known. The other had man and all knowledge, from his birth to his maturity. Ignoring themselves they came to the same theory. We have to add, however, that Piaget does not formulate explicitly, like Trotsky does, this law, or

7 Marx, Karl, “Theories of Surplus Value”, *Marx & Engels Collected Works*, Vol 31, Lawrence & Wishart, London, p. 516.

8 Marx, Karl, “Outlines of the Critique of Political Economy (Rough draft of 1857-58)”, *Marx & Engels Collected Works*, Vol 28, op. cit, p. 36.

9 Trotsky, Leon, *The History of the Russian Revolution*, Simon and Schuster, New York, 1937, pp. 5-6.

with another name. In his two works dedicated to genesis and structure, already mentioned, he merely reiterates that there is an intimate unity between the two categories and that is “balance”. In *Genetic Epistemology* and in *Biology and Knowledge* he describes the operation of the law but without naming it. But such is the importance he gives to this description that we allow ourselves to equate it with Trotsky and affirm that, in a sense, he has surpassed it. To paraphrase Hegel, we could say Piaget knows but does not acknowledge the law. This lack of recognition causes gaps in his theories and explanations but does not take away the merit of having been the first to describe its functioning in the biological, psychological, and knowledge world.

For this author, “in organic or ontogenetic development” “it can be admitted” “that by and large, integration is proportional to differentiation, and sooner or later is bound to prove a necessary complement to it”.¹⁰ He adds: “In the first place, as has already been said, organic or individual development brings together, into one functional whole the processes of differentiation and integration, whereas in genealogical these are relatively distinct.”¹¹ “In the case of phylogenesis, we are confronted with what may be called a ‘genealogical’ or collective development by means of the formation of successive branches growing out the common tree or twigs growing from the branches. In this case, there are, of course, transformations arranged in a time sequence, and they follow certain clear paths when studied in the context of the main lines of development: that is in the dual direction of differentiation and integration.”¹² “But most schemata instead of corresponding to a complete inherited apparatus, they are built up a bit at a time, and even give rise themselves to differentiations, by adaptation to a modified situation or by multiple and varying combinations (for example, reciprocal assimilations with or without new accommodations).”¹³

4. The new according to Piaget

Sartre and other anti-Engelsians criticise Engels for arguing that the Hegelian law of leap of quantity into quality explains the newness, the emergence of a new existence. These authors point out a certain fact: the aforementioned law can never explain the emergence of the truly new. The leap of quantity into quality explains the changes of form within what already exists, of what has already been born. The famous example of water confirms this. Water at 20°C is liquid, at 100°C it is gaseous. and at 0°C it is ice, but it is always H₂O, it is not a new element; only its form has changed. A man or a woman may be older but they will remain the same; they are that person but young or old, and never another.

What is, then, the new? Piaget, in his epistemological investigations, describes the emergence of the new. Until him all the explanations were of two types: “preformists” (the new was already in the old) or “emerging” (the new was not in the old, it was completely “new”, “random” or “emergent”). Piaget synthesises the two traditional positions in a third: “On the other hand, by the very fact that they serve as subject to new overall compositions (to new systems of operations) the elements abstracted from the previous operations may remain difficult to recognise, because of the adjunction of the new characters born of this composition.”

“What then is this adjunction, source of the new? The elements abstracted from the previous actions or operations, rendered independent (or differentiated) by this abstraction itself, give rise to a new operative composition of the whole, different from the previous composition of which they were a part. An element abstracted from a previous system can certainly not give rise to the elaboration of a new system by itself: it is by combination or put in relation with other elements, abstracted from other sets, that it engenders the composition not contained in the preceding ones.”¹⁴ “In addition, and this is equally essential for the understanding of the genetic process,

10 Piaget, Jean, *Biology and Knowledge*, op. cit., p. 72.

11 Ibid, p. 80.

12 Ibid, p. 71-72.

13 Ibid p. 8.

14 Piaget, Jean, *L'épistémologie génétique*, T III, p. 302 and 303.

this combination between elements abstracted from the previous systems does not consist in a simple association: the synthesis is not carried out and is not actually a construction other than to the extent in which these elements give rise to an entire operative composition, with its set of properties”, “new construction” that becomes “irreducible to each of its elements set apart”.¹⁵

We consider this a description of the genesis of the new in knowledge but our question, “what is new?”, remains somewhat unanswered. The law of uneven and combined development is the only one that explains the emergence of a new structure, in addition to the changes within it, which had already been explained to some extent by the leap of quantity into quality. Only the combination of the unevenly developed will originate a new structure. Returning to the example of man and woman, we will say that the union of the two is necessary for the emergence of a new being. If we stayed in the leap of quantity into quality, we could only talk about the development of the embryo, but where does it come from? Of the combination of ovum and sperm and that is the answer, not its later development, because the embryo is already the new being.

As we have already seen, Piaget has described this law of uneven and combined development as an explanation of the new in his epistemological investigations. He also glimpsed it as an explanation of the new forms in the organic world, saying: “The deep reason for this continuity is that such a perpetual creation of new forms with rebound on the elements that are proper to all biological development (organic or mental): differentiation and complementary integration.”¹⁶ What he has not done, has been: 1) formulate it; 2) generalise it;¹⁷ 3) understand that this law (of the uneven and combined development or, for him, of “differentiation-integration” at the organic level or “abstractive-constructive” at the level of thought or of “combination” in general, is the one that unifies genesis and structure, and, therefore, is the law of balance and imbalance between the two.

5. A popularisation pamphlet that is much more than that

Novack has written a pamphlet or “essay” popularising the law of uneven and combined development that far exceeds the modest framework he imposed on it. He begins: “This essay aims to give a connected and comprehensive explanation of one of the fundamental laws of human history. This is the first time, to my knowledge, that this has been undertaken.”¹⁸

Pages later and in passing, he synthesises what we have tried to demonstrate in this prologue. That, “although directly originated in the study of modern history, the law of unequal and combined development is rooted on features common to all processes of growth in nature as well as in society.”¹⁹ And “this law enables us to observe how the new qualities arise.”²⁰

The only thing that could be added to these few phrases of such importance is that for us the law of uneven and combined development is the most important discovered by Marxism and

¹⁵ Ibid, p. 303.

¹⁶ Ibid, p. 306.

¹⁷ In a previous work (*The Chinese and Indochinese revolutions*, Ediciones El Socialista, Buenos Aires, 2015, page 4 — available for download at www.nahuelmoreno.org) we said: “Marxism has posed from the beginning the problem of a scientific and historical law to explain the leap to the new. It found a general law in the jump of quantity into quality of Hegel, brought down to earth by Marx and Engels. The dialectic discovered by Marx between the development of productive forces, the relations and struggle of classes and the superstructure, is the ultimate key to the revolutionary transformations of a society into another. These, however, do not explain fully the new in history and the world.

“Trotsky, with his discovery and formulation of the law of uneven and combined development, manages to give a more general law for understanding the emergence of the new: it is the combination or crisis of unevenly developed segments of society. The jump of quantity into quality is to the law of uneven and combined development what the law of gravity is to the law of relativity.”

¹⁸ Novack, George (writing as William F. Warde), *Uneven and combined development in history*, Pioneer Publishers, New York, 1965, p.5.

¹⁹ Ibid, p. 8 and 9.

²⁰ Ibid, p. 25.

modern science, as the theory that unifies the genetic and structural laws. It allows us to give us a new law of the emergence of the new, much richer and more correct than the leap of quantity into quality. Finally, that this law is not only objective but logical; it gives unity to Marxist logic by allowing us to structure genetic laws with structural ones. For historical reasons, we have respected the name that the formulator gave to this theory. That is why we commonly say law and not a theory as appropriate. Indeed, because it combines and unifies different laws in a structure, it is a theory and not a law. Thus, it explains, among other things, the laws of the disappearance of the old, the emergence of the new, the transformations and internal contradictions of a structure, the form of this, etc.

It has been a pity that Novack's book on logic has not incorporated this conclusion into his interpretation of the history of logic, which, therefore, must be contradictory and of unequal and combined development.

CHAPTER VI

A new approach to the history of logic

For Piaget, all the great theories of knowledge reflect and generalise reflections on one or several sciences. As a consequence of the incorporation of the concept of knowledge understood as construction, the history of epistemology is divided in two: on the one hand, passive or contemplative schools or thinkers; on the other, the constructivists.

Among the first are included Greek epistemology (which believed knowledge was achieved directly by intuition or the senses). Here Plato's theory stands out as reflecting mathematics, and that of Aristotle reflects biology and the most elementary formal logic.

Piaget argues that constructivism begins with Descartes and Leibniz, whose epistemologies are linked to the physics-mathematical construction. The empiricists anticipate the psychology of learning (the subject is constructed by the influence of the outside world); Kant reflects the mathematical construction of Newtonian physics; Hegel pre-announces the method of the social-historical sciences.

Something similar must be done with logic since contemporary Marxism has been imprisoned by a conception that seems to us ahistorical and anti-dialectic. Ahistorical because by making the division between a formal logic, which has not been modified for 25 centuries, and another dialectic or concrete logic, founded by Hegel, starts from the fact that in the time between them nothing happened in the field of logic. Anti-dialectic because it begins that there could be formal sciences (logic amongst them), without there being, at the same time, a concrete logic, that is to say, that there were no methods to know the object.

Can we admit, perhaps, that only two, or at most three, logics have existed in 2500 years if we consider Marxist or Galilean logic as new? A problem similar to ours is posed by contemporary biologists.¹

Piaget recognises the close connection between formal logic, epistemology, and the methods of each science. He argues that logic and mathematics — which are related to each other — are formal (they build pure structures); that epistemology, in a second approximation, is the “study of the passage from states of minimum knowledge to those of more rigorous knowledge”;² that, on the other hand, “logic is nothing without an applied logic”; that “epistemological reflection always arises from the ‘crises’ of this or that science, and that these ‘crises’ result from a gap in the previous methods, which will have to be overcome thanks to the invention of new methods.”³ And he insists: “Logic is nothing without an applied logic.”

1 This is the traditional division of life in the animal and vegetable kingdoms, which has begun to be questioned. (Whitaker, Robert Harding, “New Concepts of Kingdoms of organisms”, “Evolutionary relations are better represented by new classifications than by the traditional two kingdoms.” *Science*, New York, Vol. 163, issue 3863, 10 January, 1969.

2 Piaget, Jean, *Lógica y conocimiento científico* [Logic and scientific knowledge], op. cit., p. 18.

3 Ibid, p. 19.

The question is whether “the methodology”, that is, the union of the different methods in a general one, can be considered “an independent branch” and a great science (which we could call concrete logic or general methodology of the objective sciences). Piaget is resounding in this regard: “But if the consideration of the methods is, then, fundamental, the methodology cannot be considered, however, as an independent branch, possessing the same organic unity that logic and epistemology possess, and this is precisely because when these two disciplines are considered, we are, of course, with the constant presence of problems of method.”⁴

The other problem is whether there is an even more general method, which encompasses this concrete logic, the formal sciences, and epistemology. As we see, it presents us with a circle; formal logic and epistemology are tributaries of the methodology or applied logic, and the latter of the first but... what does it give us unity? What explains them as a whole? In the case of the circle of sciences, unity is given by epistemology; but, is there a characteristic method of genetic epistemology?

This vacuum in the explanation is permanent; it is the same one we see between structure and genesis — the law of equilibrium between these two poles remained undefined, although he described it as the law of uneven and combined development. In the same way as on that occasion, Piaget approaches, nevertheless, a solution, when he says: “[...] yet, as such becoming, it does not consist in a merely contingent succession but in a process of integration and equilibration — therefore, in a real and rationally lived dialectic —, it means that historical dialectics can, simultaneously and with no contradiction, concern the historical-critical analysis and the formalising analysis.”⁵

We believe that for over a century both a logic and a concrete epistemology have been elaborated, with all the characteristics of organic, unitary sciences. This new science, the modern concrete logic, is the Marxist logic, which has not yet been systematized and this is why it is lagging the other sciences — in this sense Piaget is right — but it exists and is being built. With it, the same thing will happen that happened with epistemology, which only in the last 20 years has begun to systematize as a true independent science, and precisely with the works by Piaget.

If we accept that there are three types of knowledge — one of the object (of objective sciences); another, of the internalised actions (logical-mathematical); and a third, the innate (of very little importance) — we face the problem of the link between the first two and within that link, as a specific issue, the problem of the relationship of the methods of objective sciences with formal logic or, rather, with the formal sciences.

This relationship, in turn, poses three problems:

- a) How concrete logic or methodology is related to the formal sciences and epistemology;
- b) What combinations have been established at each stage of the development of philosophy and science; and,
- c) How each sector develops unevenly and, in each of them, its different segments (formal logic and mathematics within the formal sciences, physical, biological and socio-psychological methods, on the other hand).

We will deal with point c) it later, although in passing and without further details.

Regarding the relations between both logics, between the formal and objective sciences, there is a close relationship,⁶ although the objective ones are richer, more complex than the formal

4 Ibid, p. 19.

5 Ibid, pp. 111 and 112.

6 “With this in mind, if the cognitive structuring thus begins at the periphery of the organism by means of actions and with beginnings of awareness depending on the extent of their controls, we then understand the close solidarity of the progress, or of its delay, is understood in the double direction of the conquest reality with causality, and the development of controls and operations, which are the internal coordinations of the subject. We understand in particular that for every progress of these endogenous structures, proceeding by reflexive abstractions, there is a corresponding refinement of the experiment and of physical or simple abstractions and conversely, there is a complementary solidarity of those two modes of abstractions that, in the end, is only the expression of two interdependent movements, although going in opposite directions, of externalization in the grasping of the real

ones, since they require a combination of their specific methods (observation, experimentation, etc.), with the formal, logical-mathematical. This close solidarity between the objective sciences with their methods, with the formal sciences leads us to ask ourselves about the relationships they establish at each stage of the history of science and philosophy, a problem that Piaget indirectly raises but leaves unanswered.

We see, for example, in Greek times, next to formal logic and mathematics, a primitive concrete logic (knowledge always tried to apprehend the external world). And the history of sciences, in general, shows us that in all the stages of knowledge both logic and mathematics have been always intimately linked. Leaving aside the splitting criterion we criticise, and addressing it, on the contrary, with this approach, we will have a much richer and more complex history of uneven and combined developments between both logics, mathematics, and epistemology. In schematic form, and in response to b), this is what we will try to do next.

1. Aristotelian logic and epistemology

The apparent contradiction of Aristotle, which consists in being, on the one hand, the master of the empiricists — the expression *tabula rasa* corresponds to him to a certain extent⁷ — and, on the other hand, the initiator of formal logic, is overcome with our approach. The concrete logic of Aristotle is based on a static method (observation) combined with a rudimentary formalisation, of classes or concepts, which allows us to achieve the most primary classification, definition, and deduction.⁸ Hence, his is a logic of the common qualities of objects, i.e., of the properties that man observes and places in relations to classify. Let us not forget, however, that against what Aristotle could believe, observing means that both properties and objects exist, but that only the human activity of gathering and separating can put in correspondence.

One of the best scholars and commentators points out that, for Aristotle, the method that allows us to grasp the first premises of each demonstration “we start with humbler a faculty from which this knowledge may be developed. Such a faculty Aristotle finds in perception, the discriminative power inborn in all animals. The first stage in the development from sense to knowledge is memory, ‘the remaining of the percept’ when the moment of perception is over. The next stage is ‘experience’, or the framing, on the basis of repeated memories of the same kind of thing, of a conception, the fixation of a universal”;⁹ “it is clear then that it is by ‘induction’ (i.e. by generalisation from particulars) we recognise the ‘first things’; for it is thus that perception too produces the universal in us.”¹⁰

This vindication of the senses explains the admiration for Aristotle professed by the Dellavolpian school that, relying on Friedrich Adolf Trandelenburg, vindicates him against Hegel. It is the logic of common sense. When Lévi-Strauss describes the way of classifying some savage tribes, he is describing Aristotelian concrete logic.¹¹

and of internalisation in the construction of the instruments of assimilation.” (Piaget, Jean and Garcia, Rolando, *Understanding Causality*, WW Norton, New York, 1971, pp. 137-138.)

7 “[...] the intellect is, in a way, the intelligible potential, but it is not in fact, before thinking. It must be in it, then, as in battle, in which nothing is already written, in act and this is precisely the case of the intellect” (Aristotle, *De Anima*, III, 4, 429 cited by Rodolfo Mondolfo in *El pensamiento antiguo* [The thought of antiquity], Losada, Buenos Aires, 1952, T. II, page 64).

8 The simplest classification, from gender to species. The definition by next gender and specific difference, and syllogistic deduction. In the same way, the two essential characteristics of the concept, extension and comprehension, are achieved. Contrary to what has been believed that in Aristotelian logic there was no quantity and only quality, modern studies have discovered four quantifiers: one, all, some, and none. Very primary and qualitative quantities, but quantities all the same.

9 Ross, William David, *Aristotle*, Methuen & Co., London, 1949, pp. 54-55.

10 Ibid, p. 55.

11 Lévi-Strauss, Claude, *The Savage Mind*, University of Chicago Press, 1968, Chapter 1.

Together with this concrete logic, Aristotle gives us the formal logic of a structure of concepts and the operations that can be performed within that structure. This is why the discussion about whether the fundamental thing is the judgment, as some authors think, or the concept (Lefebvre) is false since what is decisive is the formal structure that involves the judgment or the concept as an indissoluble part of the structure. You cannot have the concept man = rational animal if we do not have the concepts of irrational animal and animal, that is, the overall structure, which makes judgments to specify the concepts in a hierarchy of concepts suitable for making judgments.

2. Experimental logic

From this concrete logic, a combination of formal logic with observation, we must move on to a development in which the concrete logic and the formal sciences become independent. The observation of the relationships between objects will give rise to an empirical logic, discoverer of laws. Without being combined with observation, the formal sciences will be developed as geometry and as algebra in the Greek and Arabic world, respectively.

According to some epistemologists, empirical logic is Bacon's attempt, not only to observe the phenomena and relations between the objects but to combine those observations with a formal science, the bourgeois law (did Bacon try to submit his observations to legal evidence?) We do not know whether this is so but in any case his merit is to have overcome the classification of Aristotle's concepts by replacing the perception of the object's qualities or properties with the observation of the relations between them — laws — although it remains, in some sense, a concrete logic of observation.

A truly spectacular leap in this development takes place with Galileo Galilei — so dear to Della Volpe's school — who discovers a new logic, the experimental. New, we say, because it combines the empirical logic of observation of the phenomena with two methods developed in other branches of formal knowledge: the possible or hypothesis and the measure (a category of geometry). The experimental logic, as summarised by Lodovico Geymonat, is characterised by three methods structured in a whole: 1) a hypothesis; 2) a unit of measurement to measure the phenomenon; and 3) an experiment, i.e., a conditioned observation, prepared to measure and corroborate the hypothesis.¹²

This new concrete logic, a product of a new combination of observation with formal sciences, geometry, and the logic of the possible will allow the fabulous development of the natural sciences in the last few centuries. This logic already means an overcoming of the Aristotelian and Baconian observations; it inaugurates in a sense modern logic by initiating hypothetical-deductive logic with formal structures of propositions and by mathematising the observation. But it is only the beginning since it is still clinging to observation and the formulation of a single hypothesis, although combined with measurement, i.e., with mathematics.

But this logic, although of an incomparable richness, was only a logic of the phenomena, of certain aspects of reality; it did not serve to explain the historical or genetic processes or the segments of reality in general (as a whole) or the production of thought. The time is approaching for a new logic of the genesis and the totalities of reality, such as the production of thought.

12 "Galileo's method consists essentially of three moments: 1) Search for measuring instruments capable of matching the phenomena of precise numbers (among the most important measuring instruments used by Galileo let us recall the pendulum, the thermometer, etc.) [...] 2) The second step of the Galilean method consists of the formulation of a hypothesis, but not of a general nature on the whole course of phenomena but on the particular phenomenon examined: it must have a mathematical character and be as simple as possible [...] 3) The third step of the Galilean procedure consists in the verification or 'information' of the consequences of the referred explanatory hypothesis. In relation to the third step, now explained, Galileo proposes one of the most interesting resources of his method. Nature is not always able to spontaneously give us the means to carry out the test; if it does not offer it spontaneously, it will be our responsibility to intervene on it by provoking it. Our intervention will consist of projecting models that oblige nature to tell us explicitly whether or not it obeys the hypothesis formulated [...]" (Geymonat, Lodovico, *Scientific Methodology*).

3. German idealism

Della Volpe does not believe in the constructive role of thought. He ignores this discovery and, consequently, all that derives from it. So for him, all logics end with Galileo's experimental logic; after Galileo, nobody has contributed anything and, therefore, all the development of the sciences must be attributed to it. This is false since Galileo is between two epochs; it is Descartes who begins this series of discoveries that will culminate with Hegel.

Descartes points out that there are innate ideas together with adventitious ideas; that "absolutely every item of knowledge which [man] does not acquire through the simple and pure intuition of a single object in isolation, is obtained through the comparison of two or more with each other" (Rule XIV).¹³ That is, "the nature of our mind is such that it generates propositions from its knowledge of particulars".¹⁴ It is the subject who "compares" or "forms" to arrive at the truth. Hence his contempt for the syllogistic method of Aristotle: "this method of reasoning has no use for the knowledge of the truth" (Rule X).¹⁵ What Descartes does is to generalise the experience of the physics of his time and the mathematics he discovered: the analytic (synthesis between algebra and geometry) that opened unsuspected possibilities to mathematical thought. This comparison was a "construction" of thought and that is the reason Descartes discovers the subject as a producer of knowledge, although only of mathematical knowledge.

Something similar happens with Gottfried Wilhelm Leibniz; he gives more importance than anyone to the construction possibilities of thought, as a consequence of his discovery of the algebra of the infinite. Hence his famous response to the empiricist aphorism: "Nothing is in the intellect that was not first in the senses, except the intellect itself."

Immanuel Kant attempts to carry to its ultimate consequences the constructor role of the subject in relation to mathematics, reasoning on the physics of Newton who, surprisingly, achieved that his famous mathematical formulas on gravitation were applied to different physical fields. Hence, like Descartes, he distinguished the philosophical from the mathematical method. "A universal concept can be arrived at in two ways: either by the *arbitrary combination* of concepts or by the *delineation* of a certain conception which has been elucidated by an analysis. Mathematics only establishes definitions in the first way. It is clear that in this case, the definition results from *synthesis*. But for philosophical definitions, the situation is completely different happens. Here the notion of a thing is already given although it be vague and lacking an adequate determination. It is necessary to analyse it."

"... philosophical definitions are never more than expositions of given concepts, mathematical definitions are constructions of concepts, originally framed by the mind itself, and that while the former can only be obtained by analysis [...] the latter are produced synthetically."¹⁶

In contrast to mathematical entities, the object, the thing, cannot be constructed or known by thought. It is a "thing in itself"; only the phenomenon is apprehended and distorted by the categories of the subject.

From Kant, its founder, German idealism is divided into two conceptions: those of Johann Gottlieb Fichte and Friedrich Wilhelm Joseph Schelling.

The first unilaterally develops the constructive role of the subject, elevates it to a speculative method that, in a certain sense, will be that of Hegel: the self (the subject) advances through negations, overcoming oppositions.

13 Descartes, René, *Rules for the direction of the mind*, Liberal Arts Press, 1961, p. 68

14 Descartes, René, *Meditations and Other Metaphysical Writings*, Penguin Classics.

15 Descartes, René, *Rules for the direction of the mind*, op. cit., p. 17.

16 *Untersuchung Uber Die Deutlichkeit Der Grundsätze Der Natürliche Theologie und Der Moral* [Inquiry into the Distinctness of the Principles of Natural Theology and Morals] and *Critique of Pure Reason* by Immanuel Kant, respectively cited by EW Beth in *Mathematical Epistemology and Psychology. Essay on the Relationships between Formal Logic and Real Thought*, op. cit., p. 13.

Schelling poses the problem of the relationship between nature, life in general, and thought (“Every plant, for example, is a symbol of intelligence”). But the relationship between thought and nature is found in the intellectual intuition that produces its object in opposition to sensible intuition, for which it is given.

Hegel surpasses Schelling’s proposal by putting thought instead of intuition and generalising Fichte’s method (development through contradictions).

4. Hegel’s discovery

Hegel synthesises the contributions of Kant, Fichte, and Schelling to the new historical-sociological dimension reasoning on the consequences of the French Revolution and not only on the results or possibilities of a science, like his predecessors.

Until him, the different idealist epistemologies had been raised to achieve a theory of knowledge or a method to explain the construction of mathematics with Kant, of the subject in general with Fichte, and trying to identify the spirit with organic life through intellectual intuition with Schelling. Hegel, instead, seeks a method that serves to capture all that exists, including human history with its great event — the French Revolution and the Restoration. Previously, each science had its own methods of capturing the specific object and, moreover, there was, on the other hand, a formal logic that taught to reason coherently. Thus we can point out as his first great merit trying to achieve a method of reasoning that allows us to capture all the contents. Hegel’s is the first concrete logic formulated consciously. This is why he says: “[the method] is not something distinct from its object and content; for it is the inwardness of the content, the dialectic which it possesses within itself, which is the mainspring of its advance. It is clear that no expositions can be accepted as scientifically valid which do not pursue the course of this method and do not conform to its simple rhythm, for this is the course of the subject matter itself.”¹⁷

Logic is “the knowledge of the content itself” and in the *Logic*, he insists: “It is only after profounder acquaintance with the other sciences that Logic ceases to be for subjective spirit a merely abstract universal and reveals itself as the Universal which embraces within itself the wealth of the Particular [...]. Thus the value of logic is only apprehended when it is preceded by experience of the sciences; it then displays itself to mind as the universal truth, not as a particular knowledge alongside other matters and realities, but as the essential being of all these latter.”¹⁸

But, how to capture the object? And here is his most important discovery. Kant said the object, the “thing in itself”, cannot be known, and the previous epistemologies said it was known by perception or by a capturing. Hegel says it can be known but by building knowledge and its object and that this thought is my activity. Continuer of Descartes and Kant, who discovered that thought constructs mathematics, he (“manufactures”) generalises this discovery to everything existing, from social history to objects with their relationships, affirming it is thought that “manufactures” them.

Thus he destroys the strongest evidence of common sense — that knowledge begins with an absolute certainty of the existence of the object and is developed by analysing, discovering, the properties and relationships of this object. He holds the opposite: that knowledge, only at the end of its construction, “as a result” will have the object, the concrete and, therefore, it does not advance through an analytical path, it starts from a certain global knowledge of the object and it is being perfected but by previous abstractions or analyses which are synthesised in increasingly rich constructions, until achieving the object or the concrete in its totality, with its relations and properties.

“The relation contained in something concrete, in a synthetic unity, is necessary only in so far as it is not just given but is produced by the spontaneous return of the moments back into

¹⁷ Hegel, Georg, *Wissenschaft Der Logik* [The Science of logic], Vol 1, Felix Meiner Verlag, Leipzig, 1951, p. 36.

¹⁸ Ibid, p. 40. This movement is “the absolute method of knowledge, and at the same time, the immanent soul of the Content itself”.

this unity — a movement which is the opposite of the analytical procedure, which is an activity belonging to the subject–thinker and external to the subject matter itself.”¹⁹

“The true nature of the object”, then, is given only by the “operations” of the subject: “By the act of reflection, something is *altered* in the way in which the fact was originally presented in sensation, perception, or conception. Thus, as it appears, an alteration must be interposed before the true nature of the object can be discovered. [...] The real nature of the object is brought to light in reflection; but it is no less true that this exertion of thought is *my act*.”²⁰

Thus, the famous Hegelian expression of “substance as a subject”, i.e., content, but manufactured by man, becomes transparent.

If we analyse Hegel with our current knowledge, we will verify that he mixes or unifies characteristics, laws of construction of the object of knowledge, which are of fundamental importance and which he was the first to formulate. Clarified, then, that it is not Hegel who makes this analysis but us, we can point out that for him this construction of the object of knowledge has to achieve or fulfil two fundamental objectives or, rather, has two essential characteristics, from which arise the most important laws discovered by him. They are:

I

The construction must result in a whole or a totality of relationships and not a simple unity. Hegel does not believe in the existence of the merely individual, of atoms as simple units; he does not admit the existence of something that is not a whole formed by parts related to each other. This notion of totality, which in his time several sciences already used (the solar system in astronomy, the concept of organism in biology), is generalised by Hegel, raised as the supreme necessity of the method for capturing the existing. “For the method is nothing else than the structure of the whole in its pure and essential form.” The method is “realised as a part of a concrete whole”.²¹ “In the nature of existence as thus described — to be its own notion and being in one — consists logical necessity in general. This alone is what is rational, the rhythm of the organic whole.”²² “The truth is the whole. The whole, however, is merely the essential nature reaching its completeness through the process of its own development.”²³ “The process by which they are developed into an organically connected whole is Logic or Speculative Philosophy.”²⁴

Of course, then, science is also for him, as it was for Marx, a system, not a formulation of laws, but a totality of laws and categories, organically related. “[...] knowledge is only real and can only be set forth fully in the form of science, in the form of system”, he says in the Preface to *Phenomenology of the Mind*.

From this first characteristic of his method a series of fundamental laws arise:

a) Thought achieves the construction of this whole, by “mediating”, relating, or combining concepts with their properties, since “pure mediation is only pure relation without related terms”. “Thus the method constitutes the determinations of the Notion itself and their relations, which must now be considered in their significance as determinations of the method.”²⁵ “[...] because

19 Ibid, p. 60.

20 Hegel, Georg, *Enzyklopädie Philosophie* [Encyclopedia of the Philosophical Sciences], Felix Meiner Verlag, Hamburg, 1959, pp. 18 and 19.

21 Hegel, Georg, *Phänomenologie Des Geistes* [Phenomenology of the Mind], Felix Meiner Verlag, Hamburg, 1952, p. 502.

22 Ibid, p. 47.

23 Ibid, p. 21.

24 Ibid, p. 33. Thus, at the end of the *Phenomenology* he emphasises: “Truth is the content, which in religion is not as yet at one with its certainty. This identification, however, is secured when the content has received the shape of self. By this means, what constitutes the very essence, viz. the notion, comes to have the nature of existence, i.e. assumes the form of what is objective to consciousness. Spirit, appearing before consciousness in this element of existence, or, what is here the same thing, produced by it in this element, is systematic Science.” (Ibid p. 798.)

25 Hegel, Georg, *Wissenschaft Der Logik* [Science of logic], op. cit., Vol II, p. 487.

every relation is not such but when it exists between different things, in other words, when it involves mediation.”²⁶

The whole is the concrete as a movement of relations. This is why he summarises his method thus: “As we have remarked, the enunciation and exposition of such concrete beginning is a process of mediation which starts from one of the determinations and advances to the other, even though the latter returns to the first.”²⁷

b) The whole must have a reversible, circular character. “It becomes something mediated, and hence the line of the scientific advance becomes a circle.” “The essential requirement for the science of logic is not so much that the beginning be a pure immediacy, but rather that the whole of the science be within itself a circle in which the first is also the last and the last is also the first.”²⁸ Hegel again anticipates modern epistemology and psychology with this.²⁹

c) There is no pure unity, but as a totality of relations and unity of the contradictory; only this unity is the true one: “It is in this dialectic as it is here understood, that is, in the grasping of opposites in their unity or of the positive in the negative, that speculative thought consists.”³⁰ This is why unity is a result, a synthesis in thought: “The opposites are before the synthesis a completely different thing than after the synthesis; before the synthesis, they are opposites and nothing else; the one is that which the other is not, and the other that which the one is not.”

d) In the totality elaborated by the thought, we find as supreme law reciprocal action and not the relation of cause to effect. This reciprocal action is the “the original unity of substantial difference, and therefore absolute contradiction”.³¹

II

This construction of knowledge and the object of it is dynamic, genomic, “plastic”, it is passed from one concept to another in a perpetual movement where the only thing that remains is the movement and, as every construction is done in time, it has a history. “[Philosophy] is the process that creates its own moments in its course, and goes through them all; and the whole of this movement constitutes its positive content and its truth. [...] Appearance is the process of arising into being and passing away again, a process that itself does not arise and does not pass away, but is *per se*, and constitutes reality and the life-movement of truth. The truth is thus the bacchanalian revel, where not a member is sober; and because every member no sooner becomes detached than it *eo ipso* collapses straightway, the revel is just as much a state of transparent unbroken calm.”³²

“But this education and discipline of thinking by which it acquires plasticity and by which the impatience of casual reflection is overcome, is procured solely by going further, by study and by carrying out to its conclusion the entire development.”³³

This movement has its laws, which we will summarise as follows:

a) This genesis is contradictory. It progresses through negations; thus it is possible to constitute the whole with a movement that is the product of successive negations, since “Contradiction is the root of all movement and life, and it is only in so far as it contains a Contradiction that anything moves and has impulse and activity.”³⁴

26 Ibid, Vol I, p. 60.

27 Ibid, p. 63.

28 Ibid p. 56.

29 With regards to thought tending to build reversible structures, of implication and not cause to effect. In some sciences and in some opportunities, complete reversibility is achieved, that is, a finished circle, a closed relationship structure, as in formal logic or mathematics.

30 Hegel, Georg, *Wissenschaft Der Logik* [Science of logic], op. cit., Vol I, §69.

31 Ibid, Vol II, p. 204.

32 Hegel, Georg, *Phänomenologie Des Geistes* [Phenomenology of the Mind], op. cit., Vol. I, p. 39.

33 Hegel, Georg, *Wissenschaft Der Logik* [Science of logic], op. cit., Vol I. p. 21.

34 Ibid, Vol II, p. 58.

“All that is necessary to achieve scientific progress — and it is essential to strive to gain this quite simple insight — is the recognition of the logical principle that the negative is just as much positive, or that what is self-contradictory does not resolve itself into a nullity, into abstract nothingness, but essentially only into the negation of its particular content, in other words, that such a negation is not all and every negation but the negation of a specific subject matter which resolves itself, and consequently is a specific negation, and therefore the result essentially contains that from which it results; which strictly speaking is a tautology, for otherwise it would be an immediacy, not a result. Because the result, the negation, is a specific negation, it has content. It is a fresh Notion but higher and richer than its predecessor; for it is richer by the negation or opposite of the latter, therefore contains it, but also something more, and is the unity of itself and its opposite. It is in this way that the system of Notions as such has to be formed — and has to complete itself in a purely continuous course in which nothing extraneous is introduced.”³⁵

b) These negations originate two methods or two stages in the movement of thought: understanding and reason (dialectical and positive). The first denies the simple, the object; the second denies the understanding, the positive reason to the dialectic reason. “The understanding determines, and holds the determinations fixed; reason is negative and dialectical because it resolves the determinations of the understanding into nothing; it is positive because it generates the universal and comprehends the particular therein. Just as the understanding is usually taken to be something separate from reason as such, so too dialectical reason is usually taken to be something distinct from positive reason. But reason in its truth is spirit which is higher than either merely positive reason, or merely intuitive understanding. It is the negative, that which constitutes the quality alike of dialectical reason and of understanding; it negates what is simple, thus positing the specific difference of the understanding; it equally resolves it and is thus dialectical. But it does not stay in the nothing of this result but in the result is no less positive, and in this way it has restored what was at first simple, but as a universal which is within itself concrete [...]”³⁶

Hegel, although imprecisely, anticipates here, with his famous categories of understanding and reason (dialectical and positive) those of modern epistemology of “simple or empirical abstraction” and of constructive abstraction and, also, the two methods of Marx: the one which goes from the “perceived concrete” to the simpler abstractions and the one which scientifically constructs reality by combining abstractions. On the one hand, “simple abstraction”, or understanding, fixes and separates properties, laws of a structure, of a whole, of what appears as “simple” and “constructive abstraction”. On the other hand, reason (dialectical or positive) is the one that combines those abstractions made by the understanding in order to “construct” the structure, the new “simple”, much richer than the previous one because it has been “constructed” or mediated, the intermediary being the dialectical reason that achieves the step from understanding to positive reason since when set in motion it dissolves what the understanding has fixed.

c) This genesis of knowledge leads to an improvement or enrichment through relative and non-absolute negations, since every dialectical overcoming (the famous Hegelian *aufheben*) is, on the one hand, conservation of something and suppression of something else. It is a surpassing by suppressing and conserving. “To sublata’ has a twofold meaning in the language: on the one hand it means to preserve, to maintain, and equally it also means to cause to cease, to put an end to. [...] The two definitions of ‘to sublata’ which we have given can be quoted as two dictionary meanings of this word.”³⁷

It is no accident that Hegel has just given this meaning to the word *aufheben* in his *Logic*, since in his earlier works, including the *Phenomenology*, he gave only a negative sense, as suppression or destruction. Instead, from *Logic* onwards, it acquires a new contradictory and positive sense. This concept, of overcoming suppressing and preserving, will find its culmination in Trotsky’s theory of uneven and combined development.

35 Ibid, Vol I, p. 58.

36 Ibid, p. 6.

37 Ibid, p. 94.

As every construction, it goes from the simplest to the most complex, from the parts to the whole. “[...] by that determinateness, cognition rolls onwards from content to content [...] beginning from simple determinatenesses the succeeding ones becoming ever richer and more concrete.”³⁸

This is why it is not surprising it was Hegel who has glimpsed the two methods that Marx points out in the *Outlines of the Critique of Political Economy* (which lead us from the concrete-represented to the thought) and which will originate the false Dellavolpian theory of a single method (the concrete-abstract-concrete circle): “In the notion, knowing itself as notion, the moments thus make their appearance prior to the whole in its complete fulfilment; the movement of these moments is the process by which the whole comes into being. In consciousness, on the other hand, the whole — but not as comprehended conceptually — is prior to the moments.”³⁹

e) As they are well known, we will not stop at the leap from quantity into quality, the negation of negation, laws that come in the genesis. Hegel, with these laws of the whole and of the genesis, although confused, has only given us a general theory of the deduction or construction of the object by thought, i.e., of the concept or idea.

³⁸ Ibid, Vol II. p. 502.

³⁹ Hegel, Georg, *Phänomenologie Des Geistes* [Phenomenology of the Mind], op. cit., p. 558.

CHAPTER VII

Marxist Logic

Both, the Marxist supporters of Hegel and those who deny him, disagree on his merits, errors, and importance. We believe an effort must be made to interpret Hegel from modern science and Marxism. Thus considered, his importance increases.

As we have already pointed out, he makes a fundamental discovery, the only method that allows us to know the external reality, producing it in thought. His mistake was to believe his method was the only one, which not only surpassed the previous ones but also subsumed them, nullified them. And, what is still more serious, that there was no possibility of achieving other superior methods. In this overestimation of his discovery he reached the extreme: to believe his method produced reality, not that it was the way in which thought reproduced it, that is, for him the method was not only omniscient but omnipotent.

This gives rise to all his other errors, mainly one that will mark all his conception: that the method makes it possible to overcome the contradiction and inequality between the subject and the object, the reality. If this inequality is not permanent, it is possible to overcome it, knowledge can have an end. He had correctly pointed out that in the sensible life of man there is an inequality between the external world and the subject: “The dissimilarity which obtains in consciousness between the ego and the substance constituting its object, is their inner distinction, the factor of negativity in general. We may regard it as the defect of both opposites, but it is their very soul, their moving spirit.”¹

But this dissimilarity is liquidated by thought, where “Being is entirely mediated; it is a substantial content, that is likewise directly in the possession of the ego, has the character of self, is notion.” This process of total assimilation of the object by the subject that “are developed into an organically connected whole is Logic or Speculative Philosophy.”²

Just as the process eliminates the contradiction between the subject and the object when it passes from the formation of consciousness to logic, it does the same with everything existing; it overcomes contradictions by assimilating them to the method. This is the only absolute and positive thing. “The method, therefore, is both soul and substance, and nothing is either conceived or known in its truth except in so far as it is completely subject to the method; it is the peculiar method of each individual fact because its activity is the Notion.”³

This is why for Hegel time is only proper to man because he is the only one capable of building what exists, knowledge and culture, history. The same applies to evolution. Only man evolves, not nature. This only has space left and within that space the structure of the whole.

“It is only spirit in its entirety that is in time, and the shapes assumed, which are specific embodiments of the whole of spirit as such, present themselves in a sequence one after the

1 Hegel, Georg, *Phänomenologie Des Geistes* [Phenomenology of the Mind], op. cit., Vol I, p. 32.

2 Ibid, p. 32 and 33.

3 Hegel, Georg, *Wissenschaft Der Logik* [Science of logic], op. cit., Vol II, p. 486.

other.”⁴ “But organic nature has no history.”⁵ “A thoughtful consideration must be detached from obscurities, in the end of sensible origin, especially of the theory that gives rise to plants, animals and higher animal organisations from inferior ones .”⁶

As a consequence of this, Hegel has a speculative criterion of truth, internal to the whole constructed by thought. If the construction is well made, it is true.

Hegel, a professor and not a researcher, has found a method to organise the concepts and categories already elaborated in an explanatory system. This system is that of totality and movement, within that totality, from one concept or category to another through contradictions. What he has not done is to perfect and vindicate the methods that give us those concepts, abstractions, or categories that allow us to achieve the concrete totality (empiricism and experimentation) combining them with the methods of the formal sciences, formal logic, and mathematics. And what he did neither was to give us a criterion of truth of that whole contained by the thought of objective character.

1. The anti-Hegelian interpretations of Marxism and modern epistemology

The anti-Hegelian Marxist currents — the Dellavolpianians are one of their most important expressions — focus their attack on Hegel in the supposed aprioristic character of his method, which distances him from the concrete reality that the senses give us. We have already had the opportunity to point out and respond to some of their criticisms; we will only stop at this last one on which Rossi and other members of the school insist.

Hegel proved just the opposite and this is his discovery: that the correct method is to construct the object of knowledge as a concept or idea which is constructed a posteriori and not a priori; that when it is known, it does not start from the object of knowledge but that it is constructed and, therefore, only at the end, “as a result” we have the object. Because the essence cannot be captured directly, in a single moment, but in a development, that of the reflection that constructs the object, which when finished constructing is a concrete universal and the idea. That is why everything that is not the product of a long process of construction that allows us to structure a totality, is appearance, simple moments of the essence, the presents, that the reflection and the time of the construction surpass. The object of knowledge, the concrete thought, can never be a present phenomenon but something that has a past, because it has a construction behind or is being constructed, therefore it cannot be felt or seen as the phenomenon, the appearance.

Modern epistemology, as well as the history of science, has confirmed this Hegelian conception. The object of knowledge is a result, it is built. To start studying the solar system man took a million years: that is, a million years to build it as an object of knowledge. Man did not start from it, but he came to it. The same happens with the object biology. Before us, it begins to build instead of the two objects of traditional knowledge, animal and plant kingdoms, other kingdoms (objects) of life (four or five, depending on the authors). This is how they have been built; this is how objects of knowledge continue to be built, by combinations of concepts and known abstractions.

Therefore, for modern epistemology there are two levels of knowledge: phenomena are known by formulating laws; objects are known by means of an overall construction, which is, in fact, a productive structure (how the object is produced), the so-called causal explanation. The phenomenon and the epistemic object of modern epistemology are the appearance and the essence of the Hegelian logic that takes us to the concrete or to the idea.

4 Hegel, Georg, *Phänomenologie Des Geistes* [Phenomenology of the Mind], Vol II, p. 476.

5 Ibid, Vol II, p. 220.

6 Hegel, Georg, *Enzyklopädie Philosophie* [Encyclopedia of the Philosophical Sciences], op. cit., p. 202.

We have been unable to locate this quote. We have not found it in any of the seven volumes of *Encyclopedia of the Philosophical Sciences* or any of the other works by Hegel quoted by Nahuel Moreno. We have thus placed a translation of the Spanish version quoted by Moreno. [Translator.]

2. Pro-Hegelian Marxism

The vast majority of Marxists who vindicate Hegel, whether or not they follow Engels, fall into two different and, if you will, contradictory positions. Some, like György Luckács, claim totality as the essential category of dialectical method or logic. He warns that what is characteristic of dialectics is “[...] the methodological supremacy of the totality over the individual aspects.”⁷ “This dialectical conception of totality seems to have put a great distance between itself and reality, it appears to construct reality very ‘unscientifically’. But it is the only method capable of understanding and reproducing reality. Concrete totality is, therefore, the category that governs reality.”⁸ This category of totality is common to Hegel and Marx. “We would draw the attention of readers with a greater interest in questions of methodology to the fact that in Hegel’s logic, too, the relation of the parts to the whole forms the dialectical transition from existence to reality. It must be noted in this context that the question of the relation of internal and external also treated there is likewise concerned with the problem of totality.”⁹ “This is why only the dialectical conception of totality can enable us to understand *reality as a social process*.”¹⁰

Garaudy insists on the same thing: “The main concept of the Hegelian method is that of the totality.”¹¹

Instead, other interpreters of Hegel and Marx find that the essential category of dialectic is negation or contradiction, giving the tone on the genetic or historical process of the concepts. Marcuse is one of those who best expresses this interpretation: “What he [Hegel] did discover and use was a definite form of dynamic, and the novelty of his logic and its ultimate significance rest upon this fact.”¹² “Hegel repeats over and over that dialectics has this ‘negative’ character. The negative ‘constitutes the quality of dialectical Reason’, and the first step ‘towards the true concept of Reason’ is a ‘negative step’; the negative ‘constitutes the genuine dialectical procedure’.”¹³

The two interpretations of Hegel are unilateral since his merit has been precisely the attempt to combine in a single method the concepts of totality and of the genesis through negations. His mistake will be to transform this combination into an identification of the two concepts, which leads him to totalize the genesis and thus to take it out of time, as well as to make structures or totalities ultimately closed, anti-genetic.

3. Marx as an interpreter of Hegel

Marx, in his maturity, has been who best saw the merit of Hegel and his mistake:

“The concrete is concrete because it is a synthesis of many determinations, thus a unity of the diverse. In thinking, therefore, it appears as a process of summing-up, as a result, not as the starting point, although it is the real starting point, and thus also the starting point of perception and conception. The first procedure attenuates the comprehensive visualisation to abstract determinations, the second leads from abstract determinations through thinking to the reproduction of the concrete.

“Hegel accordingly arrived at the illusion that the real was the result of thinking synthesising itself within itself, delving ever deeper into itself and moving by its inner motivation; actually, the method of advancing from the abstract to the concrete is simply the way in which thinking assimilates the concrete and reproduces it as a mental concrete. [...]”

7 Luckács, György, *History and Class Consciousness*, MIT Press, 1971, p.9.

8 Ibid, p. 10.

9 Ibid, p. 10, (end of chapter note 14, shown on p. 25).

10 Ibid, p. 13.

11 Garaudy, Roger, *Dios ha muerto* [God is dead], Editorial Platina, Buenos Aires, 1965, p. 175.

12 Marcuse, Herbert, *Reason and Revolution*, Routledge and Keegan Paul Ltd., London, 1941, p. 122.

13 Ibid, p. 123. Although Marcuse does not ignore the importance of the category of totality.

“[...] Hence to the kind of consciousness — and philosophical consciousness is precisely of this kind — which regards the comprehending mind as the real man, and only the comprehended world as such as the real world — to this consciousness, therefore, the movement of categories appears as the real act of production — which unfortunately receives an impulse from outside— whose result is the world; and this (which is however again a tautology) is true in so far as the concrete totality regarded as a conceptual totality, as a mental concretum, is, **in fact**, a product of thinking, of comprehension; yet it is by no means a product of the self-evolving concept whose thinking proceeds outside and above perception and conception but of the assimilation and transformation of perceptions and images into concepts. The totality as a conceptual totality seen by the mind is a product of the thinking mind, which assimilates the world in the only way open to it, a way which differs from the artistic-, religious- and practical-intellectual assimilation of this world.”¹⁴

For Marx, Hegel’s mistake is none other than the “illusion that the real was the result of thinking synthesising itself within itself and moving by its inner motivation”, although to “consciousness” “the movement of categories appears as the real act of production [...] whose result is the world; and this [...] is true in so far as the concrete totality regarded as a conceptual totality, as a mental concretum, is, **in fact**, a product of thinking, of comprehension”. Trotsky, without referring to Hegel, insists on the same thing, “The concrete is a combination of abstractions.”¹⁵

Hegel’s mistake is to confuse the production of the real with the reproduction on the part of the thought, although the laws he discovers on the way to achieve that reproduction are “exact”.

The anti-Hegelians criticise Engels for his defence of Hegel’s method and his rejection of the system; they think we should reject it in its entirety. Leaving aside that the quotation of Marx approves the method of the German genius, like Engels, and that logically no one can agree with the Hegelian system as absolute knowledge, closed on itself, we must point out that if any criticism falls to Engels, something we do not believe, is not having sufficiently deepened that there was a profound unity between Hegel’s method and system. For Hegel there is an intimate relationship between both, since the result of the method, as we have said, is the construction of a whole. Thus, he says: “The method effects this as *a system of totality*.”¹⁶

Since he believes the only method that exists is the one he discovered, logically he transforms into absolute his method as well as the totality that he constructs. Hence, if it is worth commenting on Engels is that he has not sufficiently vindicated the systematic or totalizing tendency of Hegel, while doing the criticism that this trend, and his method, deserves, for having transformed them into absolutes, unique, and not relative. Leaving aside the social reasons that led Hegel to be a speculator and not a revolutionary or a researcher, we say that this absolutism of his method and his tendency to make totalities is the internal explanation of his idealism and the speculative nature of his conception. The method with the system that builds is everything; reality is nothing or, at most, an epiphenomenon of the methods, the demiurge of reality.

4. Marxist logic

Marxist logic is not Hegel’s logic perfected or purged of idealistic vices. It is a new concrete logic, because it is a new combination of methods, with a new criterion of truth totally different from that of Hegel.

In this combination, Hegel’s dialectical method of producing the concrete by thought is a decisive element. Marx combines it with observation, experimentalism, the indirect observation of modern sciences, social practice, and all of them with the formal sciences of his time, Aristotelian formal logic and a primary mathematics. And as a criterion of objective truth he imposes the

14 Marx, Karl, “Outlines of the Critique of Political Economy (Rough draft of 1857-58)”, *Marx & Engels Collected Works*, Vol 28, op. cit, p. 38.

15 Trotsky, Leon, *In defense of Marxism*, op. cit., p. 118.

16 Hegel, Georg, *Wissenschaft Der Logik* [Science of logic], Vol II, p. 502.

practice, that is, part of the permanent inequality between the object and the subject, including thought, to demand knowledge to prove its truth in reality.

The history of the relations between Marx and Hegel, like the construction of the method of Marx and Engels, confirm the combination we are talking about. Marx begins the elaboration of his method vindicating those of the empirical sciences and attacking Hegel. This is the stage the anti-Hegelians like to quote. But it is precisely at the moment he has to elaborate his system, his conception of the economy and capitalist society as a whole, when he rediscovers Hegel and begins to give him great importance and to vindicate him: “What was of great use to me as regards *method* of treatment was Hegel’s *Logic* at which I had taken another look **by mere accident**, Freiligrath having found and made me a present of several volumes of Hegel, originally the property of Bakunin. If ever the time comes when such work is again possible, I should very much like to write — 2 or 3 sheets making accessible to the common reader the rational aspect of the method which Hegel not only discovered but also mystified.”¹⁷

A coincidence? No, it is the deep need for the development of his own work, which leads him to this rediscovery. Both this letter to Engels, his commentary on Hegel in the *Critique of Political Economy*, or the forewords to *Capital*, point out clearly that Marx rose from his relatively empirical stage, with an implicit Hegel, to the definitive constitution of his method with the explicit incorporation of Hegel’s method.

This explains the current discussions among Marxists; on the importance of Hegel’s method: some take Marx, as given from his youth once and for all, and oppose some quotes against others. He can only be understood by placing him in the different periods of elaboration of his method.

Although Marx-Engels make the Hegelian method a fundamental part of theirs, by combining it with the other methods and achieving a new logical structure they enrich and surpass the Hegelian method. These enrichments and overcoming, among others, are:

They generalise Hegel’s method by attributing it to reality and to nature. Not only man and the construction of knowledge occur in time and have a contradictory and formative evolution of totalities but also nature, in its own way and in a certain sense, does the same. The Hegelian construction exists, acts not only in thought but in reality. It is a colossal merit for Engels to have tried to “dialectise” nature, trying to discover the common laws that exist between nature with its different levels and man.

Overcoming the speculative, absolutist, therefore idealistic, religious character of Hegel’s method, pointing out its relative character, of one method among others, which did not surpass either this or any other method or combination of methods, the absolute contradiction between reality and man, between the object and the subject, but it enriched that contradiction, making it more dynamic and always open, with relative solutions, which were given by praxis and not just by scientific knowledge, which is only one aspect of that praxis.

Marx distinguishes between totality and genesis, liquidating the Hegelian identification of both categories. He thus achieves open totalities, which come from others and go towards others in a perpetual movement that makes the totality a relative reality, not an absolute one.

This allows him to clearly formulate two logical necessities, which in turn are laws of all realities, the “laws of internal connections” or of the “organic totality” and the “passage from one system to another”. Thanks to this, Marx begins to order the laws discovered by Hegel, although without formulating it explicitly, as belonging to one or another logical necessity. The leap of quantity into quality, the negation of the negation, etc., they are laws of the historical process. The reciprocal action, the unity of the opposites, the whole determined of the parts, etc. are laws of “internal connections”.

¹⁷ Marx, Karl, “Letter from Marx to Engels, 16 January 1858”, *Marx & Engels Collected Works*, Vol 40, Lawrence & Wishart, London, p. 249.

Marx-Engels give a fundamental importance to observation and experimentation, as gatherers of materials for the construction of scientific systems and as proof of them. They vindicate mathematics and the formal logic of their time as a fundamental tool for scientific knowledge.

As a consequence of all the above, they impose as a criterion of objective truth the practice and not only the coherent construction of knowledge.

It is impossible to say whether Marx came to glimpse that there were two types of truth, objective and formal, with two types of relationships, causal and of implication. In thesis two on Feuerbach, Marx speaks of objective truth. This is very profound because precisely the only truths whose criterion of truth is practice are those of the objective sciences, not so the formal sciences, whose criterion of truth is the coherence of the structure.

Since this introduction is dedicated to Marxist logic, we do not think it necessary to repeat what has been said about other aspects of the Marxist method.

5. Marxist logic and formal sciences

If with Marx emerges a new logic of the concrete, open, contradictory, unifying different methods, a similar phenomenon occurred in the field of formal sciences. A new formal science was beginning to emerge encompassing, as Marx does with concrete logics, all the concrete, formal sciences or, rather, tending to achieve that combination.

From the middle of the last century, it was attempted, from mathematics and formal logic, to find a strictly coherent formulation of the methods of logic and mathematics. This led to a fundamental overcoming of the Aristotelian logic, the concept, judgment, and reason to begin to develop a logic of relations and order, as summarised well by Bertrand Russell, one of the creators of this new branch of logical science: “Those who do not succumb to the subject-predicate logic are apt to get only one step further, and admit relations of two terms, such as before-and-after, greater-and-less, right-and-left. Language lends itself to this extension of the subject-predicate logic, since we say ‘A precedes B’, ‘A exceeds B’, and so on.”¹⁸

This new branch of logic revealed itself very deep and this is how Piaget has achieved a combination¹⁹ of formal Aristotelian logic and the modern logic of relationships, in a much broader logic of formal type, which generalises and leaves open the doors to the possibility of continuing to achieve the formalisation of the internalised activities of the subject in increasingly rich combinations. Our author argues that between the logic of the (Aristotelian) classes and that of the relations there is a profound difference due to the different type of reversibility used, by inversion the first, by reversion the second. The first logic, the logic of the classes, formalises and generalises the actions of the subject of gathering and separating the objects and their properties, their qualities. If I join the class man with the class of non-human mammals, I achieve a higher order class, which is the mammal class. If now I invert the process and from the mammal class I remove the non-human mammals, I am again with the man class. That is to say, the previous operation of reuniting was cancelled. This reversibility that Piaget calls inversion or negation, typical of the logic of classes, is different from the reversibility of the logic of relations, as a consequence of the actions formalised by this logic, ordering and no longer gathering and separating. For example, if we have a table A that is smaller than a table B, the reversible process is that table B is bigger than table A, which cancels neither, nor the relationship, since the only thing that has been done is to achieve a reciprocity of their differences, or their relationship but this remains. Piaget argues that combining these two types of reversibility a much richer formal logic is achieved, which is the logic of adolescents and hypothetical-deductive.

Mathematics has had a process similar to that of formal logic since the last century, which has allowed this century to achieve the formulation of three large mathematical structures, which

¹⁸ Rusell, Bertrand, *The Philosophy of Logical Atomism*, Routledge Classics, London, 2010, p. 136.

¹⁹ Piaget, Jean, *Traité de logique. Essai de logistique opératoire* [Treatise on Logic], Armand Colin, Paris, 1949.

encompass and express all mathematics, those of Nicolas Bourbaki theory of sets, algebraic manipulations, and the topological ones which surprisingly coincide with Piaget's psychological analyses of the existence of three irreducible structures among themselves, one whose reversibility is inversion or cancellation and which can be described "by referring to algebraic or group models; structures whose form of reversibility is reciprocity, and which must be described in terms of relations and order; and structures basic to the continuum especially spatial structures whose elementary forms, surprisingly enough, are of a topological character, and appear before metric and projective constructions!"²⁰

All these mathematical and logical structures tend to combine with each other to give us increasingly useful ways to capture the different segments of reality. It is thus how Boolean algebra, the laws of thermodynamics, the calculus of possibilities, as the different formal logics, are used today to formalise the most disparate sciences, ethnology, sociology, communication, etc., and even technology (cybernetics, etc.).

These new formal sciences, which become coherent and unified in a great logical-mathematical system and which have been developed (until a few decades ago) in a relatively independent manner from the methods of the objective sciences — which explains the Platonising tendency of some of its supporters and discoverers, like the Russell of the first epoch — must be consciously combined with the only explicitly concrete scientific logic existing, the Marxist logic.

Just as at the beginning of logic and mathematics these were combined with observation to give the concrete Aristotelian logic of classification of objects and beings, nowadays it is the new formal logic-mathematical science that must be combined with Marxist logic (in turn a combination of the dialectic of production of the concrete-thought, with the direct and indirect observation of empiricism, experimentation, and the criterion of objective truth by practice) to give us a much richer logic. This is how our outline of the history of logic ends, with the aim of abandoning once and for all the false and ahistorical combination of formal Aristotelian logic with Marxist dialectical logic, with an open logic based on the methodological application, for the moment and until it is overtaken, of the law of uneven and combined development of different methods of research and exposure discovered by man to know the reality and his own actions.

6. A good example of current Marxist logic

In the *Traité de Sociologie du Travail* in which Pierre Naville writes the second chapter on the method in Sociology of Work, a series of methodological considerations are made that agree with many of the considerations we have made in the preceding. He argues that although this methodology has not yet been perfectly elaborated, it is a combination of measures, order and concepts, different forms of observation, surveys, interpretation and explanation, and, finally, of prediction and experimentation.

Regarding the measure, order, and concept, he says "this intrinsic requirement in the sector of work is naturally supported by the methodological requirements of the sciences, always supported by the measures."²¹

"Indeed, everything is measured, both in terms of work and in the other domains because everything is classified and ordered. The measure may initially be a metric one but it is primarily an ordering. That which serves as a rule in the work is always a measure but an ordered measure; in other words, a structure of order. The measure does not, therefore, lead to the given, from which it comes and which it encompasses. What it aspires to is a logic.

"In short, the sociology of work is developed in the logic of order for two general reasons. The first is that work is the essential ordering element of societies. The second is that the essential

²⁰ Piaget, Jean and Beth, Evert Willem, *Mathematical Epistemology and Psychology. Essay on the Relationships between Formal Logic and Real Thought*, op. cit., p. 168.

²¹ Friedmann, Georges and Naville, Pierre, *Traité de Sociologie du Travail* [Treatise on Sociology of Work], Librairie Armand Colin, Paris.

criteria of the scientific method, whatever its point of application, lies precisely in the order of the measures. The particular techniques and procedures of investigation, survey, or explanation must be subordinated to these two demands that simultaneously make their own the object and its form of knowledge.”²²

“The measure will be in its general sense the establishment of a formal or abstract system of elements that have certain operative possibilities. These properties can only be defined once certain values have been assigned to the elements and to the operations according to certain rules. Such a system of measurement can be elaborated from the properties and observable relations on objects and events of the real world. But to be rigorous, it must almost always become formal and abstract. It will also be possible to manipulate it under its abstract form to extract new properties that were not directly observable.”²³

Regarding the forms of observation, Naville understands that “observing is the first step that allows us to quickly classify, combine, explain and even experiment. The observation has very different characteristics.”²⁴ He divides the observation into direct and indirect. The indirect is the one that is carried out on documents.

“All techniques and methods ordinarily find a place in what is called a survey.”²⁵

Regarding interpretation and explanation, he states that “hypotheses and an arsenal of previous concepts are necessary; its usefulness is to highlight one or several functions or even more simply, an operation. As with everything related to work, it has an essentially operative character, which is why the explanation should strive to take the form of an operative model.”²⁶ Now, “we must, therefore, look for the conditions of expression that leave the least possible position to the uncertainties of ordinary language, which leads us to use a particular symbolism that takes an abstract character.” “Therefore, these beings and these groups embark on a web of relationships that is less and less possible to explain and often to describe without resorting to a special symbolic language.”²⁷ “In such a way that the causality derived from grammatical relations can be replaced by calculating operations, based on certain forms of measures. This is what the search for models can do for us.”²⁸

And finally, regarding prediction and experimentation: “in work matters as in the others, all experimentation depends on a certain degree of predictability and control of the phenomena.”²⁹

If we bear in mind that all these methods must be combined with the history of work, its connection with the economy and with sociology as a whole, we find that Naville in his methodological description brings together the methods that characterise contemporary Marxism, although unfortunately without pointing out that this combination of unequally developed methods obey a methodological need and an objective reason, they are synthesised in the theory of uneven and combined development. That forgetfulness also explains why he puts greater importance, apparently, on the structural analysis than on the historical one, although he does not ignore its close connection.

7. Towards a logic of revolutionary politics

If the systematization of Marxist logic is far from having been carried out, we face a similar situation in the field which apparently is the strongest of Marxism, logic or political methodology.

22 Ibid, p. 47.

23 Ibid, p. 49.

24 Ibid, p. 32.

25 Ibid, p. 55.

26 Ibid, p. 59.

27 Ibid, p. 60.

28 Ibid, p. 61.

29 Ibid, p. 62.

Marxist logic, the only concrete scientific logic existing, efficient and with pretensions of such, has achieved an important progress, although most of the time unconscious, practical, in the hands of scientists who rediscover and enrich every day that logic and that epistemology, that without knowing it (the Piaget case is the most notorious, since he knows of the link between Marxism and his method). Something similar has happened with Marxist political logic. Through its great masters, mainly Lenin, Rosa Luxemburg and Trotsky, it has achieved a spectacular development but without reaching a systematization.

We believe this parcelled, unconscious, and unsystematic development of Marxist logic, in the sciences and in politics (within each one of them in turn in different sectors), obeys, among others, a main cause: the regression of the world revolution starting in 1923 provoked by the Stalinist counter-revolution that dogmatized and canonized official Marxism and forced revolutionary Marxism to defend the political and methodological heritage of Marxism. This made the development of Marxism to become uneven, contradictory, and non-homogeneous.

The current discussions among Marxists show that the situation has been reversed and that the current rise of the world revolution has led, at the same time, to a theoretical renaissance of Marxism, which has been set in motion towards the achievement of new conquests, new constructions, both scientific and political. In this path, sciences and Marxism begin to combine again, fertilising each other. We gave two examples, one of Piaget, a pure scientist who reaches explicitly Marxist conclusions; another one is Naville, a great Marxist thinker who becomes a scientist of note. Both point to the path that has just begun. Both tend to and achieve teamwork, as a foretaste of the future interdisciplinary scientific work of the socialist society. The result of all this is in sight, the Marxist logic of knowledge of reality will begin to systematize. A similar phenomenon will occur in the political field. A consequence of this will be that the essential segment of the current Marxist logic, its political logic, will be perfected and systematized.

Novack's book will be recorded as a landmark in the history of that systematization of a revolutionary logic, to which the knowledge of reality will be subordinated. Because the main contradiction — that the revolutionary logic tends to mediate, to overcome — is to know exhaustively the reality but to revolutionise it. It is the logic of the contradiction carried to its maximum expression: to know in order to change radically. But not even revolutionising, transforming reality, revolutionary Marxist logic ceases to be knowledge of that reality, since it revolutionises developing possibilities, hypotheses, trends that exist in the same reality. That is, Marxist logic develops contradictions that exist in the same reality. This is riddled with uneven and combined developments of contradictory units: between the objective situation, of the working class and the working people with their conscience; between the capacity for struggle and organisation, on the one hand, recognised leaders who do not want to fight or organise on the other. These and other contradictions are summarised in a fundamental one: objective conditions more than mature for socialism, lack of a revolutionary leadership of the mass movement.

These contradictory units, these combinations, are dynamic, break their equilibrium and tend to achieve new balanced structures, in which the mass movement tends to elevate its consciousness to the level of the objective situation. This chequered, contradictory march, forming unexpected combinations, takes place through momentary objectives of the mass movement that, responding to its most pressing objective needs, serves to set it in motion and, together with it, overcome its level of organisation and consciousness. The momentary objectives are linked historically to each other and at the present time to the only certain possibility, to that of socialism and to the taking of power by the working class. The theory of this march for the objectives of the masses, combined, without respite, to propel them towards the socialist revolution, is the theory of permanent revolution. But, who can act scientifically to achieve an understanding of reality in the sense described above and, at the same time, use that knowledge of reality to act revolutionarily? That who is the revolutionary Marxist party, there is not, there has not been possible to discover another. Just as the conscious or unconscious executors of the Marxist logic of objective knowledge, they are scientists; there is no, there can be no other executor of the revolutionary Marxist policy other than the revolutionary Marxist party. That was the great discovery of Lenin, who not only discovered the only tool that

could lead the revolution to socialism but, in passing, the only possible subject of revolutionary Marxist logic.

All this makes it necessary, against the fashion of the “new” (which is nothing more than the negation of logic, of the need for the program and the Marxist party, in the name of something much older: humanist socialism, individual elitist terrorism, typical of the anarchists and populists, the propaganda for the facts, the empiricism as contempt of the theory and the program, the adoration of the facts and momentary successes) that we vindicate more than ever the Marxist logic of knowledge, synthesised in the theory of uneven and combined development, inseparably bound to the only existing Marxist political logic, the theory of permanent revolution and the only one capable of applying it, the revolutionary Marxist party. §