

Hegel's Theory of Science

Andy Blunden, January 2025

Marxists have long recognised that Marx made use of Hegel's *Science of Logic* in his political economic studies and the writing of *Capital*. However, none have been able to explain *how* Marx used the *Logic* in *Capital*, as I demonstrated in my 2025 Volume, *The Capital / Logic Debate*.

The chief error of all these attempts generally was in presuming that Marx used the *Logic* as a metaphor or a model for political economy. As a result they looked for a homology or "likeness" between parts of *Capital* and parts of the *Logic*. But logic is a science which is distinguished from other sciences by having no positive content. That is why Hegel began the *Logic* from an empty concept, Being, ensuring that no content is smuggled into the logic either by way of axioms or unacknowledged content implicit in the starting point.

Political Economy, however, like all the natural and human sciences, *has* a positive content. Both Hegel and Marx were well aware of this obvious fact. As Marx saw it, the content of Political Economy is value, that is, abstract human labour. Human labour, whether abstract or concrete, is not nothing. The whole of *Capital* depends on how Marx formed a concept of abstract human labour.

If similarities in form between Hegel's *Logic* and any positive science can be found this is because the sciences are made up of true concepts and all true concepts contain implicit contradictions characteristic of their subject matter. The way these contradictions originate and how they play out is bound to exhibit a variety of recognisable forms. Although every immanent exposition of a science, that is to say, an exposition which follows the logic of its content, is unique, similarities will always be found here and there. This is much like how each of the classic works of European music is unique and yet all share a multitude of forms which are the subject matter of musicology. But recognising similarities is a far cry from understanding the logic which is unique to one phenomenon.

Christopher Arthur is surely right when he said:

So we have in the dialectic of capital one that is less general than Hegel's in its *scope*, but within its own terms equally *absolute* in so far as it is founded on all-round abstraction to leave quasilogical forms. Hegel's philosophy is encyclopaedic, and it has hundreds of categories accordingly. Capital, compared with the universe as a whole, is characterised by a poverty-stricken ontology.

Arthur 2011

Hegel elaborated in the *Science of Logic* a range of more than 400 concepts and transitions from one concept to another from which the sciences he outlined in the *Encyclopaedia* could draw from.

It is in the chapter of the *Logic*, entitled "The Idea of Cognition" that Hegel set out his theory for the development of the natural and human sciences. This chapter is the last before the Absolute Idea which is merely a summary of the foregoing content. Any doubts about this claim can be laid to rest by examining the various sciences treated in outline in the *Encyclopaedia of the Philosophical*

Sciences, which reflects the approach outlined in this passage both as a whole and in each individual science.

The only participant in the *Capital / Logic* debate who noticed the existence of this chapter is Christopher Arthur, who wrote:

What is striking is that this is thematised by Hegel in the part *preceding* the Absolute Idea, namely *cognition*. Here there is a discussion of how, in theory and in practice, the Idea both discovers, and creates, itself in what seems other than it. Yet by thematising this *before* the logical Absolute, Hegel makes it appear that success is guaranteed in advance.

So I think that cognition should come at the end of the Logic, encapsulating the ambition of the concept to make itself Idea through uniting thought and reality, but with the job itself still to be done in the following parts of the *Encyclopaedia*. Cognition is surely the *hinge* of the logical and the real.

Arthur, 2011

What Arthur overlooked in reading this passage is that the actor is not the Idea as such, but the “Subjective Notion,” that is, a finite mind, which could be an individual person or a social movement, whose scientific activity is to be taken insofar as it is necessary, not psychologically. This finite mind has an urge (*Trieb*) or will to realise itself in the objective world, whose existence Hegel claims to prove in the Subjective Spirit. This *drive* to realise itself is the only element of the Philosophy of Spirit which is introduced into the *Logic*; there can be no sequence of concepts unless and until there is a subject which drives a concept beyond its limits in seeking to realise itself.

In §474 of the Subjective Spirit, Hegel concludes:

What are the good and rational propensities, and how they are to be coordinated with each other? resolves itself into an exposition of the laws and forms of common life produced by the mind when developing itself as *objective mind* – a development in which the content of autonomous action loses its contingency and optionality. The discussion of the true intrinsic worth of the impulses, inclinations, and passions is thus essentially the theory of legal, moral, and social duties.

Hegel, 1831, §474

Consequently, human beings are driven to form a conceptual grasp of the Idea in the context of activity in a material world where it must have to do with “externality” as well as Logic. One path of this realisation of the will is outlined in the *Philosophy of Right*, an outline of Hegel’s theory of modern society.

This is a problem which confronts all individual human beings, and it is one which can only be solved through the formation of a material culture by means of which human beings can control their own will and some form of state which regulates the activity of themselves and other humans.

The outcome of the Idea of Cognition is the “Syllogism of Action,” in which the subject uses one part of the objective world to act upon another to achieve its end. Thus the ambition of the Idea of Cognition is far more modest than the

Absolute Idea, being simply to understand human practice insofar as it is rational.

The passage entitled The Idea of Cognition sets out the means by which the *Encyclopaedia* and the various sciences outlined in the *Encyclopaedia* are to be constructed. A reading of the *Encyclopaedia* will confirm what Hegel says especially in the part of the Idea of Cognition called The Idea of the True.

Technology and the natural sciences were at such a primitive stage of development in Hegel's times that the application of Hegel's approach to the natural sciences raises problems which are irrelevant to the issues were are raised by Marx's *Capital* and will not be considered here.

In Hegel's day there was no scientific theory for the development of the biosphere. Given that Hegel rejected the theory of Lamarck as implausible, the only available theory of the development of the world was that given in the Book of Genesis. Consequently, researchers of the time sought an anthropocentric rationality in the natural world. The evolution of the continents did become known in Hegel's life time, but that was the only clue Hegel had to the evolution of the Earth and the Universe as a whole. Further, microscopes were not yet powerful enough to reveal the microscopic world of life-forms which made explicable the life of the plants and animals encountered in human experience. In any case, Hegel did no original research in any of the natural sciences, he merely outlined their current forms in the *Philosophy of Nature*. His knowledge of the nervous system was also limited in the extreme and Psychology did not exist as a science in his time. Even in the social sciences, his knowledge of non-European societies was reliant on the reports of European missionaries and explorers and consequently was scant and Eurocentric.

Consequently, the only sciences which were genuinely open to Hegel were Logic and the Social Sciences, and in both these domains Hegel did epoch-making and original research. Hegel's *Philosophy of Right* is the only work of Hegel's on a positive science which stands up to criticism in our times, and provided Hegel with a field of research where all the essential facts were known to him. So this work provides the most fruitful exemplar of the theory of science outlines in the Idea of Cognition in the *Science of Logic*, and was the first work to which Marx turned when Marx "eagerly grasped the opportunity to withdraw from the public stage to my study" (1859).

I have provided an [Appendix](#) with excerpts from the Idea of "The Idea of the True" with my annotations. Below I will explain the passage in my own words.

The Idea of the True

In determining an action, a subject needs to know what is true of the object and which possible action promotes the Good. Accordingly, the chapter is structured as a "syllogism," the two premises of which are The Idea of the True and the Idea of the Good. The action chosen by the subject will be in accord with both true and good.

The Idea of the True is itself a syllogism of which the first premise is Analytical Cognition and the second premise is Synthetic Cognition. That is, a science must represent a true concrete concept of the Object by an analysis of the object into parts and a synthesis of those parts according to a concept of the phenomenon.

The subject matter presents itself as a range of distinct phenomena which will each be known by some abstract general conception, such as “Right” or “Art” or “Political Economy,” but is not yet grasped with a true concept. The conception which marks out each given phenomenon is characterised as “abstract general” because in the absence of a true, concrete concept, its conception will be based on a variety of things like its place in human practice such as its usefulness, some common feature or quality of things given in perception or opinion, or its connection with other phenomena, or alternatively some problem or lack in respect to such features.

Analysis requires that any existing theory of the subject matter must be laid aside with the aim of forming a true concept of the phenomenon. The subject matter must be apprehended without any mediation, but taken up just as it immediately appears to “ordinary consciousness.”

Ordinary consciousness has at its disposal universal and particular conceptions and concrete individual moments which are given immediately in perception one of which is distinctive in some way and needs explaining. This is the starting point of a science.

Initially, the subject must make itself passive before the subject matter so that the subject matter is able to *show itself* without the imposition of any preconceptions on the part of the subject. Analysis continues as far as is possible to find the smallest elements which can be taken as part of the subject matter, arranging them according to differences and commonalities found in the subject matter, in the absence of any overall plan or concept of the material.

It doesn't matter how the material is organised, just so long as its concreteness is retained, because the organisation of material can always be returned to later. Analysis is complete when the smallest element is isolated which counts as part of the subject matter as conceived in the abstract general understanding of the phenomenon and the complete diversity of these elements is elaborated. Analysis does not go beyond the point where the whole which makes the elementary part of the phenomenon is surpassed. For example, analysis of social phenomena would not go beyond the individual human being to parts of the body, because all social phenomena are taken as essentially relations between whole human beings and their activity.

In Hegel's words:

Analytic cognition ... starts from a *presupposed*, and therefore individual, *concrete* subject matter; this may be an object already *complete in itself* for ordinary thought, or it may be a *problem*, that is to say, given only in its circumstances and conditions, but not yet disengaged from them and presented on its own account in simple self-subsistence. ... (§1709)

“Complete in itself” means that the object is not seen as a part or result of some larger phenomenon but is immediately given to everyday consciousness. The criteria by which the material can be arranged is arbitrary but must be immanent to the subject matter itself. Criteria from outside the individual datum must not be introduced because this would prematurely entail some form of mediation. Only what is immediate is retained.

Analysis continues until the full range of data belonging to the phenomenon is identified and arranged according to its immanent differences. The principle of analysis, its outcome and guiding principle, is the One. The One is a “relationless atom.” Analysis is nothing other than an apprehension of what is.

Generally speaking the concepts elaborated in the Logic of Being in the *Science of Logic* are applicable to analysis. This is not to say that analysis will *replicate* or copy the Logic of Being, but simply that analysis draws on these concepts, but the conceptions are now not merely formal, as they are in the Logic of Being, but have content. That content comes from the concrete individual products of analysis. Analysis establishes what is.

When analysis is complete, cognition passes over to synthesis in which products of analysis are brought into relation with one another.

Synthetic cognition aims at the *comprehension* of what is, that is, at grasping the multiplicity of determinations in their unity, ultimately as determinations of the same concept. It is therefore the second premise of the syllogism in which the *diverse* as such is related. Hence its aim is in general *necessity* ... Now synthetic cognition passes over, in the first instance, *from abstract identity to relation*. (§1720)

During this phase of cognition the concepts elaborated in the Essence Logic will be utilised, but again, it must be emphasised not by means of some kind of replica of this section of the *Logic*, but the concepts which will be used will resemble those found in this section of the *Logic* which begins with a critique of Identity. But this development is still not guided by a concrete concept of the subject matter, even though it is understood that the determinations given are those of the Notion. The development of this phase may take the form of an immanent critique of existing theories which have hitherto been held in abeyance. The outcome of this phase is to be a true concept of the phenomenon, marking the beginning of a new division of science.

The key paragraph comes under the heading of “Division.” In this context, Political Economy figures as one division, but this also applies to divisions *within* Political Economy.

The problem is how to choose which product of analysis which is to be the starting point for the synthesis of a new “circle,” that is to say, a new science which will take the form of a concrete concept of the given product of analysis.

Recall that all such products of analysis will as given above in §1709: “a *presupposed*, and therefore individual, *concrete* subject matter ... an object already *complete in itself* for ordinary thought.”

The progress, proper to the Notion, from universal to particular, is the basis and the possibility of a *synthetic science*, of a *system* and of *systematic cognition*. (§1733)

But when starting from the universal, Hegel is still referring to a concrete product of analysis. Consequently, the subject must select from among the products of analysis a “universal individual” as follows:

The first requisite for this is, as we have shown, that the beginning be made with the subject matter in the form of a *universal*. In the sphere of actuality, whether of nature or spirit, it is the concrete

individuality that is given to subjective, natural cognition as the *prius* (*das Erste*, i.e., first); but in cognition that is a *comprehension* (*Begreifen*), at least to the extent that it has the form of the Notion (*Begriff*) for basis, the *prius* must be on the contrary something *simple* (*Einfach*), something *abstracted* (*Ausgeschiedene*) from the concrete, because in this form alone has the subject-matter the form of the self-related universal or of an immediate based on the Notion. (§1734)

Note in the above that this requirement is limited to “the sphere of actuality, whether of nature or spirit.” In other words, anything but Logic. However, the equivalent concept in the *Logic* is the One – a contentless unit.

The universal individual is selected from amongst other individual data on the basis that it expresses in its own nature what is universal in the phenomenon. This depends on how the subject conceives of the phenomenon, but this is not a matter of personal opinion but reflects existing science or social movements. Marx’s choice of the commodity was in this sense equally a product of an immanent critique of political economy as an analysis of the subject matter itself, in particular his study of economic history.

Since the universal individual must be a “concrete individuality” alongside other such individuals, “value” does not qualify. Value is already a product of analysis which draws together diverse parts of the subject matter of political economy, what are claimed to be “forms of value,” and is not given to immediate perception. The choice of the universal individual is limited to individual concrete objects of “subjective, natural cognition.”

This datum is called the first or original, in German *das Erste*, but translated by Miller as the “*prius*,” a word which is not commonly known, so I prefer to retain the term “first” for this unit.

Hegel says that the first must be “something *simple*, something *abstracted* (*Ausgeschiedene*) from the concrete.” Analysis has already produced the simplest possible data which qualify as components of the given phenomenon, in this case, the simplest elements of political economic activity. Hegel says that the unit must be abstracted from the concrete, so the historically most primitive, simplest type of the entity must be chosen and abstracted from the concrete and taken up in its own essential nature. That is, what is identical in any stage of development of the economic environment, even though it is universal for only one economic system. For this reason, Marx set aside commodities in the form of a service or an ideal (such as intellectual property), taking as its archetype the simple material product of human labour characteristic of industrial capitalism, but known before Political Economy, from the earliest times of human society, albeit as a marginal and extraneous part of ancient life.

It is self-related in that it does not depend on any other product of analysis for its being, it stands on its own, so to speak.

It was on this basis that Marx selected the commodity. This universal individual can be termed the *unit* (*Einzelheit*) as well as the *germ cell* (*der Keim*), both terms which Hegel uses in the *Logic*. Unit, because it is the simplest and final complete product of analysis of the subject matter of political economy; germ cell because analysis of the commodity will be the conceptual basis guiding the

resynthesis of political economy as a consistent, concrete science, and is the embryonic form of a series of forms of value which grow out of it.

the form of abstract universality is characteristic of its *first*. Therefore any subject matter whatever that seems to possess an elementary universality is made the subject matter of a specific science, and is an absolute beginning to the extent that *ordinary thought is presupposed* to be acquainted with it and it is taken on its own account as requiring no derivation. (§1738)

What remains then is the analysis of the final product of analysis of political economy. Analysis of this datum, the commodity, is a unique scientific task, producing a new *universal* concept.

As to the synthesis of the products of analysis, Hegel says that there are no given criteria for how *particulars* are to be defined.

Only an immanent principle would be required, that is, a beginning from the universal and the Notion ... and therefore takes the determinateness of the content from what is given.... For the particular that makes its appearance in division, there is no ground of its own available, either in regard to what is to constitute the basis of the division. (§1739)

there exists a crowd of principles to which it has to conform, and therefore in one series of its forms follows one principle, and in other series other principles, as well as producing hybrids.(§1740)

Each division of the subject matter, moving from the universal individual or unit, to each *particular* unit, must be made in the same way as described. This means that not only must the commodity be analysed and provide the basis for further development, but at each stage in the synthesis a new first (or unit or germ cell) must be chosen which will function as a unit and germ cell for further development.

In composing the *Encyclopaedia*, Hegel identified the unit of each science with the guidance of the preceding science, as illustrated above in the case of the *Philosophy of Right* whose germ cell is a fundamental unit of Objective Spirit, a piece of private property (according to Hegel).

The *Encyclopaedia* is not available to the modern writer who cannot count, as Hegel did, on the absolute validity of an underlying science. In lieu of this the present day scientist must have recourse to the historical development of the object itself and in its reflection in the science of the time. "The real subject retains its autonomous existence outside the head just as before" (Marx, 1857, p. 101).

According to Hegel, analysis of the germ cell provides a concrete universal concept of the subject matter, and further progress towards the determination of particulars is to be guided by the products of the analysis of the germ cell. I must turn now to Marx's use of history.