

# An Introduction to the Science of Logic | Elfège Leylavergne

Finite concept and *infinite* Concept

## Abstract

What is Truth ? The classical definition of truth faces a huge problem : if truth is to be found in the agreement between judgment and reality, then truth is *immediately* non-truth. Since what we judge is supposed to be of a different nature than that of the judgement itself, this same judgement then becomes the object of another judgement. Therefore, if we want to define truth, it is not quite necessary to *define* it but rather to expose its own effectuation. This is precisely what Hegel's philosophy proposes to do. However, since we are so used to thinking in a classical way--in the way that Aristotle and almost all philosophers and intellectuals until now have thought--we find ourselves barely capable of reading Hegel's exposition of truth as the objective infinite. Even using words such as "objective infinite" could make no sense at all to our common understanding. Therefore, my goal is essentially to operate a simplified, and even simplistic, double and oscillating reading of Hegel that might help any non-Hegelian philosopher or even scientist to at least understand what is at stake in the *Science of Logic*. Hegel's logics, among other things, allow us to understand how the sciences of nature remain a finite and momentary process of the Mind.

In *Science of Logic* and in the additions thereon (Hegel, G.F., *Science of Logic* (1827-1830), Vrin, trans. Bourgeois, Paris, 1970, pp. 290-292 sq. §24 and Add. p. 474 sq.) the author of *The Encyclopaedia of Philosophical Sciences* raises the following question: what is truth? The answer to this question appears clearly in the second addition: truth is "the adequation of content with itself." (ibidem p.479) Hegel offers to distinguish this definition from the classical definition of truth, namely "the adequation of an object and its representation." This definition has for effect the inconvenience of presenting a duality between the representation and reality, while the definition of truth that the author judges "deeper" seems to eliminate any dualism.

What I offer here is to produce a primo-explanation of this definition of truth--simple, same and that borders on simplism--since this definition is all about the comprehension of one of the major blocks of Hegelian dialectic in which truth must be understood as the *infinite and concrete unity* of content with itself. If, in fact, it is certain that the classical definition is intuitively more evident for human understanding, it is otherwise just as true that it leaves us facing a major problem: the issue of dualism, that has had the major inconvenience of rendering any metaphysical speculation sterile. Therefore, what will be attempted here will be to introduce the reader to the notion of infinite unity of truth by showing how the classical definition has no formal value. Indeed, if truth is "the adequation of an object with its representation," then truth becomes impossible by this very definition. This is fairly easy to understand if we analyze the proposition itself: it simultaneously presupposes that the object is distinct from the representation--therefore putting the object at a distance from the subject, making it exterior to said subject--and requires that there must be an adequation between both. Thus, in classical philosophy, this very gesture creates a problem it then feels constrained to solve.

Hegel, however, does not seek to show that this dichotomy is without any meaning; he does not refute the classical definition of truth. He rather points out that

this dichotomy is only valid at a certain level--or for certain modes of our consciousness--that seeks truth as *exactitude*. However, no one denies the fact that exactitude became possible due to the separation of one changing reality from another (intelligible and formal), and that this was a necessary outcome whose historical realization took place after the Copernican revolution. \_ Nevertheless, Hegel adds that this dichotomy is indeed bad in itself and even non-true albeit that it permits the production of exact statements that are fully adequate to what exists. How can Hegel then say that exactitude comes from the *non-true* when we know how much our understanding attaches itself to discovering universal laws that justify their universality through their precision: essentially through their degree of exactitude and predictability?

Nevertheless, the point is not to state that the sciences of nature are *false*; the non-true is not falsehood. This is so in order for Hegel to show how the sciences of nature give themselves a finite object, while the logic to which they are henceforth forced to refer themselves to is speculative by nature. If the skeptical empiricism that governs the new scientific paradigm remains prisoner of the externalization of the object that this ancient dichotomy has admitted as evidence, it is nevertheless true that formalism, as the example of contemporary physics proves, is not able to part with its desire for theoretical unity. In other words, despite a dichotomous postulate, without knowing it and without thinking about it for one instant, modern theoretical practice is part of a strictly metaphysical quest. What makes such a paradox logically necessary is what I offer to expose here.

To begin, we can proceed by looking at several reminders of elementary logic. A distinction between finite concept and infinite concept will show what formal usage formal sciences make of the infinite, as well as the limits of this formal usage.

Finite concepts all have one thing in common: they designate something other than themselves. This is what the famous pliancy in logic--that says that the concept of the knife does not cut--illustrates. This type of concept is limited, as it bases itself upon our finite and immediate apprehension of things, which is to say: purely intuitive and tangible. The finite concept is such because, in sum, it is always foreign to the object of which it is the concept. This returns directly to the now-famous distinction that Hegel makes between *das Objekt* and *der Gegenstand*. *Der Gegenstand* translates itself thus: object. It is the thing that is here, in front of me and apart from me, totally independent of me, that has an existence exterior to my thoughts. To the opposite of the object, *das Objekt* refers to the object, for example; a discussion, or the artistic Object. Here, the thing is dependent of the mind, its existence only has reality in, through, and for the mind.

Thus contrary to the finite concept which represents exterior objects to itself, the veritable concept makes ONE with its content. Take the concept of State, for example. The State is not a general concept that we preconceived before building--as is the case with the knife. The State is already a concept itself, and at the same time it is an effective reality in the life of each of its members.

The finite concept has the object as object, while the Concept (i.e. the infinite concept) simply has itself as object. But what conscience always immediately grasps is the finite concept. This then means that conscience first apprehends reality as exterior to itself, and this is what Hegel calls the "First Position of Thought with Respect to Objectivity."

However, the finite concept could not exist if thought itself did not give it such an existence. And since thought is what it is--that is to say this being capable of *producing*

infinite being--this means that it has its truth in the infinite. Here, we could simply object that conscience therefore elevates itself towards the infinite, based upon finite concepts. But this would be the same as saying that the infinite is like the result of the finite, when it can only be understood once it encompasses the finite in itself. Therefore, the finite must be a *result*, and even a *resolution* of the infinite; and moreover, the thinking must always be infinite in itself--even when it postulates that the thing exists externally and independently of all content of thought. In other words, only one who thinks can set the thing as being *its* other.

This is why we must acknowledge the finite concept as a proto-elaboration of the thinking in its other and thus understand how the mind resolves--on its own--to step out of itself in this first position with respect to objectivity.

“The first position is the naive process that holds--still without conscience of the opposition of thought by and against itself--the thought that, by its reflexion, truth is known, and that objects are veritably brought before conscience. Caught in this belief, thought goes directly to objects, reproduces the content of sensations and intuitions based on itself, by making of this content a content of thought, and thought finds its satisfaction in such a content--as it does in truth. At their roots, all philosophy, all sciences, and even the everyday actions of conscience live in this belief.” (Ibidem, §26, p 293).

By the contradiction that it contains, this first position already seems totally caught in the infinite. It is a bit as if we were looking at a moment in which thought was already facing *truth*--but in an entirely confused manner. Indeed, on the one hand, thought *believes* that “*objects are veritably brought before conscience.*” But on the other hand, thought cannot avoid replicating them for itself. More clearly and more simply, here is how we can expound Hegel’s statement in order to make it accessible, alternatively, to our only understanding, and then elevate it to a level that is more authentically dialectical. To this end, I offer to give you a sample of what I call a classical and dialectical presentation. The point is to, on one side, present the dialectical logic *converted* to the format of classical logic (and thus made more approachable), and on the other side, in *italics*, to present the dialectical point of view of the real movement of thought in its auto-negation, as well as in its ignorance of its own truth at this stage of the myth of exteriority.

1. The subject faces the world, he observes the diversity of things.

*From the dialectical point of view, in truth it is necessary to understand that he constitutes himself as a subject by and for this “observation” of diversity--which is essentially the observation of infinite difference of himself compared to every other thing.*

2. The subject therefore necessarily *believes*<sup>1</sup> that things are before him, exterior, independent. True speech must then define the object *in itself*, that is to say, independently (the subject thinks, at this stage) of the “I” that judges him, perceives him, etc. Therefore, the object *in itself* cannot be the tangible object. This removal of self from truth results in the necessity of formal principles such as the excluded middle, since two contradictory determinations cannot coexist.

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<sup>1</sup> See note 2.

*From the dialectical point of view, the subject already knows<sup>2</sup> that he is truth, but he must still define himself as such--which he cannot do without a prior exit from himself: this is why it is necessary to set one's other, one's exteriority. However, once set, the thing is then non-true, and only the idea of the thing--its archetype or its intelligible form--can make sense.*

3. But in this position, everything is then confusedly possible since we do not know, in other words, the sufficient reason of things--but only their necessity *a priori* as pure form. It is in and through metaphysical formalism that all antinomies of rationalism are constrained to unfurl.

*It is confusedly that the thinking apprehends itself, and once more, since it sojourns in its own realm--the infinite, a realm that the thinking still does not grasp as such--all determination is conceivable at the same time. Indeed, because the thinking itself is always fundamentally the infinite, when it resolves itself to try all the conceivable formal demonstrations, the thinking is unable to find the coherence that it was searching for. It only finds its own truth that it does not yet recognize as such, because it has excluded contradiction from its logic. So, all conceivable determinations thus explored over several centuries necessarily fall through on the practice of the metaphysicists' dispute.*

The following contradiction appears: the mind spontaneously recognizes that truth is not exterior, but rather in its own labor of elaboration, as it seeks to give forms and contents of thought to things. Yet, to produce this work, the mind has first persuaded itself that objects are "brought before conscience." By this, it operates what common sense has the custom of calling a distancing. The mind *detaches* itself from its truth by setting the exteriority of the thing. But instead of considering this as a *necessary postulate*, or useful at the very least, the mind *totally* persuades itself of this exteriority as *objectivity*, i.e. as being the truth of the object.

In addition, on the one hand, the mind thinks that objects are independent and that it is situated as a subject before them; but this has as an *immediate* consequence that, on the other hand, the mind feels constrained to give them content of thought so that some knowledge be possible. The mind knows that it *is* truth, and yet it *believes* that objectivity is exterior. This is why Hegel can say that at this stage, thought is "*still without conscience of the opposition of thought in and against itself.*"

We have just oscillated between a classical approach and a dialectical approach. Through the classical approach, human understanding distinguishes steps 1, 2, and 3. This has the incontestable advantage of aiding our memory to *seize* what is *at stake*, what is happening in the reality of this process. However, this presents the following inconvenience: making us miss what is at stake as well as this effective and determining reality of what is going on.

Indeed, once the contradiction has been raised in the italicized comments that follow, we can understand the necessary nature of this contradiction. But, contrary to what the classical exposition, due to its simplistic nature, and my own simplification

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<sup>2</sup> From the classical point of view, this *knowledge* cannot be viewed as a belief, for we are therefore dealing with the fundamentally unconditioned, infinite nature of the thinking. However, from this non-dialectical point of view presented previously, the infinite is not always seized as such. Because of this, in non-dialectical writing, I use the verb *believe*, while here, I use the verb *know*.

inevitably mis-transcribe here, this necessity is not one of *need* but rather a logical necessity in the strict sense of what can only be as it is. In sum, the mind must first falsely believe that things have their truth in themselves, that truth is the *ob-ject*. It is only at the price of this resolution to finitude that the mind can modestly begin to realize its truth as a mind-- even though he thinks of himself at this stage as being a prisoner in the citadel of his conscience. The mind realizes its truth as a mind: that is to say to begin to *think the ob-ject*, and, furthermore, to give it form and life, even transforming it and making it exist differently than as it *was given* at the start. The thinking therefore needs an alteration of the object; it must think that the object is other than itself in order to be able to begin thinking it otherwise, *i.e.* he must transform it, and through this, make himself an acting subject. Yet, this work reveals that it is thought alone that renders the object tangible and real: each time the mind defines and sets an object, it is through the mind alone that the ob-ject exists as *Object* of a reflection.

Here, in the dialectical exposition of *action* therefore made necessary as a modality, thought elevates itself in its purest *truth* since it proceeds only in step with itself: the object is known as a thinking. But all that Hegel wishes to demonstrate is that at the stage, even though this *truth* is already effective, it is still ignored, or rather unconscious of itself.

We can therefore say that Hegel solves and surpasses the problem of dualism by simply denying any objectivity to the classical definition of truth. In short, Hegel tells us the way we define truth as adequation between form and content, between concept and thing--is in itself a simple methodological artifice, a tool that the mind first gives itself in order to determine its distancing from nature. It is therefore not and has never been an ontological affirmation and any error (we have understood, however, that it was a necessary error) will have been to believe that there was an ontological problem there.

Truth is thus the object that thought produces, what man creates: the masterpiece, friendship, the State are all indeed realities that exist only *for and through* us. However, to arrive to here it will have first been necessary that truth be ignored as such so that the thinking might resolve itself to act. We could almost compare the state of mind *before* the first position of the ob-ject to the ancestral knowledge of Lacan, since said knowledge is somewhat akin to the state of indetermination of the mind that resolves itself progressively, during earliest infancy, to set finite determinations around itself, so that before acting, there might simply be an *around the self*, a *here*, and a *now*. But in the end, all the work of the subject is indeed to constitute itself as such, that is to say as subject, and the *thing* evidently cannot simply be the ob-ject that I have set as being exterior. One must transform it, act, master it; to make it one's own as knowledge, an elaborated form, and then as a means of future actions.

These future actions will produce the object (*Das Objekt*) that is, then, nothing other than the Concept. The unity of concept and thing is *infinite* here; that is to say, on the one hand, that we cannot disassociate them. But this also means that it is a reality that thus creates itself, on its own, as a thought: the State, the paradigmatic example par excellence, creates itself in step with its concept and is only concept--but a concept that creates what it is the concept of. But if we seek another example taken from psychology, we can think of friendship, which Hegel himself does not forget to cite in this addition of §24. Indeed, when common language speaks of a *true friend*, said language clearly grasps what truth is as the unity of reality with itself as concept. The true friend which the adolescent still only treats as *best friend* defines himself on his own in the relationship that has created itself. I end up understanding that this reality has

arisen thanks to common effort, real effective action--and not thanks to any *a priori* concept.

If we want to simplify this further, we can also compare this definition of unity of truth to the mathematical concept. However, we must note that the infinity of mathematics is not the one which Hegel speaks of; it resembles it a great deal and it can even be said that the two are linked, but they remain different. Certainly, the circle is nothing else than its concept; the line is nothing other than the line, and 1 is nothing other than 1. Geometry would also allow us to illustrate what the infinite is: (something which we often think when teaching philosophy) the circle is an infinite number of points that are equidistant from another point called the origin, similarly to how the line or segment are themselves constituted. Everything in the world of pure thought is infinite and, in Descartes' manner, in this we think we find the most accomplished form of the thinking. However, the infinite of mathematics is *a property* of the mathematical concept: one of the line's properties is that of being infinite, yet mathematics themselves are not an *infinite* knowledge. The dialectical logic of the Concept, however, is infinite.

In order to more precisely understand this limit of logico-mathematical formalism in thinking the infinite, we can first imagine certain contradictions that mathematicians can only surpass with tremendous difficulty--if at all. Simply compare the functions  $f(x)=x$  and  $f(x)=x^2$ , and you will have to admit that  $f(x)=x^2$  is bigger. Yet both functions are infinite! You can repeat this criticism for any object in mathematics which deals with the infinite: two segments of different measurements are not equal, and yet both contain an infinite number of points. The infinite which Hegel speaks of is, as the title of his work indicates, the *logical* infinite. It is the veritable infinite. What does this mean? Hegel is clear enough on this point: the infinite is nothing other than the unity of the concept with itself. However, this unity is not a finite system of properties. The circle defines a *finite system*, just as the concepts of the masterpiece or the State *define themselves* perpetually in history. But the line is *indefinitely the same*, it is therefore *identity*, has a definition, it does not define *itself* on its own. We must therefore understand that if identity only exists abstractly, reality and logic are dialectical, since firstly, they are difference. Unity first conceives itself as a set of different elements gathered together in a whole that *defines itself* through its infinite *existence*: its becoming in itself; a self-becoming.

We must therefore represent the infinite to ourselves as what contains, in itself, all possible difference; all thought-forms. The logical infinite is thus something that *lives*, something that adapts itself and truly resides in any time and place. This is not because of the fact of an abstract and preconceived concept, but rather through and by *its* own experience. Just as the veritable State is the one that continually adapts itself to its people's culture rather than constrain it--in which case the State becomes a tyranny; a *bad* State--and just as the veritable friend is he with whom I *act* as a friend, the bad friend is therefore he who expects that you answer what he himself has predefined, without taking your difference into account, and vice versa.

Similarly, scientific truth is a bad truth, for if its reasoning can be perfectly exact, as such it is nevertheless non-true, bad, for it is in a contradiction with itself. The mathematical infinite is one property that is not able to explain itself mathematically. And, any object of study in general--although it may be perfectly described--completely escapes us from the moment that it is a finite object, always different from its concept. Based on these reflexions, we can then begin to understand why Hegel can say that truth is not exactitude.

Here, Hegel thwarts a widespread illusion: we think that the exactitude of a demonstration, or even the great precision of a physical theory, constitutes the truth of its concepts. However, exactitude does not refer to the objectivity of truth.

Once the example of the friend or of the State is understood, we know that what makes such an object is itself and not anything else; not a plan or a preestablished concept and imposition of authority. Indeed, we find this in art as well: many works of art are created each day, yet only a select few reach universal recognition. No one knows how to make a masterpiece beforehand. If this were the case, and if there was an exact *concept* of the masterpiece, then every artist could create such a work. Somehow, such an object is only here when *it wants to be*. Similarly, no one knows ahead of time how a State will organise itself : the State always fundamentally organises itself based on itself; based on its objective internal components, its citizens and their history. In logic we then say that the object is *inceptive*. This means simply that the object creates itself in time, step by step and almost like a foetus that develops cell by cell. However, in occurrence, it is not nature that determines the true object, but the mind, meaning the history and the culture of the time. The object is infinite when it *creates itself* as Concept; when it comes directly from the world of the mind and *only* from the world of the mind, all while effectuating itself as such in **reality**.

To the opposite, if I can construct an abstract modeling--for example with a body in movement in space--I am dealing with a finite object: an object that *is not* itself the concept that I am speaking of, that is frozen in time and space, is pure identity and therefore is pure abstraction. For example, when mechanics state “*that in the absence of any interfering force, any mobile is either at rest or animated by a uniform and continuous movement,*” they describe an *exact* law of nature. But this law in itself is a formalism that says nothing of *nature*. We can also say this in this way: mechanics do not state what mechanics are. We are dealing with thought-forms that, according to Hegel, are finite and tell us nothing about themselves or about **reality**, even though they describe what exists in a very exact fashion.

Thus, the thought-forms of most of our knowledge are non-true, and as such, Hegel tells us that they are bad. Does this mean that these thought-forms state the false? No; Hegel specifies this clearly: they are indeed things that exist. So how must we understand this contradiction?

In order to understand what the non-true means, we must reflect on the notion of negative magnitude; the difference between contrary and opposite. Here, we can say that the non-true is the opposite of truth. The contrary of truth is what is false. These are two different things. What is false is an *absence* of truth, an absence of any kind of adequation of our mind. The false is therefore contingent: without determination. Thus, it is not a thought-form, but simply an accident of thought: error. We can easily recognize an error, but on the contrary, illusion always takes upon the form of truth. There is a logical reason behind this: the non-true is not the false, but rather a negative truth; a simple opposite. A negative truth is always a truth. Just as -1 is as much a whole number as 1 is, the non-true is always in the nature of thought; it is always a thought-form. It is not an accident of thought, but a *mode* of thought.

Here, we approach the heart of the problem that Hegel endeavors to surpass at the beginning of the *Science of Logic*. Indeed, Hegel opposes the “ordinary conscience” to the “true conscience” (Ibidem p.479.) We can also say that when we recognize authenticity of a friendly gesture, we are inside pure and true conscience, while most of the time without even thinking about it, we content ourselves with our semi-friends, our superficial relationships with others, and our habitual prejudices. This is what we call, for example, *gossip*, a rumor, *image* or *social appearances*.

However, Hegel's remarks go much further than an analysis of our daily lives. This *ordinary conscience* is also that of the physicist who relates distance and time in order to determine the laws of gravity. Any physicist knows that if *in truth*, he had to look at all the *real* parameters of the laws he is considering, he would lose himself in potentially infinite calculations. For example, we can illustrate this by recalling that in *The Theory of the Movement of the Moon* (Charles-Eugène Delaunay, Mallet-Bachelier, Paris, 1860) Charles-Eugène Delaunay had to write out 1800 pages of mathematical formulas simply in order to describe the gravitational interactions of the sun and the moon. This gives us an idea of what it would take merely to describe the interactions of the solar system: it is simply *impossible*. Thus, any physicist knows that his task "*is to define which complex data of a system must be ignored.*" (GREENE, B. (2011), *The Hidden Reality*, Alfred A. Knopf, New York, 2011, p.109.)

## Conclusion

Thus, Hegel not only tells us that exactitude is not a synonym of truth, but moreover, this shows us that truth cannot be exact. So what is the meaning of the word exactitude? Well, the definition is in the text: exactitude is "the adequation of an object with our representation." That is to say, exactitude is what the usual common sense has understood as *truth* since Antiquity. Exactitude is the finite conception of truth; the bad truth.

And it is indeed what we see, even at the highest level of scientific research: theoretical physics. On the one hand, truth tends to content itself with finite determinations so that these determinations might reduce reality, until they reach the formalism of exactitude. But on the other hand, these determinations seek their truth as theoretical unity of all interactions: their method contradicts their search. Any physicist knows that, so that there may be exactitude, one must proceed by *reduction*: this reduction is the definition of a system of reference. For example, Newton's theory of gravity is only possible if we take a Galilean system of reference. But, *next*, we would like to be able to reopen the field of knowledge, and we then collide with this extraordinary incomprehension of science itself. This collision is illustrated by the example of string theory: since this theory offers the least possible experimentation, it currently finds itself confronted to the same hazards of classical metaphysics. And, like metaphysics, string theory does not see that what is interesting and compelling is the theoretical and conceptual course itself. This course is far more interesting than a final solution to all equations of physics, that, at any rate, contradicts the very method of its elaboration by its own nature. Once we have begun by pushing aside all philosophy and even judging philosophy as being necessarily suspect, because of its abstruse and speculative nature (while we have just found ourselves entering the realm of speculative philosophy,) seeking Unity of truth simply amounts to admitting oneself defeated as authentic knowledge. It also amounts to appealing to a scientific revolution that is yet to come, and whose form cannot be predicted by anyone to this day. But we can know what the science of tomorrow will be: it will be a discipline forced to detach itself from the empiricist dogma; it will have to surpass its sole methodological utility, and assume its speculative dimension. In order for this to happen, a rigorous method is necessary: one that is capable of assuming the diversity of the speculative models it will always be capable of producing and accepting that, in sum, any speculative logical model is valid provided that it be Conceptual; issued from the action and the ethics of scientific research. If the reader who has understood this article is scientific, and thanks to himself will have begun looking over the *Science of Logic*, he will understand why, for



example, that string theory is valid simply because it is *practical, elegant*, and resolves so many problems in physics. But, this informed reader will have once more understood that this theory is in itself condemned to being the object of perpetual declinations, that will give it different twists from one era to another—that are no less elegant. At this stage of science, philosophy and art come together.

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