

“Everything Rational is a Syllogism”

Hegel’s Logic of Inference

Georg Sans, SJ

Hochschule für Philosophie, München

Hegel’s *Science of Logic* is notorious, especially among Aristotelians, for its awkward identity claims, such as “being and nothing are the same,” “freedom is the truth of necessity,” or “the particular is the universal.” From a formal point of view, one might urge a careful distinction between identification (“being is numerically identical with nothingness”), classification (“being is a species of nothingness”), and predication (“being has the quality of being nothing”). However, as it turns out, Hegel’s very conception of what it is to be a concept goes against such a rigid separation. The Hegelian Concept¹ can be characterized by the three moments of being a general quality (the universal) as well as the species of a genus (the particular) as well as an individual (the singular). Each and every moment of the Concept is both the whole and one of its aspects. It is thanks to this kind of internal differentiation that the Concept can unite with itself in the form of a syllogism (*sich mit sich zusammenschließen*). When stating that “everything rational is a syllogism” (90; 588),² Hegel above all tells us something about the speculative Concept.

No matter whether what has been said so far is intelligible or not, it should be clear from the outset that Hegel’s conception of concepts and syllogisms is worlds apart from classical syllogistic. To start with, Hegel’s view of deductive reasoning is not limited to the consideration of merely extensional relations. Whereas ordinary syllogisms are founded on quantified judgments, expressing relations of inclusion between sets or classes (“all As are B,” “some Cs are D”), Hegel seems to nominalize quantifiers, so as to make “the universal,” “the particular” and “the singular” the three terms of syllogism. Furthermore, he is not much concerned with the formal principles of reasoning, as opposed to their

application in various fields of inquiry. Hegel's *Logic* rather deals with the semantic aspects of inference. Universality, particularity and singularity are interpreted not only as indicating different ranges, but as standing for various ways of conceiving the functioning of concepts. This peculiar methodology is meant to allow for achieving philosophical insight about concepts and their relation to reality in an a priori fashion.³

Notwithstanding these dissimilarities, if Hegel's doctrine of syllogism is assessed by its outer appearance, it presents itself as an odd mixture of traditional formal logic with specifically Kantian architectonic devices. Hegel's treatment of syllogistic figures and induction, for instance, is reminiscent of the former. To the latter the chapter on syllogism owes its structure, which partially follows Kant's table of judgments and categories. As depicted in Figure 10.1, Hegel distinguishes between several genera of inferences, namely qualitative syllogism or syllogism of existence, syllogism of reflection, and syllogism of necessity. These genera correspond to Kant's titles of quality, relation and modality. As each Kantian class contains three categories, every genus of syllogism in Hegel's *Logic* comprises three species. The first set encompasses the three figures known from Aristotelian syllogistic, whereas the second and third sets include other types of inferences, like induction, analogy, hypothetical and disjunctive syllogism.

A.	B.	C.
The syllogism of existence	The syllogism of reflection	The syllogism of necessity
a. First figure of the syllogism	a. The syllogism of allness	a. The categorical syllogism
b. The second figure	b. The syllogism of induction	b. The hypothetical syllogism
c. The third figure	c. The syllogism of analogy	c. The disjunctive syllogism

Figure 10.1

Hegel undertakes the discussion of all those forms of reasoning in order to offer an elaborate doctrine of conceptual thinking. Yet, he does not confine himself to dealing with abstract formulas or merely subjective operations. Instead, he considers the question of how the constitutive structures of reason are instantiated in reality. This is why the "Doctrine of the Concept" that makes up the second part of Hegel's *Science of Logic*, besides covering the traditional themes of formal logic such as judgment and syllogism, encloses chapters on topics like mechanism, chemism, teleology, life, the true and the good. What connects them among each other and with the issue of inferential reasoning is Hegel's conviction that conceptual relations as such are real. By an argument founded on the nature of syllogism and associated with the ontological proof for

the existence of God, Hegel maintains to establish the objectivity of the Concept. If the transition is sound, the argument leads to the twofold conclusion that, on the one hand, objectivity is to a certain extent conceptually structured and on the other hand, the Concept itself is a specific kind of object.

In what follows, I will initially give an overview of the three genera and nine species of syllogism distinguished by Hegel. The first genus comprises the Aristotelian figures of syllogism which, according to Hegel, form a circle of mutually justifying inferences (1). The second and third genera serve to disclose the ontological implications of inference. At this stage of the argument, it becomes indispensable to differentiate between concepts representing properties, concepts representing classes of things, and concepts representing metaphysical kinds. While the Hegelian Concept is conceived of as being all the three of them, its main feature is that of a really existing, objective universal (2). The paradigmatic case of an objective universal which can be described in syllogistic terms, is the solar system. A careful reading of the respective texts demonstrates that Hegel's doctrine of syllogism is essentially concerned with the different perspectives from which a complex whole may be considered. Each aspect is made explicit by a syllogism, the terms of which stand for the various moments of the systematic whole. The single syllogisms combine into a circle by the permutation of their middle terms (3). In the *Encyclopedia*, several triads of syllogisms are used for explaining the organization of objective universals, such as the state, or philosophy itself. For Hegel, syllogistic reasoning after all is concomitant with proving our conception of something to be rational (4).

1. The circle of the three syllogistic figures

Hegel starts his discussion by declaring that "the syllogism in its immediate form has for its moments the determinations of the concept as immediate" (92; 590). This statement requires clarification. With the moments of the syllogism Hegel does not mean its premises and conclusion, but its three terms. These terms are identified as the determinations of the concept (i.e. the universal (U), the particular (P), and the singular (S)). Such an interpretation of the syllogism seems to suggest an extensional reading, taking the determinations to be quantifiers. It is worth noting, though, that these quantifiers are not the traditional "all," "no," "some" and "some not." On the one hand, Hegel does not mention negative premises, so as to exclude two thirds of the 24 Aristotelian moods. On the other hand, the third moment of the Hegelian syllogism, appears to

be a singular term, whereas Aristotle's syllogisms contain exclusively general terms.

If we replace, for example, the determination of universality with "mortals," particularity with "humans" and singularity with "Gaius," we will obtain the following inference: "All humans are mortal. Gaius is a human. Therefore Gaius is mortal." Notwithstanding Hegel's moan about the boredom by which one is seized when hearing the spiel (95; 593), the three judgments make up a correct syllogism. The subject and predicate of the conclusion, which constitute the extremes of the syllogism, are mediated by a third term which functions as subject in the major and as predicate in the minor premise. Quoting just the three terms, we obtain "Gaius—human—mortal," or schematically "S—P—U," Hegel's formula for the first figure syllogism.⁴

One might still wonder about the exact meaning of Hegel's schema. In classical formal logic the variables stand for any concept. If the propositions "all As are B" and "all Bs are C" are true of a triple of concepts, then so will be "all As are C." The same relations can be expressed set theoretically by saying that set A is included in set B which in turn is included in set C. Consequently, it may be claimed that C is "the universal" in proportion to A and to B. But what applies to a syllogism of the form Barbara, obviously does neither hold for Celarent nor for Darii. If "all Ds are E," and "no E is F," then F cannot be considered "the universal" with respect to D and to E. Likewise, if "some Gs are H," and "all Hs are J," then G may or may not be more "universal" than H and J.⁵

Even less evident is the way in which Hegel uses the other two determinations of the concept. In the syllogism Barbara, B is "the particular" in proportion to C, but A is also "the particular" in proportion to B and to C. Furthermore, according to Hegel's schema, A has to be "the singular," which rules out all minor premises as well as conclusions with a plural subject. Only by strictly limiting the discussion to modus Barbara and to syllogisms with a singular premise, like in the example cited above, it seems plausible to identify the three terms with the determinations of universality, particularity, and singularity.

Hegel describes the function of a syllogism fundamentally as mediating between two concepts, namely between the subject and the predicate of a judgment. The judgment demands for mediation in the sense that it lacks justification. The middle term of the syllogism founds its conclusion. If Gaius is actually mortal, then this is because he is human. Hence the syllogism is not so much a series of three propositions, as a judgment supplemented by its conceptual foundation. In Hegel's schema, the middle term—figuratively speaking—replaces the copula. Subject and predicate of the conclusion are linked in virtue of an

additional concept. In Hegel's words: "Singularity connects [*schließt sich zusammen*]⁶ with universality through particularity" (93; 590). In the *Encyclopedia Logic*, Hegel specifies that "a subject as individual is joined together [*zusammengeschlossen*], through a quality, with some universal determinacy" (§ 183; 256). By asserting that Gaius is mortal, the singular subject Gaius is connected with the universal determination of mortality by means of the feature of being human. Gaius' mortality is thus justified by its humanity insofar as all humans are mortal (first premise) and Gaius is a human (second premise).

The nexus between conceptual mediation and justification is already present in Hegel's lessons of philosophical propaedeutic taught at the Gymnasium in Nuremberg, where he states that the syllogism "contains, as such, the judgment with its ground."⁷ The grounding function of the middle term has been a widely accepted idea for a long time and indeed goes back to Aristotle's *Posterior Analytics*.⁸ In the Enlightenment philosopher Ernst Platner's *Aphorisms*, used by Fichte as a textbook for his Jena lectures, the syllogism is defined as "a judgment with an added reason." The reason is "that by which it is understood why the—affirmative or negative—predicate belongs to the subject."⁹ Similarly, for Hegel, the difference between a mere judgment and the conclusion of an inference lies in the foundation on which the latter "as the mediated connection" (94; 592) is grounded.

While the conclusion of a syllogism is justified by its premises, the premises as such are immediate judgments and in need of further justification. Although the inference is necessary, the conclusion of a qualitative syllogism is only hypothetically true: If all humans are mortal, and if Gaius is a human, then Gaius is mortal. However, even if not all humans were mortal, the inference as such would still remain valid, without Gaius being necessarily mortal. For this reason scientific explanation is usually an open-ended process. Since a conclusion is no better than its premises, the search for justification continues with the mediation of uncertain premises.

For traditional formal logic all this does not constitute a major issue, because logical inquiry is limited to the study of the abstract rules of reasoning. The empirical sciences, on the other hand, look for experiential evidence on which to base their knowledge claims. Hegelian speculative reason on its part cannot settle for the former and is barred from the latter. The *Science of Logic* strives to provide new insights by developing pure thought-determinations, one of which is syllogism as the form of conceptual mediation. Hegel consequently is wondering how complete mediation is possible in pure thinking. As we have seen so far, in the syllogism of the first figure, the conclusion is based on two unfounded premises. In order to mediate also these premises, two additional inferences would be needed, one to found the first premise, the other to found

the second premise. But this move obviously cannot improve the situation. On the contrary, now there are four premises that lack justification instead of previously two. Schematically the problem may be depicted as shown below in Figure 10.2. The attempt of complete mediation appears to lead to an infinite progression of proofs.

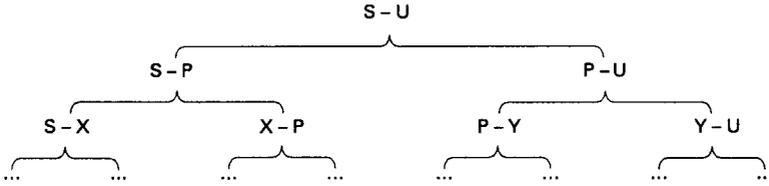


Figure 10.2

To avoid such a progress to infinity, Hegel introduces yet another way of mediating the premises, namely by means of the respective third term. The premise S—P is thus justified by the universal U, the premise P—U is justified by the singular S. In this way the second and third figures of the syllogism are derived from the first as presuppositions of its premises. The second figure (P—S—U) combines the three determinations of the concept in a different order from the first, in that the subject of the conclusion of the latter has become the middle term of the former. The third figure (S—U—P) represents still another combination of the same three moments, with the remaining determination at the center. Hence the premises of each species of syllogism are founded on the other two inferences, while the three figures as a whole are based on the permutation of terms as illustrated in Figure 10.3. The process of mediation thus results in a “circle of reciprocal presupposing” (105; 603) formed by the three types of qualitative syllogism.¹⁰

From a methodological stance, the replacement of an infinite progress with a circle does not make a big difference, because either argument seems aporetic. According to Hegel, however, another consequence can be drawn which has both a negative and a positive side. On the negative side, Hegel polemicizes against the formalism of syllogistic reasoning. He rightly observes that syllogisms of the second and third figures do not lead to much insight into their subject matter. Since they rest on either negative or particular judgments as premises, their conclusions are of limited range.¹¹ As long as the form of syllogism is understood in an abstract way, “only totally empty results are produced” (108; 607). Alluding to Kant’s essay on *The False Subtlety of the Four Syllogistic Figures* and chastising the standard textbook accounts of logic, Hegel remarks that one

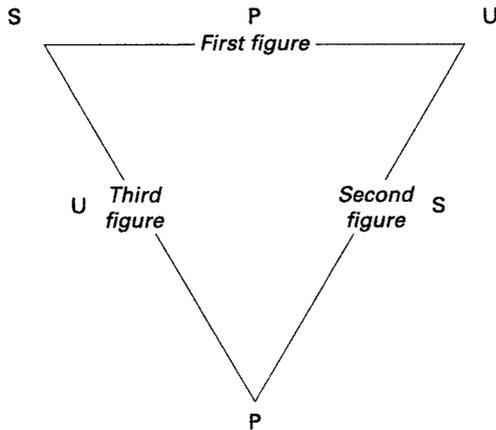


Figure 10.3

should not be surprised if the Aristotelian figures “have later been treated as an empty formalism” (§ 187; 259).

Nevertheless, the statement of formalism is only one side of the coin. The other side is “the positive result, namely that mediation occurs, not through any single qualitative determinateness of form, but through the concrete identity of the determinacies” (106; 604). Complete mediation can only be achieved if all three moments of the concept function one by one as middle term. The circle of the three syllogistic figures for Hegel has a profound sense which “rests upon the necessity that each moment as a determination of the concept becomes itself the whole and the mediating ground” (§ 187; 259).

2. Ontological implications of inference

At first glance, Hegel's development of the syllogism of existence is a failure. Although by connecting the three figures he obtains complete mediation of all premises, the result appears to be an empty formalism. This state of affairs makes it difficult even to imagine how the transition to further types of inference will be brought about. After exhausting the method of permutation, another sort of consideration is needed. As in all chapters in the *Science of Logic*, Hegel presents the development of different forms as a dialectical movement in the course of which categories are determined step by step. His method, in a nutshell, consists of introducing new categories or forms that express the conceptual content more adequately than their respective predecessors.¹² This procedure leads to a

semantic enrichment, as can be easily seen from the structure of the book. Categories such as “judgment,” “mechanism” or “life” (Doctrine of the Concept) are more complex than “ground” or “appearance” (Doctrine of Essence), which in turn are richer than “existence” or “quantity” (Doctrine of Being).

Regarding qualitative syllogism, Hegel initially takes the three figures to be a mere aggregate of distinct forms. As long as no further specification is supplied, there is just a set of syllogisms, each with a different middle term. Syllogism as a genus can be characterized by enumerating the various figures, though without pretending completeness of the list. From there the transition to still another form of inference is motivated by the concern that if the true nature of syllogism amounts to nothing more than being a set of inferential forms, then it will be represented best in terms of inductive reasoning. To claim something about the syllogism in general means first to indicate the three figures with the determinations of universality (U), particularity (P), and singularity (S) as middle terms, and second to highlight their common trait of being a mediated connection of concepts. Hegel thus describes induction as “the syllogism of experience—of the subjective gathering together of singulars in the genus, and of the conjoining of the genus with a universal determinateness on the ground that the latter is found in all singulars” (114; 612 f.).

While it may seem obvious that an empirical conception of inference is not applicable to formal reasoning nor to speculative logic, Hegel calls into question even its everyday use and scientific worth. Indeed, a contingent list of premises cannot be guaranteed to be complete, nor can the occurrence of counterinstances be excluded for certain. The fact that all the many swans observed so far have been white, neither implies that no other swans exist, nor does it mean that you will never find a black swan. But if the syllogism of induction, Hegel continues to wonder, just gathers the singular instances in a class, it remains unclear what makes them members of the same genus. This doubt ushers in the next form of inference, namely the syllogism of analogy.

Hegel’s example of a syllogism of analogy is the erroneous reasoning: “The earth has inhabitants. The moon is an earth. Therefore the moon has inhabitants” (115; 614).¹³ To underscore the superficiality of the analogy, Hegel argues that inferring something’s having inhabitants from its being an earth calls for clarification of the nature of the middle term. If the syllogism is supposed to work, the concept “earth” cannot simply refer to something concrete, but must be taken likewise as a “universal nature” (117; 615). Only if having inhabitants constitutes an essential attribute of a heavenly body’s being an earth, the analogy yields its conclusion. In this case, however, we are already beyond the stage of

induction and analogy or, as Hegel calls it, the syllogism of reflection. The validity of the conclusion no longer depends on the singular items, nor on the similarities existing between them, but on their essence or nature.

The standard example of the categorical syllogism quoted above has the advantage of being grounded precisely in a middle term that expresses “the objective universal, the genus” (117; 616). The word “human” is used both as an adjective and as a noun. In the first case the term seems to signify a universal property, in the second case it denotes a singular subject or substance. The two are made possible by the fact that humanity as a natural kind possesses a certain set of attributes which necessarily belong to every individual of the genus. Gaius is mortal not just because he has the feature of being human, nor because all humans happen to be mortal, but because mortality is an essential note of humanity. What I have called a semantic enrichment thus reveals itself to be an ontological commitment. Inferential reasoning as such requires an essentialist perspective on the middle term. If the syllogism is founded either on abstract qualities or on sets of things, no conceptual insights will be obtained so that our knowledge remains strictly limited to the realm of empirical facts.

In the chapter on syllogism Hegel makes a clear case for an essentialist conception of concepts. A true concept expresses the nature of the things falling under it in that they necessarily instantiate the essential attributes comprehended in the concept. Without a similar ontological commitment it would be impossible to gain knowledge through concepts. A similar reading of the syllogism chapter finds further confirmation in the fact that Hegel's list of syllogisms otherwise would contain three identical items. The first figure of the qualitative syllogism, the syllogism of allness, and the categorical syllogism all actually have the same form. If there were no semantic differences, they would also agree in content. But even though Hegel's system of syllogisms shows obvious reminiscences to Kant's tables of judgments and categories, its order should not be simply dismissed as artificial. The distinction between three classes, corresponding to Kant's titles, rather points to various ways of interpreting the middle term. In the syllogism of existence, mediation is thought to be realized by a particular quality, in the syllogism of reflection by a set of singular things, in the syllogism of necessity by the universality of genus.

As it turns out, only the last interpretation of the middle term actually makes it possible to acquire inferential knowledge. Only if the conclusion is grounded not on observation, or any other empirical evidence, but on a genus concept, singular objects can be said to necessarily possess certain attributes. This means that only the third of the aforementioned species of syllogism is more than a blank formalism, because its middle term bears conceptual content.

Hegel's argument in the *Science of Logic* doctrine of syllogism thus boils down to establishing the categorical syllogism as the true form of inferential reasoning.

There are, however, two shortcomings in this reconstruction. The first is that two other forms of inference still follow, namely hypothetical and disjunctive syllogism. The second difficulty is that so far we have been talking about ordinary concepts (e.g. the concept of humanity), whereas Hegel is concerned with the concept of the Concept. His "Doctrine of the Concept" is not so much an investigation of whether and why "humanity" warrants Gaius' mortality, as a study on the determinations of the speculative Concept and their interrelations. Hegel's overall aim is to prove that the three moments of universality, particularity, and singularity constitute an objective whole, or genus.

The remaining two forms of syllogism serve the purpose to make explicit what kind of concept is presupposed by the categorical syllogism. Hegel, more specifically, intends to establish the real nature of the middle term. The final step of his argument, which comprises the hypothetical and disjunctive syllogism, reveals the genus or objective universality as something existing. Hegel's consideration is roughly the following: If the genus concept is to ground the conclusion, there has to be a necessary relation between a singular object's being a member of the genus (Gaius' being human) and its possession of certain essential properties (Gaius' being mortal). This relation, as Hegel sees it, is expressed by a syllogism of the form: "If A is, so is B. But A is. Therefore B is" (121; 620).

This move is rather bewildering, since the hypothetical in contrast to the categorical syllogism comprises only two terms which are so to speak extremes without a middle.¹⁴ Moreover, the premises in the formula above are existential instead of predicative judgments. As Hegel sees it, the hypothetical syllogism adds the "immediacy of being" (*ibid.*). These irregularities notwithstanding one may still see the hypothetical syllogism as expressing exactly the function fulfilled by the middle term of the categorical syllogism. The latter provides conceptual knowledge on the condition that every specimen of the genus possesses a certain essential quality. In other words: whenever there is an instance of A (for example, being human), there is also an instance of B (being mortal). The expression "an instance of" disguises the difference between the classification in a genus and the predication of an attribute. Although this may seem formally incorrect, it does not cause any trouble, as long as the Hegelian Concept is thought of as something which is universal in the sense of both genus and attribute. The hypothetical syllogism then does not change the perspective of the

preceding passages, namely to make explicit the necessity to interpret the middle term of the categorical syllogism as objective universality.

This line of argument is completed in the section dedicated to the disjunctive syllogism. Whereas Hegel's hypothetical syllogism tallies with the traditional *modus ponens*, his disjunctive syllogism is equivalent to *modus tollendo ponens*, obeying to the following rule: "A is either B or C or D. But A is B. Therefore A is neither C nor D" (124; 622). By the subject term A Hegel now means the objective universal.¹⁵ The predicates B, C, D can be seen as species which form the genus A. This explains why A's being B necessarily implies it not being C nor D. It is characteristic for objective universality to realize itself in several forms which constitute a whole by reciprocally excluding each other. This analysis explains the apparent oddity that the formula for Hegel's disjunctive syllogism consists of four instead of three terms. The discrepancy is unavoidable whenever various subsets are said to belong to the same class. By claiming, for instance, that all cycles are either pedal-powered or motor-powered, one uses three terms for defining two different species of two-wheelers. The same applies for the "mediating means" (*Vermittelnde*) in the Hegelian syllogism: it is "the universal sphere of its particularizations" and at the same time "is determined as a singular" (124; 623). Thereby it should be clear that the "middle" (*Mitte*) here does not denote an alleged central term of the disjunctive syllogism but rather that concept which could serve as mediator in the categorical syllogism, and the constitution of which is made explicit by the disjunctive syllogism.

From the perspective of speculative logic, the term A thus has to be regarded as the Concept, with B, C and D representing the three moments of universality, particularity and singularity. The main feature of the Concept as objective universal is its being both particularized and determined as a singular. The singularity, for Hegel, is instantiated through the negative relation holding between each moment and the others. Since the disjunctive syllogism is emblematic for "the unity of the mediator and the mediated" (124; 623), Hegel finally declares that "the form of the syllogism, which consisted in the difference of the middle term over against its extremes, has thereby sublated itself" (125; 624). As a result of the "sublation of the mediation" (126; 624), the conceptual scheme of formal logic—judgment and syllogism—does not any longer suffice for expressing the true nature of the Concept. Hegel introduces the category of "objectivity" for further determining pure thought. He labels this step the "realization of the concept," comparing it with Anselm's as well as Descartes' ontological argument for the existence of God (§ 193; 265–268). Like the idea of

the most perfect being implies its existence, the concept of the Concept suggests a really existing, objective universal.

3. The paradigmatic case of the solar system

The syllogism chapter aims at establishing the Concept as something objective, to wit really existing. In the subsequent section of the *Science of Logic*, Hegel explains the specific “objectivity” of the Concept with the help of the categories of mechanism, chemism, and teleology. The corresponding chapters always struck readers as odd because of the difficulty of avoiding the impression that after dealing with mental activities such as judging and reasoning, the author now passes to the treatment of physical objects in space and time. In such a case, Hegel would have to be blamed for merging the sphere of pure logical thinking with the realm of nature. It is worthy of note, though, that a similar objection could already be leveled against interpreting logical subjectivity as something mental, thus assigning judgment and syllogism to the philosophy of mind. Hegel clearly refused both interpretations. Subjectivity as well as objectivity are determinations of the Concept as such and do not refer directly either to mind or to nature. The neutral stance becomes evident when Hegel describes mechanism, chemism, and teleology themselves as syllogisms. For the sake of brevity I will engage only with “absolute mechanism” which is arguably the most elaborate case of syllogistic reasoning in Hegel’s *Logic*.

Hegel distinguishes several types of logical mechanism depending on which kind of forces are thought to act on a body. The simplest case of moving force is pressure or impact, as exemplified by one billiard ball colliding with another. Such a mechanism is far from being absolute because the pushing body usually receives its drive from a third one, and so forth. Whether a ball hits the next mainly depends on the forces which act on them. The mechanical process of action and reaction is triggered by external factors which leave the object as such intact. After rejecting its depiction in terms of matter and form, or as a thing with properties, Hegel deploys the moments of universality, particularity, and singularity for further clarification. When one body interacts with another, communicating kinetic energy to it, “their identical universality is posited.” This universal form yet does not sublate the particularity of each object. On the contrary, the universality “particularizes itself only in their diversity;” in that one body is acting, the other is reacting. What occurs here is “a reciprocal repulsion of the impulse.” By repelling the impact, the mechanical object for Hegel

demonstrates its self-subsistence. When mechanically speaking action “passes over into rest,” logically speaking the particular object “returns to singularity” (138 f.; 636 f.).

In summarizing the process delineated so far, Hegel puts his considerations in syllogistic form: “Immediately, the object is presupposed as a singular; then as a particular as against another particular; but finally as indifferent towards its particularity, as universal. The product is the totality of the concept previously presupposed but now posited. It is the conclusion [*Schlußsatz*] in which the communicated universal is united [*zusammengeschlossen*] with singularity through the particularity of the object” (139; 637). One and the same physical body hence combines in itself all three moments constitutive of the concept. Abstractly considered, it is just a singular thing; seen in connection with another body acting on it, the object becomes something particular; from the perspective of the equality of action and reaction, it is universally determined. Finally Hegel associates the product of the mechanical process with the logical scheme S–P–U of the syllogism. Even if the object is in rest, it receives its determination by the mediation of another body.

The foregoing statement of the unity of self-subsistence and mediation is merely formal. It applies indistinctively to any mechanical object. Physical bodies characteristically do not possess internal determinations but are only externally interrelated. In kinematics they are idealized as moving point masses. Hegel's story, however, does not finish here. Despite their apparent independence, the manifold objects form a complex whole called absolute mechanism. The unity of the whole for Hegel is represented by the center (*Zentrum*) or central body (*Zentralkörper*) towards which all the other objects strive (142 f.; 640 f.). The mechanism is absolute in the sense that the various bodies are in motion without being driven by an external force, as can be seen by the examples of objects falling to the Earth, or planets circling around the Sun. Neither free fall nor orbital motion is communicated by impact or pressure. They depend on the relation between falling or gravitating bodies and the said center. Hegel designates the latter “the individualized universality of the single objects and their mechanical process” as well as “the real middle term [*reale Mitte*]” through which the objects are united (*zusammengeschlossen*) in and for themselves (143; 641).

Which then is the syllogism of which the center of absolute mechanism is the real middle? So far we have encountered only two terms, namely the single objects and the central body. Hegel yet introduces a further distinction between what, in celestial mechanics, are called planets and satellites respectively. A planet is an object both orbiting the central body and orbited on his part by other,

smaller bodies. "These second centers and the non-self-subsistent objects are brought into unity [*zusammengeschlossen*] by the absolute middle term" (144; 642). The syllogistic structure of absolute mechanism may be exemplified, for instance, by the triad of Earth, Sun and Moon. The relation between Earth and Moon is intelligible on the basis of their common interaction with the Sun as the center of mass.

It should be added immediately that the absolute mechanism, in contrast to the mechanical process considered above, is not encompassed in one single syllogism but in a circle of the three syllogisms. As sketched in the preceding chapter, the remaining figures evolve through the permutation of the middle term. Thus, Hegel explains, "the relative individual centers themselves also constitute the middle term of a second syllogism. This middle term is, on the one hand, subsumed under a higher extreme, the objective universality and power of the absolute center; on the other hand, it subsumes under it the non-self-subsistent objects." To complete the series, the third term also has to function as mediating means. "These non-self-subsistent objects are in turn the middle term of a third syllogism, the formal syllogism, for since the central individuality obtains through them the externality by virtue of which, in referring to itself, it also strives towards an absolute middle point, those non-self-subsistent objects are the link between absolute and relative central individuality" (*ibid.*).¹⁶

Passing through the circle of the three syllogistic figures for Hegel is first and foremost a mark of systematicity and, as a result, rationality. Since inferential knowledge is specific to reason, being brought into the form of a syllogism is tantamount to being rational. Complying with reason on the other hand means absoluteness, or independence, or self-sufficiency (*Selbständigkeit*). The planetary system is an absolute mechanism in that it is completely governed by the law of gravitation. No further inner qualities or external forces are needed for differentiating the objects or explaining the processes which make up the whole. While the development of Hegel's speculative logic obviously has not yet reached its final stage, the category of mechanism already foreshadows the perfect unity between conceptual ideality and reality as well as between freedom and necessity. Hegel dubs the law of absolute mechanism paradoxically "free necessity" because "in the ideality of its difference it refers only to itself" (146; 644). Besides the blatant reference to Spinoza's metaphysics, the formula indicates a process of gradual self-differentiation that generates complex determinations without external impact.

It is astonishing, to say the least, that the most extended application of inferential reasoning in Hegel's system is found in the mechanism chapter of the

Science of Logic. One reason may be the proximity to the doctrine of syllogism. With the three figures and genera still fresh to the mind, both author and reader will more easily grasp the hidden conceptual structures which determine the logical categories as well as the corresponding reality. The case of the planetary system then is paradigmatic because in accordance with the three syllogisms just as many kinds of moving forces can be distinguished. The first and most abstract sort of relation is represented by pressure and impact. Mechanical objects formally considered are indifferent with respect to the forces exercised by or upon them. On a second level, however, there is an essential difference between a celestial body that attracts smaller objects, and these objects falling towards the central body. The center defines the force field in which the objects lacking self-sufficiency are located. In the third and final type of mechanism, attraction and fall are replaced by gravity. Hegel portrays the latter as the "objective universality" which "persists self-identical in the particularization" (145; 643). One and the same law of gravitation determines all of the particular objects forming the system.

The relation between several mechanical objects hence can be considered from a threefold perspective: as pressure and impact, as attraction and fall, or as gravitation. What makes the planetary system paradigmatic for inferential reasoning is the amalgamation of these three aspects, each correspondent to one of the syllogistic figures, with three types of celestial bodies, each correspondent to one of the terms. As we have already seen, apart from the absolute center (universality) and the non-self-subsistent objects (particularity), the absolute mechanism incorporates relative individual centers (singularity).¹⁷ Like the Earth that stands in the middle between the Moon and the Sun, the relative centers combine centrality, or self-sufficiency, with dependency. In sum, what makes up a system of syllogisms is the connect between a triad of terms with as many perspectives.

4. Other triads of syllogisms

Although the category of mechanism has its paradigmatic application in the solar system, its use is not restricted to the realm of physics, or nature in general. In the *Science of Logic*, Hegel in fact coins the term "spiritual mechanism" and describes it as consisting in "the things connected in the spirit remaining external to one another and to spirit" (133; 631). When somebody recites a poem in a monotonous voice, devoid of any emotion, she may be relying on mechanical memory which connects the words externally without attaching a sense to them.

Or when devout people perform their prayers and fulfill their rituals in a detached and uninvolved manner, they could be said to act mechanically (cf. § 195 Remark; 270 f.). In both cases the spirit seems to operate without considering the meaning and implications of what is said or done. As the “pervasive presence that is proper to spirit” is lacking (133; 631), spiritual mechanism is contrary to self-conscious freedom.

Hegel’s talk of spiritual mechanism should not be taken in a reductionist sense, as if the human mind was reduced to a machine. Spirit certainly belongs to a higher domain of reality than the planetary system, and is far too complex to be explained in terms of mechanism. However, as always in Hegel’s system, with the advancing development of the Concept the earlier categories are not completely abandoned but sublated into the later ones. The concept of objectivity, for instance, takes up the previously explicated determinations of being, existence, actuality, and substantiality (cf. 130; 628). In a similar way, the idea of life supposes mechanical and chemical processes (cf. 189; 686). Likewise some operations of the human spirit can be described as mechanical, though spirit as such transcends mechanism. This is the reason why “in things spiritual the center, and the union with it, assume higher forms” (143; 641).

The clearest example is the analogy drawn by Hegel between the solar system and the state. “The government, the individual citizens, and the needs or the external life of these—Hegel declares—are also three terms, of which each is the middle term of the other two.” (144 f.; 642) As the list makes evident, the three terms cannot be simply identified with various things, entities, or substances. Since all elements of the planetary system are celestial bodies with different masses, one might have expected the moments of the state to be the citizens with their respective social roles, such as for instance the three estates (clergy, nobility, commoners) in the Ancien Régime, or the three branches of government (legislative, executive, and judicial). Hegel yet draws a more complex picture of the social organism.

The state is seen from different perspectives which are displayed by the triad of syllogisms. He briefly characterizes each of the three syllogisms, beginning with the moment of universality constituted by the government. It is “the absolute center in which the extreme of the singulars is united [*zusammengeschlossen*] with their external existence.” The middle term of the next syllogism is the individual citizens, who “incite that universal individual into external concrete existence and transpose their ethical essence into the extreme of actuality.” In the third and final syllogism “the singular citizens are tied by their needs and external existence to this universal absolute individuality” (145; 642).

In a remark to the *Encyclopedia Logic* Hegel repeats the same considerations at greater length and in a slightly different order. Because of its pertinence to our topic, it is worth quoting the text in full before commenting on it:

(1) The individual (the person) joins itself through its particularity (physical and spiritual needs, what becomes the civil society, once they have been further developed for themselves) with the universal (the society, justice, law, government).

(2) The will, the activity of individuals, is the mediating factor which satisfies the needs in relation to society, the law, and so forth, just as it fulfils and realizes the society, the law, and so forth.

(3) But the universal (state, government, law) is the substantial middle [term] in which the individuals and their satisfaction have and acquire their fulfilled reality, mediation, and subsistence.

§ 198 Remark; 273

These three phrases arguably constitute Hegel's most explicit statement of syllogistic reasoning in the practical sphere. He concludes the remark with the declaration that "it is only through the nature of this joining together, through this triad of syllogisms with the same *terminis*, that a whole is truly understood in its organization" (ibid.). The state is seen not so much as the union of its citizens which like atoms compose a molecule, or like members form a body. The individuals' specific contribution to the understanding of the social whole rather consists in their being subjects of self-conscious will and activity.

The second stage of Hegel's argument turns on the mediation between the particular interests and desires propelling people, on the one hand, and the universal norms governing social life, on the other. The adjustment between the two extremes depends on the citizens' free self-determination. Pursuing both the satisfaction of their own needs and the actualization of common values, every singular person aims at reconciling particularity with universality. The mediating principle is the people's willing and acting. The economic system as well as the socio-political institutions, for Hegel, are no impersonal processes or structures which escape human influence, but manifestations of our free will and activity.

Like the planetary system, the triad of syllogisms originates in the permutation of terms so that "the mediation joins each of the determinations with the other extreme" (ibid.). Again, like physical mechanism, the three syllogisms represent several types or levels of mediation. Hegel, in other words, distinguishes three ways of conceiving social unity, namely in the first place as determined by economic requirements; in a second moment as facilitating personal self-fulfillment; or finally as directed towards the implementation of universal

norms.¹⁸ The first syllogism thus corresponds to the point of view of what Hegel calls the civil society, in which all individuals or singular families tend to achieve their respective physical and spiritual needs. The second syllogism stresses the volitional character of social organization and the active part citizens have to play in the construction of society. Without the third syllogism these considerations would ultimately amount to a liberalist conception of the state, with political institutions confined to a functional role either for the development of the economic sector or for the exercise of individual liberty.

Hegel then adds the aspect of universality as represented by the political institutions and the constitution of the state as a whole. Fundamental ethical norms in a society are to be preserved through legislation, governance, and judicature. The third type of mediation is as essential as the preceding ones. If the convictions of a people are not brought into a constitutional order, they will remain literally ineffective. The different aspects of the three syllogisms, though, reveal the true nature of the social organism only if taken together. A society that does not satisfy its members' material needs, or disregards their freedom of choice, would be equally defective as a community that does not give itself a political constitution in accordance with common ethical norms.

Nevertheless, as Hegel sees it, the third syllogism performs the function of integrating the preceding moments into a complex whole exemplifying objective universality. In the realm of physics this results in the primacy of gravitation over impact and attraction, in the case of the state it leads to the supremacy of politics over economy. Hegel certainly subscribes to the claim that the common good takes precedence over private concerns, but the main issue here is that political institutions by their nature are meant to solve the tension between particular needs or singular wills, on the one hand, and a vision of the whole on the other hand. With Karl Popper in mind, it could be objected that the excesses of holism are still more harmful and dangerous than any kind of liberalism. In contrast, Hegel points out that, as the gravitational system is not just a set of bodies impacting one another, the constitution of the state is more than a mere mechanism of balancing interests. Without necessarily implying that political procedures should not be understood as a mechanism at all, Hegel deploys his syllogistic method to arrive at a more adequate conception of the state as a whole.

Notwithstanding the succeeding chapters are scattered with syllogistic vocabulary like "premise," "middle term," "inference," or "conclusion," Hegel admittedly offers no further elaboration of his method. In the *Science of Logic*, he explicitly talks of three syllogisms which constitute the totality of chemism (cf. 152; 649).¹⁹ When dealing with teleology, he associates the means (*Mittel*) with

the middle term (*Mitte*) of a formal syllogism (cf. 163; 660), mentioning again three syllogisms (cf. 171; 669).²⁰ In the *Encyclopedia Logic*, Hegel denotes the idea of life as “the syllogism, whose moments are systems and syllogisms in themselves.” By the moments he means the mechanical, chemical, and teleological processes which conjointly make up living, understood as “the process of its coming to closure together with itself [*Zusammenschließens mit sich selbst*]” (§ 217; 288). In the *Philosophy of Nature*, Hegel characterizes his way of determining the notion of gravitation as the “syllogism of totality, which is in itself a system of three syllogisms.”²¹ A few paragraphs later, he remarks about the chemical process that its complete exposition would require “that it should be explicated as a triad of intimately interrelating syllogisms,” referring without much ado to the aforesaid section 198 of the *Encyclopedia Logic*.²² With regard to the animal organism, Hegel claims that it “passes syllogistically through its three determinations,” namely the formation of shape, the assimilation of stimuli and nutriment, and reproduction. Since the three processes concern one and the same animal, “each syllogism is implicitly the same totality of substantial unity, and [. . .] at the same time the transition into the others.”²³

Even though the state in Hegel's *Logic* is presented as a system of syllogistic inferences, neither his *Philosophy of Right* in general nor the section on the state in particular take up the alleged triad. To be sure, Hegel makes ample use of syllogistic discourse, but it is far from obvious which syllogisms, if any, form his system of right.²⁴ In the *Encyclopedia*, it is not before the end of the section on absolute spirit that the pattern of interrelated syllogisms is again employed. After explaining the several moments of Christian religion, from God's nature via the creation of the world and the incarnation of Christ to the effusion of the Holy Spirit, Hegel speaks of the revelation as “three syllogisms, which constitute the one syllogism of the absolute mediation of spirit with itself.”²⁵ I have shown elsewhere that each syllogism stands for another aspect of religion, namely the history of salvation, the justification of man, and God's essence as absolute spirit.²⁶ Let me just repeat the crucial point that, according to Hegel, the three perspectives follow each other in ascending order. From a merely external representation of particular past events, religion proceeds to the conversion of the singular person culminating in the believers' universal unity in God.

In Hegel's system, religion is surmounted by philosophy as conceptual knowledge of the absolute which manifests itself in pure thought, in nature and in spirit. Not surprisingly, Hegel takes the triad of syllogisms to be the best pattern for explaining the unity of these moments. The concluding syllogisms of the system are meant to show that logic, nature and spirit constitute one

conceptually determined whole. In the last sections of the *Encyclopedia*, Hegel indicates the syllogisms, the first of which has “nature as the middle that joins [*zusammenschließt*] the spirit together with the logical” (§ 575), in the second syllogism spirit “is the mediator [*Vermittelnde*]” (§ 576), whereas the third “has self-knowing reason, the absolutely universal, for its middle [*Mitte*]” (§ 577).²⁷ As in the other triads so far discussed, the permutation is not just a formalism but mirrors different senses of mediation. In the first instance the mediation has “the external form of transition,” the second syllogism relates to the standpoint of “subjective cognition,” whereas the third portrays philosophy as “self-knowing reason.”²⁸ While the last syllogism includes the highest and speculatively true perspective, the others cannot be simply dispensed with. The permutation of terms rather exhibits the indissoluble unity of the three moments.²⁹

This result is admittedly far away from inferences in the fashion of Aristotle’s *modus Barbara*. The Hegelian doctrine of syllogism is still centered on the middle term, but instead of being concerned with the conclusion as a proposition, the philosopher engages with the meaning of the three terms, emphasizing that their permutation leads to semantic enrichment. It is certainly in the latter sense that Hegel claimed that “everything rational is a syllogism” (90; 588). From a formal point of view, his method of syllogistic reasoning may appear unsatisfactory because he does not separate the logical form from material content. Furthermore it is not completely clear how Hegel himself arrives at the semantic determinations of his categories. Consequently, the *Science of Logic* is not an *organon*: it does not supply the reader with a toolkit of dialectical reasoning that could be schematically applied for deducing new concepts. For this reason, Hegel himself—in contrast to many of his followers and most of his critics—never considered the syllogistic presentation of his own system as concluded.

Notes

- 1 For convenience, I will use the capital when referring to the Hegelian speculative concept, and the lowercase when referring to concepts in the ordinary sense.
- 2 All parenthetical references in the text are to Hegel’s *Logic*. The *Science of Logic* is cited according to the pagination of the critical edition (Georg Wilhelm Friedrich Hegel, *Wissenschaft der Logik; Zweiter Band: Die subjektive Logik*, Hamburg, 1981), followed by the page number of the di Giovanni translation (Cambridge, 2010). The

Encyclopedia Logic is referred to by paragraph numbers, followed by the page number of the Brinkmann/Dahlstrom translation (Cambridge, 2010).

- 3 On the speculative function of Hegel's doctrine of syllogism see also Wolfgang Krohn, *Die formale Logik in Hegels "Wissenschaft der Logik." Untersuchungen zur Schlusslehre* (München, 1972), 7–13.
- 4 For grammatical reasons the order is inverse to Aristotle's formulas since the Stagyrite writes "B belongs to every A" instead of "all As are B"
- 5 In "some philosophers are Kantians" the extension of the subject term is larger than the extension of the predicate term, whereas in "some philosophers are Germans" it is presumably not.
- 6 The German verb "zusammenschließen" has the same root as the noun "Schluss" (syllogism or inference).
- 7 Georg Wilhelm Friedrich Hegel, *Nürnberger Gymnasialkurse und Gymnasialreden* (Hamburg, 2006), 272; *The Philosophical Propaedeutic* (Oxford, 1986), 113.
- 8 See Aristotle, *Analytica Posteriora*, I 6.
- 9 Ernst Platner, *Philosophische Aphorismen* (Leipzig, 1793), 258 f.
- 10 Since not the sequence of the extremes, but only the middle term is considered, there are not $3! = 6$ combinations, but only 3.
- 11 Consider for instance: "All humans are mortal. Some humans are philosophers. Therefore some philosophers are mortal" (mood Datisi), or: "No quadruped is human. All philosophers are human. Therefore no philosopher is a quadruped" (mood Camestres). It should be noted here that Hegel's second figure corresponds to Aristotle's third figure and the other way round. For more details see Georg Sans, *Die Realisierung des Begriffs. Eine Untersuchung zu Hegels Schlusslehre* (Berlin, 2004), 110–118.
- 12 On Hegel's dialectical method see Hans Friedrich Fulda, "Hegels Dialektik als Begriffsbewegung und Darstellungsweise," in *Seminar: Dialektik in der Philosophie Hegels* ed. Rolf Peter Horstmann (Frankfurt, 1978), 124–174.
- 13 The editor of the English translation (note 95) refers to a similar example in Antonio Genovesi's *Elementa artis logico-criticæ* (Venice, 1749). The third part of Kant's *Universal Natural History and Theory of the Heavens* (Königsberg, 1755) contains "an attempt to compare the inhabitants of the different planets on the basis of the analogies of nature" (Immanuel Kant, *Natural Science*, Cambridge, 2012, 294).
- 14 On this issue see, for example, Immanuel Kant, *Lectures on Logic* (Cambridge, 1992), 623.
- 15 On the following interpretation see Klaus Düsing, "Syllogistik und Dialektik in Hegels spekulativer Logik," in *Hegels Wissenschaft der Logik. Formation und Rekonstruktion*, ed. Dieter Henrich (Stuttgart, 1986), 15–38, 29 ff. as well as Sans, *Die Realisierung des Begriffs*, 201–222.

- 16 Although the mapping between the three kinds of celestial bodies and the moments of the concept is rather opaque, it may be conjectured that the absolute center is meant to represent universality, the non-self-sufficient objects particularity and the relative individual centers singularity. In this case the first syllogism corresponds to the figure S–U–P, the second to P–S–U, and the third to S–P–U. The order is apparently reverse with respect to the presentation of the three figures in the doctrine of syllogism. In § 198 of the *Encyclopedia Logic*, Hegel gives a schematic account of the triad which sticks more closely to the order of the figures in the syllogism chapter.—On the meaning of the three moments see also Nicolas Février, “Das syllogistische Bild des Sonnensystems in der absoluten Mechanik Hegels (1830),” in *Jahrbuch für Hegelforschung* 4–5 (1998–99): 143–170, 161–166, and *La mécanique hegelienne. Commentaire des paragraphes 245 à 271 de l'Encyclopédie de Hegel* (Louvain-La-Neuve-Paris, 2000), 113–119.
- 17 It should be noted that in § 198 of the *Encyclopedia Logic*, the meaning of the moments of particularity and singularity is inverted.
- 18 For an in-depth interpretation of these three tenets see Dieter Henrich, “Logische Form und reale Totalität. Über die Begriffsform von Hegels eigentlichem Staatsbegriff,” in *Hegels Philosophie des Rechts. Die Theorie der Rechtsformen und ihre Logik*, eds. Dieter Henrich, Rolf-Peter Horstmann (Stuttgart, 1982), 428–450; “Logical Form and Real Totality: The Authentic Conceptual Form of Hegel’s Concept of the State,” in *Hegel on Ethics and Politics*, eds. Robert B. Pippin; Otfried Höffe (Cambridge, 2004), 241–267. A more recent study is Nathan Ross, *On Mechanism in Hegel’s Social and Political Philosophy* (New York; London, 2008), 103–124.
- 19 For a syllogistic analysis of chemical processes see Georg Sans, “Weisen der Welterschließung. Zur Rolle des Chemismus in Hegels subjektiver Logik,” in *Hegel-Studien* 48 (2015), 37–63.
- 20 On the function of syllogism in teleological reasoning see Tommaso Pierini, *Theorie der Freiheit. Der Begriff des Zwecks in Hegels Wissenschaft der Logik* (München; Paderborn, 2006), 152–205.
- 21 Georg Wilhelm Friedrich Hegel, *Philosophy of Nature* (London, 1970), vol. I, 261.
- 22 Hegel, *Philosophy of Nature*, vol. II, 216.
- 23 Hegel, *Philosophy of Nature*, vol. III, 107.
- 24 The syllogistic structure of Hegel’s *Elements of the Philosophy of Right* is highlighted by Klaus Vieweg, *Das Denken der Freiheit. Hegels Grundlinien der Philosophie des Rechts* (München, 2012), esp. 366–433. See my review in *Hegel-Studien* 47 (2013), 227–231.
- 25 Georg Wilhelm Friedrich Hegel, *Philosophy of Mind* (Oxford, 2007), 265.
- 26 See Georg Sans, “Hegels Begriff der Offenbarung als Schluss von drei Schlüssen,” in *L’assoluto e il divino. La teologia cristiana di Hegel*, eds. Tommaso Pierini et al. (Pisa-Roma, 2011), 167–181.

27 Hegel, *Philosophy of Mind*, 276.

28 *Ibid.*

29 The systematic meaning of the three final syllogisms is still contentious among Hegel scholars. The classic treatment is Hans Friedrich Fulda, *Das Problem einer Einleitung in Hegels Wissenschaft der Logik* (Frankfurt, 1965), 284–301. Recent interpretations include Stefano Fuselli, *Forme del sillogismo e modelli di razionalità in Hegel* (Trento, 2000), 206–230, Nicolas Füzési, *Hegels drei Schlüsse* (Freiburg-München, 2004), and Angelica Nuzzo, “Hegels Auffassung der Philosophie als System und die drei Schlüsse der Enzyklopädie,” in *Hegels enzyklopädisches System der Philosophie*, eds. Hans-Christian Lucas; Burkhard Tuschling; Ulrich Vogel (Stuttgart-Bad Cannstatt, 2004), 459–480.