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FACULTATIVE LOGIC

THE OPERATIONS OF THE MIND

Facultative logic has been defined as the science of “the principles of the habituated regulation of the mind in the apprehension of truth and the acquisition of knowledge and properly grounded opinion.”¹ Although divided on the question of identifying its origin, scholars generally agree that it is a new early-modern conception of logic. Its rise, for James Buickerood, may be traced to the publication of John Locke’s *Essay Concerning Human Understanding* (1689), in which the ideas were the result, the product of the operations of the human cognitive faculties of perception, imagination, memory, and judgment in their relation to the world.² This opinion is supported also by Paul Schuurman, who nevertheless stresses the importance of Malebranche as the first philosopher to build a new logic around human cognitive faculties,³ and René Descartes, who provided the basis and first principles, but left it to his followers to apply his new insights in the field of facultative logic.⁴ Instead, Sylvain Auroux and Frederick S. Michael trace the birth of facultative logic back to the *Logique de Port-Royal* (1662).⁵ Logic, according to Antoine Arnauld and Pierre Nicole, consists in the “reflections of men on the four operations of mind, conceiving, judging, reasoning and ordering.”⁶ Facultative logic thus concerns the operations of mind, serving to rightly conduct human reason to the knowledge of things. A closer

view, however, shows that this conception comes from Bartholomeus Keckermann's *Systema Logicae* (1601), where logic is defined as the "art of directing mind in the cognition of things," in particular, in "understanding, knowing, and thinking,"⁷ which in turn is derived from Renaissance Aristotelians, in particular from Jacopo Zabarella's logical writings. For this reason, in this chapter I propose to contextualize the origin of facultative logic within the Aristotelian tradition. The subjects of facultative logic are concepts rather than terms, judgments rather than propositions, reasonings rather than syllogisms.⁸ It emerged from the combination of psychology and logic at the end of the sixteenth century, departing from Scholastic syllogistic.⁹

In this sense, facultative logic differs from both "epistemic logic" and the "logic of ideas." "Epistemic logic" does not cover the psychological dimension of the problem of knowledge, rather it "has to do with necessary and sufficient conditions of knowing and with the inferential relations involving epistemic and other propositional-attitude statements."¹⁰ The "logic of ideas," on the other hand, concerns the various possible combinations among the manifold mental contents, rather than the certainty and the truth of the discourse, as epistemic logic does.¹¹ Instead, facultative logic is concerned with the origin and the logical use of the natural powers of the mind in knowing an object. It was born from the discussions on the theory of habits, especially the habit of understanding, which became the main faculty of the human mind for knowledge, namely, that which differentiates human beings from animals.¹² In particular, I support the provocative thesis that the real Copernican revolution in the field of epistemology was possible only from a reconsideration of Aristotelian logic in early modernity with a new understanding of the dialectic between the knowing subject and the known object. In this chapter, I would like to suggest the impact of this revolution on Kant's logic.

There was no genuine facultative logic in Ancient Greece because, to start with, there was no corresponding concept to that of "faculty." The term most widely used to define it, *δύναμις*, denoted in a most meaningful way a force more than a capacity, for which at least an "intentional" activity of the subject is necessary.

In *Republic* IV, 440E, Plato deals with three parts of the soul: (1) the rational part, which thinks and suppresses the instincts; (2) the irrational or concupiscible part, which rules the impulses and needs;

and (3) the irascible part. Thereafter, in the fifth book, Plato outlines a distinction between two different cognitive powers or forces and their objects,¹³ ἐπιστήμη and δόξα, “by which human beings are able to do what they are able to do.”¹⁴ Plato uses the term δύναμις to denote these kinds of cognitive faculties, but he often uses the cognitive verbs γινώσκω and νοέω in its place. Clearly Plato does not use terminology in a careful and technical way, but sometimes “he uses more than one term to refer to the same element in the theory, or the same term to refer to different elements in the theory.”¹⁵

In Aristotle, things change quite drastically. First of all, Aristotle does not deal with parts, but with functions of the soul: vegetative, sensible, rational, and locomotive. All these functions have in themselves a characteristic force thanks to which the human being can grow, sense, think, and move. Only the rational part of the soul, however, is properly called “faculty.” Aristotle in fact states that “to think depends on the subject, when it wants to exercise his knowledge, but sensation does not depend upon itself because a sensible object must be there.”¹⁶ Imagination itself, which mediates knowledge between sensation and understanding, is a force, not a faculty. On the one hand, Aristotle states, imagination “is not of the same kind of thought of apprehension,”¹⁷ because it does not depend totally on the subject but on the affection of the sensation; on the other hand, however, it seems to involve active thought.¹⁸ Imagination is properly a force or disposition in virtue of which human beings discern and judge whether something is erroneous or not, and is not of the kind of sense, opinion, science, intelligence.¹⁹ Imagination cannot be sensation, because sensation is in all animals, whereas imagination is not. It is neither science nor intelligence, because these are always true, while imagination can be false. Imagination cannot be opinion because it is in some animal, while opinion is not. It must be a force, that is “a movement resulting from an actual exercise of a power of senses.”²⁰

If facultative logic in Aristotle was not primarily concerned with either sensation nor imagination, it would deal with the understanding. In *On the Soul*, however, Aristotle describes physiologically how the sensible object becomes intelligible, and he outlines only a few epistemological reflections. Kant himself defines Aristotle’s attempt as a kind of physiology, which is akin to Locke’s standpoint, as we will see later in this chapter (17: 554).

The only place in the entire Aristotelian corpus where an attempt at drafting a facultative logic is made is the thirty-nine lines in *Posterior Analytics*, II.19.²¹ Aristotle states that there “exists a discriminative innate force in all animals that is sensation.”²² Sensibles then, Aristotle adds, in some animals, rest in the mind. If sensibles do not rest in the mind for these animals, there is no other knowledge than the sensible one. In other animals, the sensible object rests in the mind, and after various sensations a kind of conceptualization is possible. From this kind of sensation originates memory and, subsequently, experience. From experience a general concept (καθόλου) is formed that rests in the mind. In this way, it is possible to acquire the disposition for scientific knowledge. The mental process, which infers from the various particulars to what is the same in all of them, is a kind of induction (ἐπαγωγή). The mental process of assent to the product of this induction is called intellection (νοεῖν). The process of acquiring general concepts and principles is therefore twofold: on the one hand, we have the formation of knowledge, which relies on experience and is mainly discursive; then, on the other hand, we have the actual cognition, which is a kind of an intuitive act of grasping what is given and generated by experience. The inductive process is necessary for the cognition of immediate and first principles, from which every scientific demonstration begins, and which is at the outset qualitatively different from the cognition after the conclusions of the demonstration. This marks a passage from a general indeterminate concept to a determinate universal concept. In fact, the formation and intellection of general concepts and principles produces only temporary knowledge, which must be proven discursively by means of demonstration to make of it scientific knowledge.

Aristotle’s “facultative logic” plays with the discriminative force of sensation and with memory, on the one hand, and on the other hand, with understanding, so as to determine how sensible knowledge could become universal and epistemic. Aristotle’s brief outline of facultative logic was almost the only example in the Aristotelian tradition until the Renaissance on which the Greek commentators first, and then the medieval thinkers, based their investigations. The question of the *intellectus adeptus, acquisitus, and speculativus*, for example, first outlined by Alexander of Aphrodisias and then fully developed by Averroes, is a development of Aristotle’s theory of the understanding.²³

In Germany, the problem of facultative logic in the Renaissance reemerges with Philipp Melanchthon and his *Liber de anima*. Melanchthon writes that the mind is usually credited with three operations: (1) simple apprehension; (2) composition and division; and (3) discourse.²⁴ They correspond, within the Aristotelian canon, to (1) induction (simple term); (2) synthesis and analysis (proposition); and (3) reasoning (syllogism). Melanchthon then specifies in detail all the operations of the mind. They are simple cognition, enumeration, composition and division, reasoning (complex logical inferences), memory, and judgment.²⁵

Melanchthon's legacy in German Scholastic philosophy is long lasting and is even very vivid in Kant's *Critique of Pure Reason* and logic lectures, so much so, in fact, that Brandt writes: Kant "will employ the concept of consciousness in his long-standing search for the proper form of logic. However, in the edition of 1781, Kant no longer speaks of consciousness, but rather of the Aristotelian tradition's *operationes mentis*."²⁶ Indeed, on closer examination, Kant's transcendental logic is modeled on the three operations of the mind. Transcendental logic, however, finds its parallel in general logic, therefore, "general logic is constructed on a plan that corresponds quite precisely with the division of the higher faculties of cognition. These are: **understanding, the power of judgment, and reason**. In its analytic that doctrine accordingly deals with **concepts, judgments, and inferences**, corresponding exactly to the functions and the order of those powers of the mind, which are comprehended under the broad designation of understanding in general."²⁷ Traces of Melanchthon's conception are scattered throughout the Kantian corpus. Again, in the *Critique of Pure Reason*, Kant establishes that the form, abstracting from the content (or matter) of cognition, has no other task than that "of analytically dividing the mere form of cognition into concepts, judgments, and inferences, and thereby achieving formal rules for all use of the understanding" (A 132–33/B 171–72). In *The Vienna Logic*, Kant asks himself: "how many operations of the mind are there? Response. Three. Simple apprehension, judgment, and inference" (24: 904). From *The Busolt Logic* we know that "logic has to do with the understanding: the *operationes mentis* were already divided by the ancients, that is: *apprehensio simplex* or *conceptus, iudicium et ratiocinium*" (24: 653). Kant clearly has the Aristotelian tradition in mind: "one should deal with the three operations

of thought before inferences. This was the way strictly followed by Aristotle. Wolff left it" (24: 763).²⁸ Kant could read Melanchthon directly, however, his nearest available source being Martin Knutzen's logic, which clearly establishes that: "there are only three fundamental operations of the mind or of understanding. The first one is simple apprehension, the second one is judgment and the third is reasoning."²⁹ However, as we will see, Kant could read this partition in many other eighteenth-century logicians such as Baumgarten, Crusius, and Reimarus. Nonetheless the fact that he recognizes that his classification belongs to Aristotle allows us to surmise that his reference was the Königsberg Aristotelians.

On the tripartition of the cognitive faculties of Melanchthonian derivation Kant founded his attempt to build up a logic as science that could identify the laws of the mind in an exhaustive system.³⁰ Thus, in Kant, the system of the forms of logic is nothing other than a reflection of the natural system of the forms of thought, which is for him immediately evident, rendering superfluous any further attempt at analysis and foundation.³¹ Kant defends this thesis in *The Blomberg Logic*, where he aims not only to found logic on the natural operations of the mind, but also his philosophical system on mental processes (24: 31), as we may see also from the above mentioned passage from the *Critique of Pure Reason* (A 130/B 169).

His attempt to build up an entire philosophical system on cognitive faculties also in the critical period is manifest in "Introduction" to the *Critique of the Power of Judgment*, where Kant structures his philosophy according to the three inferences of the mind: concept, judgment, and syllogism.³² Reinhard Brandt maintains that facultative logic is pivotal to understanding Kant's transcendental logic, indeed the three operations of the mind are recognizable in the table of judgments and constitute its deduction: "the triad of quantity, quality, and relation refers to the *tres operationes* of the understanding: the doctrines of concepts, judgments, and inferences, to which the doctrine of method is added as a fourth member."³³ Erich Adickes also suggests that "Kant's enterprise was an investigation on human cognitive faculties [. . .] a logic of the research of cognitive activities."³⁴ This perspective, however, seems to suggest an identification between natural logic, namely, the logic of inborn faculties of the mind, and formal logic, which one can question.³⁵ In this chapter, we shall see that general or formal logic does not coincide with

natural logic, but the former is *based on* a particular kind of natural logic that Kant calls physiology of the mind, whose main theoretical reference is Locke, and which has to do with the origin of the logical elements, not with their use. Kant divides the origin and use of logical elements, and in this way can separate natural logic from both general and transcendental logic.

GNOSTOLOGY AND NOOLOGY

Besides Melanchthon, the Paduan Jacopo Zabarella was the Aristotelian logician who made the most important contribution to the rise of facultative logic. His writings on the cognitive powers of the mind such as *De sensu agente*, *De mente humana*, *De specibus intelligibilibus*, and *De ordine intelligendi* were very popular in Germany. Probably the most significant book in developing this new logic is the *Liber de tribus praecognitis*. This book deals with the conditions of the mind in acquiring scientific knowledge as exposed by Aristotle in *Posterior Analytics*. According to Zabarella, the object of speculative science is twofold. The first part, the material one, is the *res considerata*, while the second part, the formal one, is the *modus considerandi*. Since in the Aristotelian framework science deals only with necessary things, while matter is always contingent and accidental, science is concerned only with the form, that is the *modus considerandi*, which is a priori to the object of knowledge (*res considerata*) and makes it knowable, whatever it is.³⁶ The investigation of the science is therefore for Zabarella an inquiry into the condition of possibility of cognition in relation to a possible object in general. The conditions of possibility of a cognition are what Zabarella calls precognitions (*praecognita*). Since the speculative science is preceded by precognition, to investigate the condition of possibility of cognition of an object means simply to investigate this kind of precognition. But again, precognition, on which the speculative science is based, cannot be accidental, otherwise scientific knowledge would ultimately be accidental too. Precognition must be grounded in first, true, and immediate principles, in other words logical principles that make cognition possible. Investigating the condition of possibility of a cognition in general means, therefore, to investigate the first principles of sciences.

There are various first principles that are not demonstrable but are used in demonstrations, like syllogisms.³⁷ In relation to precognition, first principles are of two kinds: (1) supposition or hypotheses, if they deal with the “that is”; and (2) definitions, if they deal with the “what is.”³⁸ Principles can be either *principia cognoscendi* or *principia essendi*. *Principia cognoscendi* are those propositions that are not cognizable in themselves, and are hypotheses insofar as they are special requirements of scientific argumentation.³⁹ *Principia essendi*, on the other hand, are not propositions, but rather principles that are unknown at the beginning and the object of the discovery.⁴⁰ In the history of facultative logic, *principia cognoscendi* play a key role at the start of the seventeenth century, characterizing the subjectivity of the mind in cognition.

The early reception of Zabarella’s *Liber de tribus praecognitis* is evident in Johann Heinrich Alsted’s *Philosophia digne restituta: Libros quatuor praecognitorum philosophicorum complectens* (1612), which is divided into four books titled respectively, *Archeologia*, *Hexiologia*, *Technologia*, and *Canonica*.⁴¹ In particular, the second book, which is devoted to *Hexiologia*, that is, the doctrine of intellectual habits, makes use of Zabarella’s ideas. The problem of precognitions and principles in Alsted relates directly to the habit of understanding. Understanding is, Alsted states, “contemplative habit by means of which we are inclined to assent firmly and evidently to first principles.”⁴² In particular, Alsted recognizes two kinds of understanding, natural or acquired. Natural understanding concerns the immediate grasping of the first, common, evident, and immediate propositions, concepts, and principles. It is characterized by the act of intellection, which knows directly and intuitively intelligible species; while acquired understanding, which is the real habit, concerns a kind of second nature that the mind attained through experience, and has to do with the formation of universals, or general principles, rather than their cognition. The process described by Aristotle in *Posterior Analytics*, II.19, is therefore twofold for early-modern Aristotelians, and encompasses both the formation and grasping of universal concepts and principles. But Alsted’s originality in the history of logic, unlike Zabarella and many other contemporary Aristotelians, is his awareness of the autonomy of the science of cognitive faculties and his invention of a new science such as *hexiologia*.

In the wake of Zabarella and Alsted's ideas, in the Lutheran regions the development of facultative logic is connected with the elaboration of the doctrine of the habits and with the foundation of two new disciplines: gnostology and noology. In the gnostological tradition, the first important work is Georg Gutke's, *Habitus primorum principiorum seu Intelligentia* (1625),⁴³ which is a single treatment of Alsted's *Hexiologia* devoted only to "understanding," and a reelaboration of Zabarellean logic. After Gutke, in 1631, Valentin Fromme published his *Gnostologia*,⁴⁴ which exercised a powerful influence in Northern Germany, especially on Abraham Calov.⁴⁵ It is a remarkable fact that gnostological doctrines were particularly widespread, as we have seen in the previous chapters, at Königsberg University. The early reception of gnostology in Königsberg was due to Lorenz Weger, who dealt with facultative logic in his courses in the faculty of philosophy. His lectures were collected in 1630 into the volume *Prima mentis operatio*, in which he focuses in particular on the operation of apprehension, which is in his eyes the process of formation of universal concepts and principles, rather than intellection itself.⁴⁶

However, Abraham Calov was the first to elaborate an organic system of metaphysical sciences introducing disciplines in order to investigate the understanding as the habit of principles. The sciences of the habit of principles have as subject not only the principles themselves, but also the simple terms, which are known by experience. These two sciences are *gnostologia* and *noologia*.⁴⁷

In Calov's words, gnostology is the science that concerns the mental habit that has to do with the cognizable qua cognizable,⁴⁸ in other words the science that has to do with the mode of knowing of an object in general. The object of gnostology is the cognizable (*cognoscibile*), and deals with the mind as habit in its manner of improving knowledge according to its natural powers.⁴⁹ Calov states that the cognizable differs from the intelligible, which is "all that is," and encompasses both the somewhat (*aliquid*) and the nothing (*nihil*).⁵⁰ The cognizable has instead always a representational ground; it has objective reality,⁵¹ while the intelligible does not: "the object is a real concept . . . an intelligible (*noema*) is in a broader sense an object, since every object that is is an intelligible, but not every intelligible is an object. In fact, all that can be understood by the understanding

is an intelligible, but to the object is still required another relation (*relatio*).⁵² For the intelligible to be cognizable it must have a relation with something else, which for Calov is a relation with an object of experience, that is, with a representation in the mind, just as for Kant the mere possible to be actual and real must be experienced. Gnostology for Calov thus becomes the science that establishes first of all the origin of knowledge and the difference between sensible and intelligible cognition, between what has a representational ground and what does not, between αἰσθητός and νοηματικός. Hence Calov sketches the distinction between what is cognizable, that is, representable, and what is thinkable, which is similar to the way Kant outlines the distinction between knowing and thinking in the *Critique of Pure Reason* (B 146). What is contradictory, according to Calov, is nonbeing, which is not, however, a pure nothing. It is in the realm of thought and intelligibility, but not in the realm of the cognizable. In this way, being coincides with the cognizable and the various transcendental of being must refer to being as a cognizable.⁵³ Concerning the cognizable, quoting Zabarella, Calov says that it “contains two parts: (1) the thing considered, or the material part; (2) the mode of considering, or the formal part.”⁵⁴ The cognizable can be considered materially, if it concerns the being of the object itself, or formally, if it concerns the way through which it is considered in the mind. In the former case, the cognizable characterizes the objective relation to the mind (*relatio*), and in a broader sense the content of the concept of the object. In the latter case, it is what specifies the very general abstractions and makes of the being the real “first cognizable” (*primum cognitum*).⁵⁵ The being as first cognizable is not a mere concept abstracted from matter, in fact, as we have seen: it always requires a representational ground, what is called an objective reality, that is an object (*objectum*) in front of the subject (*subjectum*). In this new conceptual framework, all the transcendental affections traditionally associated with the being are referred to a cognizable, to an object of cognition in general, and this is the radical novelty introduced by Calov in ontology, one that would allow the shift of the notion of “transcendental” from metaphysics to logic.⁵⁶ According to Calov, the affections of being are very general concepts that define the transcendental being (*ens transcendental*).⁵⁷ Affections can be either united or disjunctive.⁵⁸ Of the first group we can posit perfection (*perfectio*), unity (*unitas*), truth (*veritas*), and goodness (*bonitas*), but also time

(*duratio*) and space (*ubietas*), which have no relative opposites. Disjunctive transcendentals are determined by oppositions, for instance “necessary-contingent,” “cause-effect,” “permanent-succeeding,” and many others. It is worth noting that from the Kantian standpoint, space and time are also transcendental forms without relative opposites, while categories are characterized by their disjunctivity, which is overcome only in the third category of each group. There is therefore a striking resemblance between Calov’s conception of transcendentals and Kant’s transcendental forms. Kant’s table of categories itself seems to be modeled on the Scholastic list of disjunctive transcendentals of being, something that has never been noticed by the scholarship in spite of the numerous researches on the topic.

But what is remarkable in Calov is that *transcendental* does not designate a mere being, but a cognizable, therefore the transcendental characterizes all essential attributes without which the cognizable would not be the object of cognition. It is but a short step to Kant. While Calov’s transcendentals are attributes of an objective reality, of a thing, even if represented in the mind, Kant’s transcendental forms are attributes of the mind for cognizing objects. However, it is still true for Calov that a cognizable is always a cognizable for a mind, and even if transcendentals do not pertain directly to knower, rather to the known object, they always concern that formal part of the cognizable: the mode of considering of the mind, which is called, as we shall see in the next chapter, “pure function of the mind.” In no way are transcendentals “supernatural things,” as Tonelli suggested, confusing them with the transcendentals. We must keep in mind that, for Calov, transcendental attributes did not denote a mere being, but a cognizable, that is the transcendental attributes without which the cognizable would not be the object of knowledge. It is evident that this formulation is extremely close to the Kantian perspective and, importantly, creates a shift in transcendental philosophy from the old metaphysics to the new transcendental logic.

Calov’s identification of the cognizable and its exclusion of the intelligible object in the nonbeing (*non-ens*) from the field of gnostology and ontology is polemical against the Calvinist Clemens Timpler. Timpler established that ontology dealt with “all that is intelligible as it is understandable but by the light of human natural reason.”⁵⁹ Calov’s critique of Timpler is analogous to Kant’s criticism against Christian Wolff in the “Remark to the Amphiboly”:⁶⁰

The highest concept with which one is accustomed to begin a transcendental philosophy is usually the division between the possible and the impossible. But since every division presupposes a concept that is to be divided, a still higher one must be given, and this is the concept of an object in general (taken problematically, leaving undecided whether it is something or nothing). (A 290/B 346)

Kant attacks the Wolffian division of possible and impossible,⁶¹ going back to the original concept of an “object in general,” which in Calov’s mind corresponds to the concept of being in general, before establishing whether it is a cognizable, or a mere intelligible. Kant’s table of nothing seems modeled on Calov’s ideas. The first kind of nothing of the Kantian table appears to be equivalent to Calov’s non-being (*non-ens*) as intelligible. In fact, Kant writes that the concept to which no intuition can be given and is without a representational ground is nothing. It is a concept without object like the *noumena*; this is similar to the way Calov defines intelligibles. This explains why for both Calov and Kant it is not possible to have a science of the intelligibles, because in some sense they are nothing. Ontology is grounded for both authors on a real being, which always has a representational ground. For both Calov and Kant, the intelligible object can be, without a representational ground, of the same kind of nothing as the being of reason (*ens rationis*), even if the two are not the same. Furthermore, both Calov and Kant deny the possibility of having a science of the intelligible object, because its knowledge goes beyond the human faculties and pertains only to God: Calov says, “it is rash to know natural things beyond nature”⁶² for the same reason endorsed by Kant, that is, that speculative reason cannot “make any progress in the sphere of the supersensible” (B XX–XXI).

On the other hand, noology does not deal with the cognizable, but with the mental habit from the use of which the mind acquires the first principles of knowledge (*principia cognoscendi*).⁶³ Calov mentions his two direct sources: (1) Gutke’s *Intelligentia sive habitus primorum principiorum*, and (2) Alsted’s *Archeologia*. Calov invokes also Melanchthon’s distinction of the three operations of the mind: (1) simple apprehension; (2) composition and division; and (3) discourse. Simple apprehension is studied by gnostology and concerns the way through which we know sensible and intelligible objects.

Noology studies the second operation of the mind, which consists in the union of a predicate with a subject by means of a copula in order to formulate propositions. From these propositions issue principles and axioms, which are the proper object of noology. The *prima principia cognoscendi* are “the most common and known axioms, from which every our cognition, which from nature we can have, depends.”⁶⁴ For this reason *prima principia cognoscendi* are the grounds of the book of nature (*liber naturae*), as we can read it. *Principia cognoscendi* are not principles and grounds of nature itself, but they are heuristic and explanatory devices to understand and know the world. Calov states that the book of nature differs from Scripture because reason and divine revelation are different. Consequently, we can have for Calov either supernatural (*supernaturalia*) or natural (*naturalia*) principles. Natural principles are in general definitions, hypotheses, and postulates.⁶⁵ There are two fundamental natural principles of noology. The first is the law of contradiction: “it is impossible for the same thing at the same time to be and not be”; the second, derived from the first, establishes that “at the same time it is impossible for the same thing to be and to be confused with the other things.”⁶⁶ The second principle is a draft of the law of identity, because it deduces from the being of a thing its essence and therefore its impossibility to be confused with another object. A human—Calov exemplifies—is a rational animal, but if we do not consider its “being,” that is what makes it what it is, that is its essence, or its specific difference, it will be confused with other beasts. In other words, a being because of its particular mode of being cannot be confused with another being, since the mode of being is proper to every being.⁶⁷

In Königsberg, gnostology and noology were further developed by Eifler, who elaborates a precise distinction between general noology and special noology, which is only barely mentioned by Calov.⁶⁸ Regarding this distinction, Eifler defended two disputes titled *Noologiam generalem succincte proponens* and *Noologiam specialem succincte complectens*, later published in 1639 in the *Collegii philosophici*: the former deals with general principles of all sciences, while the latter with principles pertaining to particular sciences. In 1636, Eifler also directed Georg Nöbe’s *De functionibus intellectus humani rectificandis ac dirigendis a logica*, in which the author suggested a criticism of the cognitive faculties for a correct use of the reason in

the argumentations.⁶⁹ On this topic, Eifler also published his *Habitus intelligentiae disputatio* (1651) and his *Gnostica* (1653).

Calov's ideas also were followed by Georg Meier, who published his *Gnostologia* in 1662, and by Georg Wagner, who published his *Disputatio gnostologica* in 1670. In the faculty of theology too, Melchior Zeidler was interested in studying noology, and he published his *De noologia* in 1662 to establish it as an autonomous discipline.⁷⁰ Noology rapidly became the science of the principles of thought, a propaedeutic discipline necessary for any advancement in metaphysics.

The impact of gnostology and noology is not immediately evident in Kant, even if we can find some traces in his precritical works. In particular, in *Reflection 4163* (1769–1770), Kant uses the concept of “noology” to characterize the part of logic that is propaedeutic to metaphysics:

All sciences of pure reason are either those that consider the rules of universal cognition in general through pure reason or the particular rules of pure reason themselves. *Logica. Phaenomenologia generalis, Noologia generalis* have as their end merely the rules of universal and non-empirical cognitions that are not given through any experience. Noology applied to that which is given through experience, although not through grounds of experience, is theoretical: metaphysical; or practical: morality. (17: 440)

This *Reflection* is evidence of Kant's acknowledgment of the continuity of his transcendental philosophy as propaedeutic to metaphysics with the Königsberg Aristotelian tradition of gnostology and noology. In fact, in this fragment, Kant conceives of general noology as the science that has to do with universal laws of cognition prior to any knowledge, exactly as the Königsberg Aristotelians did, and applied noology as the science of the principles of cognition of particular disciplines. Noology can therefore be theoretical or practical.⁷¹ This distinction, as we have just recognized, comes from the Königsberg noological tradition, in particular from Eifler. The *Reflection* may be dated to around 1769–1770, during the period when Kant was conceiving his last Latin metaphysical work, his *Inaugural Dissertation On the Form and Principles of the Sensible and the Intelligible World*.

The main topic of this work was inspired by his attempt to solve the open questions of his *Dreams of a Spirit-Seer Elucidated by Dreams of Metaphysics*, that is the connection between the sensible and intelligible world. In particular, Kant's aim was to determine whether the subjective forms of cognition were the same for the sensible and intelligible world, and if both worlds were grounded in the same principles. In doing so, Kant was forced to define the objects of sensible and intelligible knowledge, and the subjective modes of investigation. In Kantian terms, it is necessary to determine the matter and the form of knowledge. In this sense, the subject of the *Inaugural Dissertation* is the cognizable (*cognoscibile qua tale*) and the mode of conceiving (*modus considerandi*) objects. Kant seems to merge the noological part of the first principles of metaphysics with the gnostological part, as we read in § 8:

. . . the philosophy which contains the first principles of the use of the pure understanding is metaphysics. But its propaedeutic science is that science which teaches the distinction between sensitive cognition and the cognition which derives from the understanding; it is of this science that I am offering a specimen in my present dissertation. Since, then empirical principles are not found in metaphysics, the concepts met with in metaphysics are not to be sought in the senses but in the very nature of the pure understanding, and that not as innate concepts but as concepts abstracted from the laws inherent in the mind (by attending to its action on the occasion of an experience), and therefore as acquired concepts. To this genus belong possibility, existence, necessity, substance, cause etc., together with their opposites or correlates. Such concepts never enter into any sensory representations as parts, and thus they could not be abstracted from such a representation in any way at all. (2: 395)

This passage is crucial to understanding Kant's transcendental philosophy as a transformation of the Königsberg Aristotelian tradition of gnostology and noology. It is clear for Kant that the philosophy of the first principles of pure understanding is metaphysics, or at least a part of it. As we have seen, in *Reflection 4163*, philosophy that deals with the first principles of metaphysics is noology, which

in the Königsberg Aristotelian tradition was a part of metaphysics, namely, the introductory part that established the foundations of metaphysical thinking. In *What Real Progress Has Metaphysics Made in Germany Since the Time of Leibniz and Wolff?* Kant characterizes the science of the concepts and principles of the understanding as ontology (20: 260). Kant specifies that ontology is only a part of metaphysics and pertains to it only in a propaedeutic function, as a hallway or vestibule of metaphysics itself. It is a part of transcendental philosophy because it contains the conditions and the first elements of every a priori knowledge. Ontology is “a resolution of knowledge into the concepts that lie a priori in the understanding, and have their use in experience” (20: 260), namely what Kant calls “analytic” in the *Critique of Pure Reason*. Kant adds that there has not been much progress in the field of ontology since the days of Aristotle (20: 260), and in my opinion this statement shows that Kant had in mind the Königsberg Aristotelian tradition rather than Wolffian metaphysics, otherwise there would have been some advancement in this discipline. Kant’s variegated terminology in defining these sciences in these years of troubled attempts reflects the multiplicity and ambiguity of the Königsberg Aristotelian tradition. Indeed, “the philosophy which contains the first principles of the use of the pure understanding” (2: 395) or “the rules of universal cognitions that are not given through any experience” (17: 440), as Kant would say, is noology, and was considered by Königsberg Aristotelians like Calov as a part of ontology, as an introduction to metaphysics.⁷²

In the *Inaugural Dissertation*, Kant pushes his argument further, pointing out that the subject-matter of metaphysics is not something that comes from experience, it is not an object, rather it pertains to pure understanding in its modes of knowing. Understanding knows by means of the forms that are modes of knowing (*modi cognoscendi*) objects. These forms, these *modi cognoscendi*, are not innate (*con-nati*) to the mind, rather they are acquired (*acquisiti*). And this, as we shall discuss in detail in the following pages, corresponds perfectly to gnostological elaborations, according to which the ways of grasping all possible objects (*modi apprehendendi quodcunque objectum*) constitute a mental habit (*habitus mentis*)—that is, they are acquired. A decade later, in the lectures on the philosophical encyclopedia, as well as in those on metaphysics, Kant returns to the topic stating that Plato was convinced that in the human mind there were traces

of innate ideas, while Aristotle would teach the contrary. According to Kant, Locke followed Aristotle in supporting the view that all the concepts of the mind are acquired. Kant concludes, stating that “assuming something innate is decisively contrary to philosophy” (29: 16). This issue will be further developed, as we will see, in the *Critique of Pure Reason* and in other critical writings.

In *Reflection 4851*, dated to between 1776 and 1778, Kant divides metaphysics into general metaphysics (*metaphysica generalis*) and special metaphysics (*metaphysica specialis*), following the Protestant scholastic tradition.⁷³ General metaphysics deals with reason and its concepts, and coincides with transcendental philosophy, whose parts are ontology and the critique of pure reason (18: 9). In *Reflection 5130*, referring back to this division, Kant states that ontology is the science of the first elements of knowledge of the pure understanding, that is, concepts and judgments (18: 100).

In the *Critique of Pure Reason*, Kant’s conception becomes more complicated. Kant calls “critique” the philosophy of pure reason that examines propaedeutically the faculty of reason in its possible a priori knowledge (A 841/B 869). It contains all the principles of knowing a priori, both sensible and intelligible. Kant adds that “an organon of pure reason would be a sum total of all those principles in accordance with which all pure a priori cognitions can be acquired and actually brought about” (A 11/B 24). An exhaustive application of such an organon would constitute for Kant “a system of pure reason” (A 11/B 25). This system, following Wolff, has four main parts: (1) ontology; (2) rational physiology; (3) rational cosmology; and (4) rational theology. Ontology corresponds to transcendental philosophy, which “considers only the understanding and reason itself in a system of all concepts and principles that are related to objects in general, without assuming objects that would be given” (A 845/B 873). The “critique” is propaedeutic to this system of pure reason, but its utility is only negative, because it serves not for the amplification but only for the purification of reason (A 11/B 25). The “critique of pure reason,” as “critique,” is not, according to Kant, a part of transcendental philosophy, or rather it is, but only in a propaedeutic role.

In the *Critique of Pure Reason*, therefore, what was gnostology for the Aristotelians becomes the part of transcendental philosophy that examines the a priori condition for the possibility of knowledge by understanding an object in general, that is, categories and principles.

Categories, indeed, correspond to the simple terms and concepts of gnostological tradition. In this sense, if we want to take the parallelism to its extreme, gnostology would coincide with the “Analytic of Concepts.” Noology, on the other hand, in dealing with principles and axioms, would coincide with the “Analytic of Principles.”

Kant’s famous letter to Marcus Herz of February 21, 1772 already explained that the “analytic” was a part of metaphysics. The work, which should be titled *The Limits of Sensibility and of Reason*, would be composed in two parts, one theoretical and one practical. The theoretical part would be divided into a phenomenology, which in 1781 became transcendental aesthetic, and a metaphysics (10: 129). Most probably, in Kant’s perspective, the part of metaphysics would have included not only “Analytic,” but also the “Dialectic” and the “Doctrine of Method,” if it is true that his purpose was to deal with the nature and the method of metaphysics (10: 129).

In Kant, it is quite evident that disciplines like gnostology and noology, which were a matter of metaphysics, gradually turn into a new kind of logic, and that metaphysics could not be anything more than a logic.

HABIT AND PHYSIOLOGY

If the nature of the structures of the mind is quite clear according to Kant’s transcendental logic, then its origin is not so obvious. It is quite striking that to date Kantian scholarship has neglected to address this crucial question.⁷⁴ To understand Kant’s position, it is necessary to investigate the very nature of the “a priori” in critical philosophy, and to dismantle the ideas that considered the “a priori” to be innate. This commonplace is based on false biases for at least two reasons that I shall explain in this section: (1) Kant was a fierce opponent of the doctrine of innate ideas; and (2) in his writings he characterizes the pure concepts of the understanding to be acquired, as we have already seen in the *Inaugural Dissertation*, where he outlines a theory of knowledge according to which a priori concepts are acquired from the logical laws of thought upon their application to the object of sensation.⁷⁵ Yet, one may wonder, what has all this to do with Aristotle and the Aristotelian tradition? I want to suggest that Kant’s transcendental logic is based on a natural acquired logic,

which is a kind of Aristotelian habit that the mind attains, like a second nature, in occasion of experience.

Aristotle deals with the problem of habit in the *Categories* in two distinct places, as a category itself and as a kind of quality.⁷⁶ Habit, Aristotle states, differs from disposition in that it is more stable and durable.⁷⁷ Dispositions, in fact, are easily removable and change quickly. But if a disposition stays long, takes root in the mind, and is hard to remove, it becomes a habit.⁷⁸ Consequently, we can say that for Aristotle all habits are dispositions, but not all dispositions are necessarily habits.⁷⁹ In *Rhetoric*, Aristotle maintains that a habit gives rise to all the actions that we do because we are used to doing them,⁸⁰ and he adds that “habit is something like nature, for the distance between ‘often’ and ‘always’ is not great, and nature belongs to the idea of ‘always,’ habit to that of ‘often.’”⁸¹

The most important Aristotelian treatment of the theory of habits is in the *Nicomachean Ethics*. Aristotle characterizes five intellectual habits: (1) art; (2) science; (3) prudence; (4) wisdom; and (5) understanding.⁸² Art and prudence relate respectively to production and action, whereas the habits involved in logic are science, understanding, and wisdom. For science, Aristotle means scientific knowledge, that is, the knowledge of what is known as necessary.⁸³ This kind of knowledge is possible only through demonstration, which must be based on true and well-known principles.⁸⁴ These principles are provided by the understanding.⁸⁵ Wisdom is both understanding and science of higher things, like causes and principles, because wisdom both knows what follows from the principles and possesses the truth about the principles.⁸⁶

The reciprocal relations among science, understanding, and wisdom are developed by Aristotle in the final chapters of the *Posterior Analytics*, which we have already encountered as a crucial issue to understanding the genesis of facultative logic. According to Aristotle, wisdom is knowledge of true, higher, and superior things. Before knowing these things, however, we must know true things in general; that is, we must acquire scientific knowledge. Scientific knowledge is only possible through demonstration, but demonstration is based on principles, and only understanding gives assent to principles; therefore, for wisdom and scientific knowledge understanding is necessary. Thus, for Aristotle, understanding is the fundamental habit without which no science and no wisdom are possible, and the Aristotelian

tradition has always recognized the importance and significance of this particular habit. We have already noted that during Antiquity and the Middle Ages, the theory of habits was strictly related to the problem of acquired or speculative understanding. But it is also true that the problem of acquired understanding has to do with a second nature which is not immediately coincident with either the habit of understanding or with science.⁸⁷ Rather, as Charles Lohr has rightly pointed out, the search for the principles of demonstration, that is, the twofold process of ἐπαγωγή and νοεῖν, was completely neglected by the Aristotelian tradition before the Italian Renaissance. It was Jacopo Zabarella who rediscovered these two moments by means of which principles are found and known.⁸⁸ It is therefore necessary to examine Zabarella's treatment of these habits and his deep impact on Königsberg Aristotelianism.

In Zabarella, the issue of habit arises essentially in response to two questions: on the one hand, to characterize the nature of logic, and, on the other hand, to determine the extent of demonstrative knowledge. Zabarella tackled the question of habit in his logical works, in particular in the *De natura logicae*, as well as in the last chapter of his commentary to *Posterior Analytics*. According to Zabarella, logic cannot be identified with any of the five intellectual habits listed by Aristotle, because it does not deal with the object either from a theoretical or from a practical standpoint. It is not science, because its objects are second notions (*notiones secundae*), which are not universal, necessary, or real.⁸⁹ It does not coincide with the habit of understanding or wisdom, because the former has to do with principles, the latter with the cognition of first causes,⁹⁰ while logic has to do only with the structure of reasoning. Neither is it an art, because it does not have the power to construct or modify its object.⁹¹ Logic is not prudence, because prudence concerns actions, which are obviously not the object of logic.⁹² Rather, the effectiveness of logic consists in serving the perfect acquisition of the other five intellectual habits. As such, it is the condition without which understanding, science, wisdom, prudence, and art are not possible. Zabarella, therefore, conceives of logic, like grammar and rhetoric, as an intellectual instrumental habit, just because it is a tool and means for all the other disciplines.⁹³

Zabarella thematizes the habit of logic in connection with science, particularly in his commentary to *Posterior Analytics*. He deals