

Charles De Koninck and the Cosmos of the Natural Sciences

John G. Brungardt
Assistant Professor of Philosophy
The School of Catholic Studies
Newman University (Wichita, KS, USA)

Introduction

In his 1941 essay «Are the Experimental Sciences Distinct from the Philosophy of Nature?», Charles De Koninck argued that the philosophy of nature and the natural, experimental sciences are not formally distinct¹. Rather, the experimental or positive sciences are the natural, dialectical extensions of the philosophy of nature. He developed this qualified continuity thesis throughout the remainder of his career. While it yet has some adherents, today De Koninck's view seems to be in the minority. It seems more frequent to find Thomists maintaining that the philosophy of nature is a part or a mode of metaphysics, and at any rate distinct from the natural sciences². The great difference in education or training, vocabulary, and even social circles seems to reinforce and even to lead to this conclusion. What indeed does Athens have to do with Stockholm? Are there good reasons to continue to defend De Koninck's continuity thesis? What difference does it make for understanding the principles of natural philosophy? Might De Koninck's thesis help us to understand the philosophy of nature and the natural sciences as integral parts of one *habitus* of speculative knowledge?

The following paper will defend De Koninck's qualified continuity thesis. This view maintains that the experimental sciences—such as physics, chemistry, and biology—are the dialectical extensions of the Aristotelian-Thomistic philosophy of nature. I will also suggest, following some of De Koninck's students and learning from the opponents to this view, various ways in which De Koninck's account can be strengthened and furthered.

First, we will review De Koninck's 1941 article in which he first articulated his position (§1). Then we will examine certain key themes from its argument in more detail. The themes in question are three. First, we will discuss the key middle terms underlying De Koninck's argument: the mode of definition in a speculative science and the *telos* of the philosophy of

¹ In the main text, I will cite (with some minor corrections) the English translation in Charles DE KONINCK, *The Writings of Charles De Koninck: Volume One (Writings, v. 1)*, ed. and trans. by Ralph McInerny, Notre Dame, IN: University of Notre Dame Press, 2008, pp. 445–456. The French text of these quotations will follow in the footnotes, taken from Charles DE KONINCK, *Œuvres de Charles de Koninck: Tome I, 1. Philosophie de la nature et des sciences (Œuvres I,1)*, Y. Larochelles et T. De Koninck (dirs.), Québec: Presses de l'Université Laval, 2009, pp. 141–152.

² See, for example, Edward FESER, *Aristotle's Revenge: The Metaphysical Foundations of Physical and Biological Science*, Neunkirchen-Seelscheid, Editiones Scholasticae, 2019, pp. 1, 4, and see pp. 7–10.

nature as a type of inquiry (§2). Second, De Koninck's position depends upon a certain interplay between demonstration and dialectic within the philosophy of nature and the experimental sciences (§3). Lastly, De Koninck's thesis requires that, since it is connaturally suited for speculative inquiry about the cosmos, the human mind must begin with a grasp of common conceptions, which are vague and confused at first, before proceeding to the grasp of proper conceptions about the more concrete, specific order of natural causes (§4).

1. Summary of De Koninck's 1941 Essay

De Koninck's 1941 essay is structured in the manner of a scholastic *quaestio* (although without the *sed contra*'s). For economy of presentation, let us turn first to the principles which De Koninck uses to answer the question at issue—Are the experimental sciences distinct from the philosophy of nature?—and then consider the replies to the objections.

1.1. The response

The heart of De Koninck's *respondeo* defends the reason why there is unity between the philosophy of nature and the experimental sciences. It has two parts. The first is Aristotle's « natural path », described in *Physics*, I, 1. The second is an argument from the unity of the end of the inquiries of both the philosophy of nature and the experimental sciences. There is a third component, namely, the unity of the mode of definition, but this is only raised in the reply to the third objection. These three elements form the essential structure of his case whenever De Koninck furthered his view in later works³.

The « natural path » is a naturally necessary order within our intellectual cognition⁴. We must begin with what is more known to us before arriving at what is more known in itself; this entails that our intellects are at first in potency and only later achieve a complete act of understanding. Along the way, therefore, the mind is in between potential and actual knowledge. This means that we must first know the more general predicable whole before the more specific one—for instance, we must grasp « animal » before « human being »—because the more universal whole compares to the less universal, or more specific whole, as what is potential to what is more in act. What De Koninck proposes is that the Aristotelian order of inquiry into nature is entirely structured by this « natural path » of proceeding from the more to the less universal subject of inquiry.

This is not an idealist or Hegelian deduction of the more specific from the power of the more

³ For instance, consider Charles DE KONINCK, “The Unity and Diversity of Natural Science,” in *The Philosophy of Physics*, ed. by Vincent E. Smith, New York: St. John's University Press, 1961, pp. 5–24.

⁴ See DE KONINCK, *Writings*, v. 1, p. 446; *Œuvres I,1*, p. 142, which begins with a quote from Aristotle's *Physics* I, 1: « “La marche naturelle, c'est d'aller des choses les plus connaitables pour nous et les plus claires pour nous à celes qui sont les plus claires en soie et plus connaitables.” [. . .] Etudiant d'abord la propriété commune à tout êtres mobile, l'on descend vers les espèces les plus communes de mouvement; [. . .] »

generic without any extrinsic causal influence⁵. Rather, the natural path is really the account demanded by the dependence of the human mind upon a slow, determinative process of understanding through experiential and empirical inquiry into nature. We must return to experience to enrich our intellectual understanding with further determinative insights. Consequently, what the mind is at first actually able to grasp and understand is motion in general. Thereupon one would turn to investigate the types of motion, and the various specific domains of living beings. Thus, the intellectual progress of the mind of the philosopher of nature, insofar as such an inquiry is the work of reason, naturally follows the curricular order of Aristotle's treatises.

De Koninck also buttresses this argument from the natural path with an argument from the unity of the end of this inquiry: « The philosopher of nature seeks to know what natural things are, not in a confused manner, but in their proper concretion. The unity of that end is not broken by the diversity of means employed. On the contrary, it is the same end that governs them, as long as they provide a better knowledge⁶. » Thus, the single end unites in one inquiry all other habits of knowledge or skill that one uses: for instance, the use of mathematical symbolization or the technical ability to construct instruments of measurement⁷. As we will see below, this unity is expressed formally in the unified mode of definition belonging to the philosophy of nature.

Now, De Koninck notes that his interpretation is not against the *certitude* that Aristotle himself attributes to the specific conclusions of his own natural sciences, that is, those science further along the natural path. The more specific considerations rest upon evidence which do not definitively support Aristotle's specific conclusions; this leaves the more general considerations of natural philosophy untouched⁸. Nor is it counterintuitive to attribute *greater* certainty to what comes earlier in the natural order of inquiry into nature, as long as one distinguishes between types of certainty: the certainty *quoad nos* versus the certainty *quoad se*, or in itself⁹. Thus, the more specific consideration of nature—for instance, detailed studies of the causes of the leaps of fleas—will never replace the more general considerations of the *De Anima*, even though the more detailed studies complete what the *De Anima* begins¹⁰.

De Koninck also clarifies why it is that, despite the general philosophy of nature's being first

⁵ See DE KONINCK, *Writings*, v. 1, p. 447; *Œuvres I, 1*, p. 143: « Or, pour une raison qui ni le texte d'Aristote ni celui de ses grands commentateurs ne peuvent expliquer, l'on entend aujourd'hui en un sens idéaliste cette manière de procéder. »

⁶ DE KONINCK, *Writings*, v. 1, p. 449; *Œuvres I, 1*, p. 145: « Le philosophe de la nature désire savoir ce que sont les choses naturelles, non pas d'une manière confuse, mais dans leur concrétion propre. L'unité de cette fin ne sera pas rompue par la diversité des moyens à employer, c'est au contraire une même fin qui les commande, pourvu qu'ils permettent de mieux connaître. »

⁷ This also points to a way in which the continuity of the philosophy of nature and the particular sciences is qualified. I thank Louis Brunet, on behalf of an old question of Warren Murray's, for raising this point after the presentation of this paper.

⁸ See DE KONINCK, *Writings*, v. 1, pp. 450–451; *Œuvres I, 1*, p. 146–148.

⁹ See DE KONINCK, *Writings*, v. 1, pp. 451–52; *Œuvres I, 1*, p. 148–149.

¹⁰ See DE KONINCK, *Writings*, v. 1, p. 452; *Œuvres I, 1*, p. 149.

in the order of intellectual discovery, apparently no physicist or scientist every bothers to study it. «Isn't it true that the best modern physicists ignore almost all the questions studied in the first parts of the philosophy of nature? Would they be better physicists if they knew the definition of motion [. . .]¹¹?» De Koninck answers this with another question: «Would the bricklayer be a better bricklayer if he were an architect¹²?» De Koninck has in mind the image of the physicist who writes a popularized account of the advances of science and inevitably must enter into the domain of philosophical discourse. There is a natural completeness one someone who is only a bricklayer and not an architect. The *habitus* of the philosophy of nature introduces one to the whole domain of study, before one arrives at a grasp of the parts as such¹³.

1.2. Replies to objections

The replies to the various objections given at the outset of the article allow De Koninck to further develop his position. His first objection had argued that the philosophy of nature and the experimental sciences are different because the philosophy of nature is demonstrative, while the specific natural sciences are a dialectical mode of knowledge. This is especially the case when it comes to mathematical physics, since its conclusions are proposed as hypotheses to save the phenomena. De Koninck's reply is that the principles and terminus of both kinds of study are the same, since they both start with and are ordered to knowledge of sensible natures: « In this respect, the experimental sciences are only a continuation of the properly demonstrative science of nature¹⁴. »

The second objection had argued that, since the philosophy of nature remains in the realm of general and confused knowledge, and the experimental sciences do not, these latter better achieve the *telos* of the speculative inquiry of nature. The experimental sciences are different insofar as they are the successful replacements of the philosophy of nature. Yet De Koninck replies that they are more successful only under a certain qualification and dependence upon the philosophy of nature. One cannot identify the demonstrative root and the dialectical fruit with one another. The scientific image of the world cannot supplant the manifest image: « To identify philosophy of nature with the experimental sciences which are only the dialectical extension of it

¹¹ DE KONINCK, *Writings*, v. 1, p. 452; *Œuvres I, I*, p. 149: « N'est-il pas vrai que les meilleurs physiciens modernes ignorent à peu près le tout des questions étudiées dans les premières parties de la philosophie de a nature? Seraient-ils meilleurs physiciens s'ils savaient la définition du mouvement [. . .]? À cela on peut répondre par la question: Le maçon serait-il meilleur maçon s'il était architecte? »

¹² DE KONINCK, *ibid.*

¹³ He also offers a reason for this lack of accessibility to what is naturally prior in the development of our speculative *habitus* of knowing nature. That is, the physicists don't seem to miss the philosophy of nature because of the naturally prior attractiveness and intelligibility of concrete sense experience and mathematics; see DE KONINCK, *Writings*, v. 1, pp. 452–453; *Œuvres*, p. 150.

¹⁴ DE KONINCK, *Writings*, v. 1, p. 453; *Œuvres I, I*, p. 150: « Les sciences expérimentales ne sont sous ce rapport qu'une continuation de la science proprement démonstrative de la nature. »

is to destroy it in its root, to deny the most certain part of our knowledge of nature, as well as its most noble natural subject¹⁵. »

The third objection had argued that the philosophy of nature is characterized by a different sort of abstract consideration than the experimental sciences. The philosophy of nature considers things under the intelligibility of being, whereas the experimental sciences do not¹⁶. De Koninck denies this. All are characterized in common by defining their objects, in some way, with reference to sensible matter¹⁷.

The fourth objection¹⁸ had argued that the philosophy of nature ought really to be retained today as a general reflection upon the achievements of the experimental sciences. That is, the philosopher of nature ought to contemplate or reflect upon the modern experimental sciences so as to arrive at firmer conclusions about « nature in general » which is what Aristotelian natural philosophy had been striving for all along. Here, De Koninck replies by distinguishing between two sorts of universality: what is universal *in praedicando* and what is universal *in causando*¹⁹. The desire to reflect in a comprehensive way upon the specific conclusions of the experimental sciences is an expression of the desire to know the universal causes, not just the universal predicates, that obtain in the cosmos. However, we cannot conceive of the universal in causality apart from our general notions of nature, De Koninck argues, and therefore even our grasp of universal causes in the cosmos is conditioned upon the prior knowledge of the philosophy of

¹⁵ DE KONINCK, *Writings*, v. 1, *ibid.*; *Œuvres I, 1*, p. 151: « Identifier la philosophie de la nature avec les sciences expérimentales qui n'en sont que l'extension dialectique, c'est la détruire à sa racine, c'est nier la partie la plus certaine de notre connaissance de a nature, ainsi que son sujet naturel le plus noble. »

¹⁶ This objection De Koninck grounds on a contemporaneous text, that of Joseph DOPP, "Physique ancienne et physique moderne: Leurs conceptions de l'intelligible," in *Travaux du IXe Congrès International de Philosophie*, 5:166–74, Paris: Hermann et Cie, 1937, p. 172. Dopp opposes philosophy's focus upon « the intelligibility of being » to the sciences' focus upon « the intelligibility of relation » or « order ». De Koninck's original essay quotes a passage on p. 173 of Dopp's text where the second member of this opposition is fleshed out.

¹⁷ See DE KONINCK, *Writings*, v. 1, p. 454; *Œuvres I, 1*, p. 151: « Jamais la physique d'Aristote, des *Physiques* au *De Incessu Animalium*, ne fait abstraction de la matière sensible [. . .]. » Nonetheless, it is not until other articles that he fleshes out this reply. See especially his "Abstraction from Matter," *Laval théologique et philosophique* 13.2 and 16.1–2 (1957, 1960), pp. 133–96, 53–69, and 169–188, which is translated in *Œuvres de Charles De Koninck: Tome I, 2. Philosophie de La Nature et Des Sciences (Œuvres I, 2)*, T. De Koninck et Y. Larochelle (dirs.), X. Alvarez et B. Echivard (trads.), Québec: Presses de l'Université Laval, 2012, pp. 153–287.

¹⁸ There is a fifth objection, from the authority of Aristotle, based upon a text from *On the Parts of Animals*. The reply is also based upon a counterproposal concerning the textual interpretation of the passage. I omit this objection here.

¹⁹ An excellent treatment of this distinction is found in an article by a student of De Koninck's, Ronald MCARTHUR, "Universal *in praedicando*, Universal *in causando*," *Laval théologique et philosophique* 18.1 (1962), pp. 59–95.

nature. I will return to this idea in §2, below.

These objections or variations of them still plague contemporary Aristotelian-Thomistic philosophy of science, and indicate indirectly the accuracy of De Koninck's considerations. For instance, in his recent book, *Aristotle's Revenge*, Edward Feser defends a view of the separation of the philosophy of nature and the modern experimental sciences that retains elements of the first and third objections. Following arguments similar to those deployed by Henry Koren and Andreas van Melsen, Feser maintains that the philosophy of nature is a domain of metaphysics. The second and fourth objections are similar to the view of Ernan McMullin concerning the frivolity of continuing to defend an expressly *general* philosophy of nature²⁰. While it is not within the scope of this paper to address all of the concerns of Feser, McMullin, Koren, or van Melsen, it seems that, by defending and furthering the cogent case that De Koninck makes for the continuity of the philosophy of nature and the experimental sciences, one could then turn to address the concerns of contemporary scholarship more effectively. So, I will now turn to consider the three key elements of De Koninck's position mentioned previously.

2. The Mode of Definition and the *Telos* of the Philosophy of Nature

Despite the fact that it is only mentioned in the reply to the third objection, the unity of the mode of definition is what carries De Koninck's defense of the continuity between the philosophy of nature and the sciences. However, it is the case that the mode of definition in the philosophy of nature—defining its speculable objects with sensible matter—is what formally unifies the natural path of inquiry among the sciences of nature towards their shared *telos* of understanding the principles, causes, and elements of the natural substances that constitute the cosmos.

To the degree that there is a lack of attention as to why the mode of definition unifies a speculative science, the Aristotelian-Thomistic account of the sciences of nature is crippled. Various alternative criteria could be proposed (to which De Koninck's third objection only alludes). One could think that the philosophy of nature studies objects in a less general way than metaphysics, but in a more general way than the various natural sciences²¹. Another option could be to claim that the philosophy of nature studies deductive the application of metaphysical principles to material objects, whereas the experimental sciences consider material objects inductively, according to various law-governed modes²². Or, one could think that the philosophy of nature deals with necessary truths, while the natural sciences deal only with contingent truths²³. Or, lastly, one could maintain that the philosophy of nature achieves noetic insight at the first degree of intelligible visualization. The experimental sciences perinoetically approach this

²⁰ See Ernan McMULLIN, "Is Philosophy Relevant to Cosmology?" *American Philosophical Quarterly* 18.3 (1981), pp. 177–189.

²¹ This is part of Feser's approach, *Aristotle's Revenge*, p. 4.

²² See, for instance, the view of Peter Hoenen and his student Selvaggi, in Filippo SELVAGGI, *Cosmologia*, 1st ed., Romae, Universitatis Gregoriana, 1959, p. 9.

²³ This is another aspect of Feser's approach, see *Aristotle's Revenge*, pp. 4, and 6–7.

degree of universal consideration, and do so only asymptotically²⁴. What is the worthwhile insight of the Thomistic principle of abstraction from matter as unifying a type of speculative consideration? Is it still worth defending?

The central Aristotelian insight at issue here is the mode of being proper to an intellect that must seek its fulfillment in the intelligibility of a material cosmos. This question, which was called the central question about human thought by Duane Berquist²⁵, asks whether the way in which we conceive of things must be the way in which they exist. The Platonist answers this question in the affirmative: since the mind conceives of its objects in a universal and immaterial mode, those objects must exist in that same manner. Therefore the intellect, in order to achieve the truth, must have access to universal forms that exist separately from matter. Of course, the Aristotelian answer to the central question is that the universality and immateriality of the object of intellectual cognition arise because of its abstraction from matter, on the part of human intellectual capacities.

However, there is still a gap between the notion of abstraction from matter as the necessary condition for intellectual cognition of corporeal being and the claim that a particular degree or mode of such abstraction is what unifies a speculative science. De Koninck's insight lies in applying the Thomistic answer to how to fill such a gap to the question of the nature of the experimental sciences, and in particular mathematical physics. In brief, a speculable object is the *terminus* of a rational process—such an object is expressible as a conclusion or set of conclusions (e.g., statements about a scientific model or laws governing types of objects or processes). However, a rational process of such a sort is constituted by terms that belong properly to that inquiry, and to so belong such terms must be defined in a homogeneous manner. This « manner » that unifies the intentional or semantic character of the scientific terms in question is the mode of definition, as it were the soul of scientific discourse. Since even mathematical physics can only make use of its abstract laws of motion by means of the application of such *abstracta* to measured corporeal things, and since those corporeal beings insofar as they are measured must be defined with sensible matter, it follows that even the objects of mathematical physics are unified to the speculative object of the philosophy of nature²⁶.

This can be illustrated by a parallel case. Nancy Cartwright maintains that the laws of nature “lie,” that is, they propose claims about how nature behaves which are true only in abstraction—they are claims that can be selectively applied to nature, but which lack perfect adequacy to

²⁴ See, of course, Jacques Maritain, *Distinguish to Unite, Or, The Degrees of Knowledge*, ed. by Ralph M. McInerney, trans. by Gerald B. Phelan, Vol. 7 of *The Collected Works of Jacques Maritain*, Notre Dame, IN, University of Notre Dame Press, 1995.

²⁵ Duane H. Berquist, in a private lecture on Aristotle, *Physics* II, 2, 193b22–25 and 193b25–30, points out the centrality of this question in regard to contrary philosophical proposals about how the intellect achieves universal insight about material objects.

²⁶ In this paragraph, I am summarizing much of De Koninck's later articulations of this view; see, for instance, his article “Abstraction from Matter,” cited above. One should also consider the nuances added to this approach by De Koninck's student Bernard MULLAHY, “Subalternation and Mathematical Physics,” *Laval théologique et philosophique* 2.2 (1946), pp. 89–107.

concrete situations. This was first presented without an express consideration of the nature of universals²⁷. Nonetheless, the claim that the laws of nature “lie” by never being adequate to the fully concrete natural situation is able to be understood on the view that abstraction from individuating matter is present in the experimental sciences. Thus, on the one hand, the laws of nature lie because they are concerned with the formal, quantifiable structures of natural objects that can be formulated most clearly by mathematical means. On the other hand, the laws of nature still partially tell the truth because they are applicable to and ordered to understanding natural objects by design. This conceivability of how the laws of nature apply to natural things requires that we conceive of them in a proportionately adequate way, namely, by the abstract consideration of natural substances with their sensible, or mutable, common matter.

Because this mode of definition through common sensible matter is, as it were, the animating soul of natural scientific inquiry, it formally unifies the beginnings of the natural path to the *telos* of inquiry into nature. That is, from the beginning steps to the last possible achievement of the natural sciences, they will speak of nature in an idiom characterized by defining their object with common, sensible matter. This helps us to understand the importance of the distinction, briefly mentioned in De Koninck’s essay, between what is universal in predication and what is universal in causality. It would be inadequate to defend the philosophy of nature by saying that it, in contrast to the experimental sciences, treats of the “deeper” and “more fundamental” causes of natural things. Those who mount this defense give examples of what is universally common by predication: notions like act and potency, substantial form and matter, or final causality.

However, this is a “fallacy of false depth”, which is criticized by De Koninck in the following terms: « It is right to reproach those who are content with this kind of consideration as if they had attained the ultimate causes, their air of false profundity, unless one calls the confused and undetermined profound²⁸. » This is brought out further in De Koninck’s reply to his fourth objection: « When the scholastics say that in the experimental sciences are sought the most proximate causes of things, whereas the philosophy of nature seeks the ultimate causes, they are quite right, provided that by ultimate causes one means, not causes most universal in their predicable community . . . , but the ultimate causes which are first by reason of causality, and which we do not know save by way of the more proximate causes²⁹. »

Thus, far from being a reductionist account of the natural sciences, De Koninck’s argument

²⁷ See Nancy CARTWRIGHT, *How the Laws of Physics Lie*, Oxford, Clarendon Press, 1983.

²⁸ DE KONINCK, *Writings*, v. 1, p. 452; *Œuvres I, 1*, p. 149: « C’est donc avec raison qu’on reproche à ceux qui se complaisent dans ce genre de considérations comme si on y atteignait les causes dernières, leurs airs de fausse profondeur, à moins qu’on n’appelle profond le confus et l’indéterminé. »

²⁹ DE KONINCK, *Writings*, v. 1, p. 454; *Œuvres I, 1*, p. 152: « Quand les scolastiques disent que dans les sciences expérimentales on cherche les causes tout à fait dernières, ils ont entièrement raison, pourvu que par causes dernières on entende, non pas les causes les plus universelles selon la seule communauté de prédication

[. . .], mais les causes dernières qui sont les premières dans la raison même de causalité, et que nous ne connaissons comme telles qu’à travers les causes les plus prochaines. » See also the work of Ronald McArthur, cited above.

for the unity of their mode of definition is the necessary condition for their specific variety and, furthermore, even conceiving of possible universal causes operating upon the whole of the cosmos. The single mode of definition unifies into one end the various means employed to investigate nature's principles, causes, and elements: « The unity of that end is not broken by the diversity of means employed³⁰. » That is, the single mode of definition provides a single animating principle for any of the distinct intellectual or technical habits deployed in the investigation of nature, and this mode of definition ramifies into the specific sub-domains one can investigate. The mode of definition states what is universally common to the entire cosmos of the natural sciences insofar as they are united to a common end of inquiry as a universal final cause.

3. Between Dialectics and Demonstration

The second key element in De Koninck's account is the interplay between dialectical and demonstrative science that features in the 1941 essay. De Koninck even makes the concession that, when one compares the general considerations of the philosophy of nature in its first parts, like the *Physics* or the *De Anima*, to the more specific and concrete inquiries, the more general are dialectical by comparison. However, De Koninck also claims, when considered only at that level of generality, the considerations of the *Physics* are certain or sure: « The knowledge that we acquire in the earlier treatises, although it is quite determinate to the subject of the common as such, when it is considered in relation to species, remains dialectical³¹. » This seems to be a claim that the same part of natural philosophical science can be both demonstrative and dialectical, but in different respects. How is this possible?

In a brief footnote, De Koninck justifies this double-faced character of one and the same common subject of the *Physics* or *De Anima* by appealing to the two senses of the term « dialectical » defined by St. Thomas in his *Super Boetium de Trinitate*³². Now, what Aquinas actually discusses in that text are three ways of proceeding *rationabiliter*, or « according to reason » or « rationally ». De Koninck's reference is doubly elliptical. What he seems to be implying is that one could proceed from probable reasons and arrive at a dialectical terminus. In this case, reason's inquiry is not able to rest in the demonstrative grasp of the essence of its object of inquiry, and thus the science overall remains in uncertainty.

From this, we can address concerns raised against De Koninck's view by William Wallace or Benedict Ashley. Wallace contends that it is possible for the specific natural sciences—for

³⁰ DE KONINCK, *Writings*, v. 1, p. 449; *Œuvres I, I*, p. 145: « L'unité de cette fin ne sera pas rompue par la diversité des moyens à employer[.] »

³¹ *Ibid.*, « La connaissance que nous acquérons dans les traités antérieurs, bien qu'elle soit très déterminée au sujet du commun comme tel, quand on l'envisage par rapport aux espèces, reste dialectique. »

³² These two senses were later treated by one of De Koninck's students: Sheila O'FLYNN, "The First Two Meanings of 'Rational Process' According to the *Expositio in Boetium De Trinitate*," Ph.D. Diss., Université Laval, 1954.

instance, Newtonian mechanics—to achieve demonstrative insight into nature³³. Wallace contends that we cannot set too high a price on Aristotelian demonstrative knowledge of nature, for this makes no room for a partial or approximate truth that is, nonetheless, certain³⁴.

However, it seems that De Koninck's view only differs in emphasis. De Koninck clarifies that: « It is by an ever deepening experience that the mind emerges little by little from this dialectical condition. In this respect, the treatises nowadays designated as properly constituting the philosophy of nature are at bottom only an introduction to knowledge of nature properly speaking³⁵. » Since the philosophy of nature seeks to know things in their specific, essential concretion, there will be an inevitable interplay between demonstrative and dialectical knowledge. The achievement of the ultimate *telos* of the philosophy of nature by knowing the essences of the cosmos is, as De Koninck describes in “Concept, Process, and Reality”, akin to approaching a limit³⁶. However, along the way, the philosopher can nonetheless achieve certainty, provided the sufficient cognitive conditions are met.

Now, there are individual and collective aspects to the ever-deepening experience required to ground the *per se* known insights into one's scientific terms. That is, the intensity and clarity with which the middle terms of demonstrations are grasped, or the sheer number of fellow researchers needed to achieve such insights indicate others way in which the cosmos of the natural sciences is broadened and enriched today. Before saying how, I turn to the final key element of De Koninck's account.

³³ See William A. WALLACE, *The Modeling of Nature: Philosophy of Science and Philosophy of Nature in Synthesis (Modeling of Nature)*, Washington, DC, The Catholic University of America Press, 1996, and see his “Demonstrating in the Science of Nature,” pp. 157–159, in *From a Realist Point of View: Essays on the Philosophy of Science*, Washington, DC, University Press of America, 1979. In this same essay, Wallace gives a wide variety of examples of what ought to count as demonstrations in the modern sciences; for instance, p. 145 lists the physico-mathematical argument defending universal gravitation. De Koninck's view regarding the dialectical status of modern science is also critiqued by Benedict M. ASHLEY, *The Way toward Wisdom: An Interdisciplinary and Intercultural Introduction to Metaphysics*, Notre Dame, IN: University of Notre Dame Press, 2006, p. 220.

³⁴ WALLACE, *Modeling of Nature*, p. 421: « No room is allowed for partial truth, or obscure truth, or approximate truth. in the sense in which we have used those expressions. Either one knows everything or one knows nothing. And in the order of nature, that is decidedly not the way humans come to know things. It is possible to grasp a truth in a general way that is subject to further refinement and clarification. Such truth is revisable, but that does not make it fallible. Nor is an approximate truth necessarily probable and thus only a matter of opinion. One can be certain of an approximation, and on that ground the knowledge it provides can be scientific. »

³⁵ DE KONINCK, *Writings*, v. 1, p. 449; *Œuvres I, I*, p. 145: « C'est par une expérience toujours plus poussée que l'intelligence sort peu à peu de cet état dialectique. Sous ce rapport, les traités désignés aujourd'hui comme constituant proprement la philosophie de la nature ne sont au fond qu'une introduction à la connaissance proprement dite de la nature. »

³⁶ See Charles DE KONINCK, “Concept, Process, and Reality,” *Laval théologique et philosophique* 2.2 (1946), pp. 141–146.

4. The Natural Path: Follow What Is Common To All

The final key element of De Koninck's account is a theme to which he constantly returned in works like "Introduction to the Study of the Soul" or his Aquinas Medalist's address, "Three Sources of Philosophy". This line of thinking is also found in the teaching and writing of De Koninck's student Marcus Berquist³⁷.

The natural path is the natural intellectual necessity that we proceed from what is more known to us to what is more known by nature, and therefore from intellectual potency to intellectual actuality, and consequently from more universal grasps of things to the more specific. Thus, we naturally begin with conceptions of things that are common to all human inquirers, but precisely to the degree that they are common they are difficult to grasp distinctly. It also bears noting, following the contrast between dialectics and demonstration, above, that the common grasp of nature that is possible at the level of Aristotle's *Physics* is not merely a conceptual determination, or progress along the *processus in determinando*³⁸. Rather, as Marcus Berquist argues, there are also properly demonstrative moments in general natural philosophy—that is, it properly contains certain doctrines or conclusions along the *processus in demonstrando*³⁹.

This helps to answer the charge that the order in which the philosophy of nature proceeds intellectually is merely a curricular order, arrived at for the sake of pedagogy and partially the accident of the history of teaching philosophy⁴⁰. That is, the objector could maintain that the doctrines of the *Physics* come last in the order of discovery, while more particular, inductive considerations of the details of nature must come first. This is true if one is considering how our sense knowledge is prior to our intellectual knowledge all told. However, within the order of our distinct intellectual knowledge, the more general and vaguely grasped universals are of necessity first, because we couldn't grasp more specific concepts as such without a prior grasp of what is being specified. Consequently, the sorts of questions (and answers) in Aristotle's *Physics* must come first because of the nature of the human mind, not because of old Aristotelian teachers'

³⁷ See Charles DE KONINCK, "Introduction à l'étude de l'âme," in *Œuvres I, 1*, pp. 155–230. See also Marcus R. BERQUIST, "Common Conceptions and Proper Conceptions in the Study of Nature," in *Learning and Discipleship: The Collected Papers of Marcus R. Berquist*, Santa Paul, CA: Thomas Aquinas College, 2019, pp. 243–267. This line of thinking has also been further developed in Michael AUGROS, "Reconciling Science with Natural Philosophy," *The Thomist: A Speculative Quarterly Review* 68.1 (2004), pp. 105–141, and his lecture "A 'Bigger' Physics," MIT / Institute for the Study of Nature, January 8, 2008, URL: <http://www.isnature.org/Files/Augros_2009-Bigger_Physics.htm> (accessed 11 April 2020).

³⁸ See DE KONINCK, *Œuvres I, 1*, p. 176–180 for a discussion of this distinction.

³⁹ See BERQUIST, "Common Conceptions," p. 256: « Now that there is a doctrine to be derived from these common conceptions for which no further experience is necessary beyond the common experience we all have—this surprises many. » See pp. 256 and following for a discussion of example « doctrines » or demonstrations based from Aristotelian physics that are still true, even when considering Galileo and Newton's developments.

⁴⁰ This results in an *aprioristic* approach; see Edward MACKINNON, "Aristotelianism and Modern Physics," *Proceedings of the American Catholic Philosophical Association* 38 (1964), p. 104.

pedagogical preferences. As De Koninck notes in another work: « Nearly everyone holds that whatever interest the *Physics* may now possess can be no more than historical. This we interpret as a challenge, not so much to the particular doctrines it contains but, what is far more important, to the meaning and validity of the kind of questions its author assumes the human mind should be facing⁴¹. »

Conclusion

It bears noting that progress into the specific, concrete reaches of the cosmos of the natural sciences now exceeds the individual grasp of some one human knower, an *integral physicus*: «The integral *physicus* has become an impossible being. Certainly, we should rejoice at this. But not without regretting these limits of the individual intelligence⁴².» The sciences of nature cannot be mastered by one man alone. Correlative to the cosmos of types of specific knowledge is a cosmos of knowers, which, within various intellectual communities, which must be defined by common goods. In the case of the cosmos of knowers in the philosophy of nature and various specific experimental sciences, this common good is achieving the theoretical good of truth with respect to the essential intelligibility of the physical cosmos.

To put it in terms of the *Posterior Analytics*, the grasp of certain middle terms in the arguments of the specific sciences are now the shared common goods of various intellectual research communities. A complete grasp of all the relevant evidence, experimental data, and theoretical structure exceeds the capacity of the individual intelligence as such. This social good of theoretical knowledge, demanded as a method to know the cosmos at the deepest and most causally universal of scales, mitigates any concern over a loss of classical Aristotelian demonstrative knowledge at such levels. Here, too, the private intellectual good is subordinated to the common good. At the same time, however, it also highlights the natural and even pedagogical importance how such a research community ought to find its theoretical unanimity —by « finding strength in what is common to all » as Heraclitus says. That is, such communities of inquiry ought to be united through a common philosophy of nature, rooted in a beginning that is common to all, both in their common predicability and definitional mode as well as in the common *telos* sought in such theorizing. This is the importance of seeing why the philosophy of nature is not distinct from the experimental sciences: to preserve the theoretical common good of the human knowledge of nature.

⁴¹ Charles DE KONINCK, “Random Reflections on Science and Calculation,” *Laval théologique et philosophique* 12.1 (1956), p. 102; see *Œuvres I*, 2, p. 311: « Presque tout le monde considère que l’intérêt que la *Physique* peut maintenant avoir ne peut être qu’historique, ce que nous interprétons comme un défi, non pas aux doctrines particulières qu’elle contient mais, ce qui est bien plus important, au sens et à la validité du type de questions considérées par son auteur comme devant se poser par l’esprit humain. »

⁴² See DE KONINCK, *Œuvres I*, 1, p. 230: « Le *physicus* intégral est devenu un être impossible. Certes, il faut s’en réjouir, mais non pas sans regretter ces limites de l’intelligence individuelle. »