

THE AQUINAS REVIEW
OF
THOMAS AQUINAS COLLEGE

Vol. 19, 2013–2014

ISSN 1076–8319

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The Aquinas Review is published annually by the Office of the Dean, Thomas Aquinas College, Santa Paula, California; Michael F. McLean, President; Brian T. Kelly, Dean. Unsolicited articles, reasoned criticisms of articles, and letters are welcome.

Correspondence should be addressed to: Editor, The Aquinas Review, 10,000 North Ojai Road, Santa Paula, CA 93060. A subscription form follows the final article.

Editor's Statement

DR. RONALD P. MCARTHUR, the founding editor of *The Aquinas Review* and the editor of every issue for the past twenty years, died October 17, 2013, soon after last year's issue of this journal was sent to the printer. He has been sorely missed by his family, friends, colleagues, and students. Please pray for the repose of his soul and the comfort of his family.

In the late 1960's Dr. McArthur was among the few lay scholars who recognized that liberal education had disappeared from our nation's Catholic universities. In response, he and several colleagues designed a program of liberal education that was, in his words, "seriously intellectual and loyal to the teaching Church." The efforts of these men came to fruition in the founding of Thomas Aquinas College in 1971. He himself was chosen to be the founding president of the College, which he led for the next twenty years, stepping down in 1991.

His service to the Church, however, was not over. Recognizing that the College could and should share something of its intellectual life with those not on its campus, he proposed that it sponsor an academic journal. Thomas Dillon, then president of the College, agreed, and in 1994 the College published the first issue of *The Aquinas Review*. Since then tutors, graduates, and scholars have used the journal to explore in depth the central questions in the life of the mind.

Although Dr. McArthur did not edit our current issue, we hope that it would meet with his approval. The subsequent issue, I am afraid, would not. His humility, however, should not be an obstacle to our piety: *The Aquinas Review* for 2015 will be published in his honor and feature articles dedicated to Dr. Ronald P. McArthur.

Anthony Andres
Editor

Preface

At Thomas Aquinas College we often say that the education we provide is only a beginning. For the most part, our students are reading the important works in our program for the first time, and the class discussion, while certainly helping them to better understand the principal arguments and themes in the readings and to acquire the intellectual virtues, only introduces them to the profoundest truths and deepest questions that have engaged mankind for centuries.

Accordingly, it is fitting that the College publish *The Aquinas Review* to honor its patron and to provide a forum for a deeper consideration of those matters which constitute its curriculum and are central to genuine Catholic liberal education. Consistent with the nature of the College itself, this review is marked by fidelity to the *Magisterium* of the Catholic Church and a respect for the great tradition of liberal learning which is our common heritage.

The essays in *The Aquinas Review* reflect positions taken by their authors and not necessarily by the College itself. The editor – in collaboration with the editorial board – determines the contents of each issue. Any interested person may submit an essay for consideration or letters or comments on articles already published.

It is our hope that *The Aquinas Review* will be a source of wisdom to its readers and contributors.

Michael McLean
President, Thomas Aquinas College

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**FIDELISSIMUS DISCIPULUS EJUS:
CHARLES DE KONINCK'S EXPOSITION OF
AQUINAS' DOCTRINE ON THE COMMON GOOD¹**

Fr. Sebastian Walshe, O. Praem.

Charles De Koninck taught at Laval University in Quebec and wrote on virtually every subject that occupied the mind of St. Thomas: the Philosophy of Nature and of the Soul, Ethics and Politics, Metaphysics, Theology, even Mathematics. One of his most significant and lasting contributions to the *philosophia perennis* was his exposition of St. Thomas' doctrine of the common good. This paper aims to impart a clearer and more profound understanding of St. Thomas' doctrine of the common good with Charles De Koninck as our guide. To this end, I will

Fr. Sebastian Walshe, O.Praem., is a graduate of Thomas Aquinas College (1994). He completed his Masters in Theology at the Angelicum in 2004, and his Doctorate in Philosophy in 2005. He joined the Norbertines in 1998 and was ordained a priest in 2005. He now teaches philosophy at St. Michael's Abbey, Silverado, Calif.

¹The title of this article is borrowed from a chapter of Charles De Koninck's essay *In Defense of St. Thomas*, and was originally a title given to Peter of Auvergne, a thirteenth century scholar and student of St. Thomas, by Ptolemy de Luca on account of his fidelity to the doctrine of St. Thomas. In our own time, where there is so much disagreement among those who call themselves Thomists, it seemed right to me that, in view of his complete fidelity to St. Thomas on the subject of the common good, this title might be said without hyperbole of De Koninck.

first expose some pitfalls that can impede our understanding of St. Thomas' doctrine; second, I will lay out some important distinctions which Charles De Koninck proposed as keys to understanding Aquinas' doctrine; and third, I will briefly identify some important ways that this doctrine contributes to Theology.

Some Difficulties

There are a number of difficulties which could impede a correct understanding of St. Thomas' doctrine on the common good. I will consider three which are particularly important.

The first difficulty facing those who want to understand St. Thomas' doctrine on the common good correctly is that St. Thomas himself never wrote a treatise dedicated to the common good as such. His discussions of the common good are spread piecemeal throughout his works in widely diverse contexts. Given the difficulty of the subject and the various and contradictory understandings of it even among those who claim to be disciples of St. Thomas, the modern student of St. Thomas may be left saying to himself: "Alas! if only St. Thomas had written a *Quaestio Disputata De Bono Communi*."²

The second difficulty faced by those attempting to attain to a scientific understanding of the common good is the wide latitude of meanings to which the phrase is susceptible.³ Taken separately, both of the terms "common" and "good" are used in widely diverse senses: we speak of common sense and of the commonwealth, of good ice cream and good arguments. And so when these words are brought together the likelihood of

²It is of interest to note that one of St. Thomas' contemporaries, Remigio de Girolomi, did indeed write a treatise on the common good which includes a number of objections and replies.

³See G. Froelich, "The Equivocal Status of Bonum Commune," in *The New Scholasticism*, 63, Winter 1989, 38-57; and "On Common Goods" in *The Aquinas Review*, vol.15, 2008, 1-26.

confusion of meanings is not merely added, but multiplied. The highway system, children, world peace and God are all called common goods. Therefore, a large part of explaining St. Thomas' doctrine on the common good is making those distinctions necessary for an accurate understanding of the meaning or meanings St. Thomas had in mind in the different contexts in which he wrote.

A third difficulty encountered in coming to a distinct understanding of the common good is arriving at a sapiential perspective on the common good: that is, not only understanding the distinct meanings of common good, but ordering those meanings in such a way as to see which meaning or meanings are primary and of most interest to the wise man. The meaning of the common good in which St. Thomas was most interested, the sense which he identified as most profound and important in both Philosophy and Theology, is a meaning very far removed from our senses or imagination. It is therefore a meaning less known to us. And since the human mind habitually falls back upon better known meanings of words, we must constantly be on our guard not to confuse a better known meaning with the one we are seeking to treat here. Our task therefore is to order the meanings in such a way as to lead the mind from those pedestrian meanings of the expression, which are better known *quoad nos*, to that most intelligible and proper concept of the common good most relevant to wisdom.

As we shall see, it is precisely because Professor De Koninck was keenly aware of these three difficulties that he is such a valuable guide to understanding St. Thomas' doctrine on the common good.

Approaching an Understanding of the Common Good

Our first experience of goods, the first things to which we give the name "good," are sensible goods and the pleasures that

accompany them. Ice cream and warm hugs are good in this sense. We find that we have a natural desire to possess them and rest in them. As we grow and become aware of things beyond the realm of sense experience, we start to recognize that we also have a desire for these non-sensible things as well: we desire our parent's love and approval; we desire justice (children, even at a very young age, will insist that they be treated fairly); we desire to know the truth. These things are not the same kind of things as sensible goods, but since they too are objects of our desires, we give them the same name "good," but with the vague realization that they are not good in the same sense of the word. After some time, as we reflect more upon our experience of the world, we recognize that in all things there seem to be natural inclinations to act and be acted upon. Rocks tend downward. Plants tend to grow and reproduce. New life, seeds and embryos, tend to develop from the imperfect toward the perfect. We see that they tend toward determinate ends, and because those ends are like the objects of our desires, we call them "goods" as well. And so a new meaning of the word "good" comes to be, different, but related, to our original meaning. We say that it is good for a tree to bear fruit and even for a rock to be down. This final application of the term good is universal, and one could even say "metaphysical," since it is applied to all beings: it belongs to being, as being.

Bound up in our experience of these different but related goods is the experience of cause and effect. We notice that these goods are somehow a cause of the actions (and sometimes even the very being) of the things for which they are good. The good ice cream is a cause of my opening the freezer and scooping a heaping bowlful for myself after dinner. This is not to deny that sometimes goods can also be effects. But observe that even when we notice that some good is an effect, it is also a cause in a different way: The good music is an effect of the skill of the musician

who produces it, but it is also the reason why he acquires and employs his skill. Health is the effect of walking, but it can also be the cause for which someone walks. Natural things too appear to act for the sake of goods, as if the good is somehow a cause of the activities or being of natural things. Even if philosophers of nature and natural scientists disagree about whether the good really is a cause in nature, they all agree that it looks that way; and naturalists from Empedocles to Darwin and beyond have devised intricate theories to explain why these appearances are merely that: apparent but not real. So the idea that the good is somehow a cause, even among non-rational beings, is where we start: it is something very familiar to us.

Let this suffice for a first approach to the idea of that which is good. The good is what is desirable, the object of an intrinsic inclination. And it is somehow also experienced or perceived as a cause.

Key Distinctions

When St. Thomas spoke about a common good as opposed to a private good, what precisely did he mean by the terms “good” and “common”? Here is where Professor De Koninck serves as an invaluable guide. As I mentioned before, St. Thomas never wrote a systematic treatise on the common good. His texts are found scattered through dozens of works in various contexts. In his work, *On the Primacy of the Common Good: Against the Personalists*,⁴ and in his subsequent polemic, *In Defense of St. Thomas*,⁵ De Koninck brought together many of the most important texts of St. Thomas on this question. In these works, De Koninck makes a number of key distinctions

⁴In *The Aquinas Review*, Vol.4, No.1 (1997), 1–131; hereafter “PCG.”

⁵In *The Aquinas Review*, Vol.4, No.1 (1997), 171–349; hereafter “DST.”

(themselves found in St. Thomas) in order to lay out St. Thomas' doctrine clearly and in order. Here I shall focus on three key distinctions.

Distinction 1: Integral Whole vs. Universal Whole vs. Potential Whole

Since that which is common is universal and a kind of whole, one key distinction which De Koninck uses to interpret St. Thomas' doctrine on the common good is the distinction among the kinds of wholes. St. Thomas distinguishes three chief kinds of wholes and corresponding parts: the integral whole, the universal whole and the potential whole. Here is one text explaining the distinction:

The division of the [angelic] hierarchies into orders is of a potestative whole into its potential parts, just as the soul is divided into its powers: and this whole is as if a medium between the universal whole and the integral whole. For the universal whole is in each of its parts according to essence and complete power, hence it is predicated equally of each of its parts. But the integral whole is not in each of its parts according either to essence or complete power, and therefore, it is in no way predicated of its parts. But the potential whole is present according to essence in each of its parts, but it is present according to complete power [only] in its highest part, since the superior power always has in itself more completely those things which are in the inferior powers.⁶

De Koninck is aware that of the three kinds of whole, the integral is best known, the universal second best known and the potential whole is least known to us. A sign of this is that St. Thomas explains the potential whole by means of the other two.

⁶*In II Sent.*, d.9, q.1, a.3, ad.1.

A simple example will illustrate the difference between an integral whole and a universal whole. A triangle can be considered as an integral whole which is composed of its parts, namely, its three sides. It can also be considered as a universal whole which is divided into the three species or kinds of triangle, namely, equilateral, isosceles and scalene. In the integral whole no part can be given the name of the whole, since no part is what the whole is. But in the case of a universal whole, each part is what the whole is: an equilateral triangle is as much a triangle as an isosceles triangle is.

Another example can be used to explain the difference between a potential whole and the other kinds of whole. Color can be divided into its various species, such as blue, white, yellow, green, red, etc. In this case, color is considered as a universal whole and its various species, all of which are themselves colors, are its universal parts. But it is also true that the color white has the ability to produce the other colors, such as when white light is passed through a prism, the various colors of the spectrum appear. In this case, white is a potential whole which includes the various colors of the spectrum as its parts since it has the ability to produce those colors. Notice how different this is from the universal whole, since none of those particular colors of the spectrum produced by white are themselves white, even though they are somehow contained by and in white.

As I mentioned before, we have a tendency to fall back upon meanings of terms that are better known to us. And thus we should expect that the less known senses of the term “whole” will sometimes be confused with the better known senses of the term “whole.” An interesting example of this is found in the Platonic dialogue *Parmenides*. There the young Socrates attempts to defend his doctrine of universals against the objections of the older, wiser Parmenides. At one point in the dialogue,

Parmenides tricks Socrates into confusing the universal whole with the integral whole:

[Parmenides:] "Do you think the whole idea, being one, is in each of its many participants, or what?"

"Yes, for what prevents it from being in them, Parmenides?" said Socrates.

"Then while it is one and the same, the whole of it would be in many separate individuals at once, and thus it would be separate from itself."

"No," he replied, "for it might be like day, which is one and the same, is in many places at once, and yet is not separated from itself; so each idea, though one and the same, might be in all its participants at once."

"That," said he, "is very neat, Socrates; you make one to be in many places at once, just as if you should spread a sail over many persons and then should say it was one and all of it was over many. Is that not about what you mean?"

"Perhaps it is," said Socrates.

"Would the whole sail be over each person, or a particular part over each?"

"A part over each."

"Then," said he, "the ideas themselves, Socrates, are divisible into parts, and the objects which partake of them would partake of a part, and in each of them there would not be the whole, but only a part of each idea."

"So it appears."⁷

The young Socrates, unacquainted with the distinct meanings of whole and part, falls back upon a better known sense of the word whole, after which he finds himself in a maze of contradictions.

⁷*Parmenides*, 131b–c, H.N. Fowler translation, Loeb Classical Library 167 (Cambridge, Mass.: Harvard University Press, 1977), p. 213.

It is not surprising, therefore, that when there is talk of the common good, what comes first to mind is a kind of aggregate or sum of private goods. Indeed, this is one legitimate sense of the expression (for example, St. Thomas speaks of this kind of common good in relation to distributive justice⁸). But it is not the most profound or metaphysically important sense of common good. The sense of common good that we are after is that which is most of all the perfection of beings, especially persons, and which is the foundation for societies of persons. Explaining why the common good is not an aggregate or sum total of singular goods, De Koninck says:

The common good is greater not because it includes the singular good of all the singulars. In that case, it would not have the unity of the common good which comes from a certain kind of universality in the latter, but would merely be a collection, and only materially better than the singular good.⁹

The good which is the foundation of society, on the other hand, is common as a perfective cause: one whose essence belongs to each member of the society.

The common good is not a good other than the good of the particulars, a good which is merely a good of the collectivity looked upon as a kind of singular. In that case, it would be common only accidentally; properly speaking it would be singular...But when we distinguish the common good from the particular good, we do not mean thereby that it is not the good of the particulars; if it were not, then it would not be truly common.¹⁰

⁸See, for example, *S. T.*, II-II, q.61, a.1, ad.1.

⁹PCG, 16.

¹⁰PCG, 17.

Confusion of a good which is common as a collection and a good which is common as a cause perfecting the particulars to which it is communicated can result in serious errors. De Koninck identifies totalitarianism as one of these errors:

In totalitarian regimes, the common good is singularized, and it is opposed as a more powerful singular to the singulars which are purely and simply subjected. The common good loses its distinctive character; it becomes alien. It becomes subordinate to this monster of modern invention which is called the State...¹¹

Also to be avoided is the confusion of the common good as a cause, which is a potential whole, with the good common only according to predication.¹² The name "good" can be said of many individuals, and this is to be common, or universal, in predication. This is an instance of a universal whole. On the other hand, the good can be a real, determinate being and a universal cause in things. This is an instance of a potential or potestative whole. The good which is universal in predication is less distinct and determinate than the specific goods receiving the universal name "good." In contrast, the good which is a cause and a potestative whole is the reason for the determination and specificity in the goods it causes. For example, the good of victory determines completely the order and movements of all the parts of the army. These orders and movements are themselves certain intermediate goods caused by the determinate victory toward which they are ordained: each one is chosen only to the extent that it seems to lead to the good of victory.

¹¹PCG, 66. One thinks immediately of the *Leviathan* of Hobbes, which De Koninck most certainly had in mind as he wrote this passage.

¹²On this distinction see R. McArthur, "Universal in *Praedicando*, Universal in *Causando*," *Laval Théologique et Philosophique*, XVIII, n.1, (1962), 59–95.

The common good which, according to De Koninck, is of most interest to the wise man, that good which is the foundation for the society of rational beings and the whole order of the universe, is a good common as a cause and potential whole,¹³ taking potential here in the sense of an active power. As St. Thomas teaches:

Something can be called common in two ways. In one way through predication. But in this way the common is not the same in number in the diverse instances...The other way is something common according to participation of one and the same thing according to number. And this community is most of all able to be found in those things which pertain to the soul, since through it there is reached that which is the good common to all things, namely God.¹⁴

Distinction 2: The Good as Efficient Cause and the Good as Final Cause

Another key distinction is between the good understood as final cause and the good understood as efficient cause.¹⁵ De Koninck begins “The Primacy of the Common Good” with these lines: “The good is what all things desire insofar as they desire their perfection. Therefore, the good has a notion of a final cause.”¹⁶ Later, in his work *In Defense of St. Thomas*, De Koninck adds further: “It should be clear that the most

¹³See, for example, DST, 233.

¹⁴*In IV Sent.*, d.49, q.1, a.1, qc. 1, obj.3 & ad3. Also see S.C.G., III, c.17.

¹⁵Beginning in 1992, with an article published by W.N. Clarke (“Person, Being and St. Thomas,” *Communio* 19), a series of debates emerged on this issue, including contributions by D.L. Schindler, S.Long, G.A. Blair and B.T. Blankenhorn. For a summary of the debate see B.T. Blankenhorn, “The Good as Self-Diffusive in Thomas Aquinas” *Angelicum*, LXXIX, n.4 (2002): p.803–837.

¹⁶PCG, 14.

proper and profound meaning of the term 'good' is *perfectivum alterius per modum finis*.¹⁷ The good is not any cause, but the final cause which is perfective of the thing for which it is good.

To take an example, knowledge is a good for man. But the good which is knowledge can cause in two ways. On the one hand, a person having knowledge can teach someone else and produce knowledge in that other person. This is to diffuse itself as an efficient cause in virtue of the possession of a form (i.e., the quality of knowledge). On the other hand, the good which is knowledge can also diffuse itself as a final cause, as something attractive to another. This happens, for instance, when a man sees knowledge as something desirable, so that he applies himself to study, investigation and contemplation in order to gain that knowledge which he desires. The knowledge here is not a form by which an agent acts on him, but rather it is an end which he desires as something perfective of him.

Let us look in greater detail at this distinction. De Koninck brings forth two texts of St. Thomas which are especially important in understanding the distinction between the good as final cause and the good as efficient cause. The first is taken from the *Summa Contra Gentiles*:

The communication of being (*esse*) and goodness proceeds from goodness. Which indeed is clear both from the nature itself of the good, and from its notion. For naturally the good of any one thing is its act and perfection. Moreover, anything acts from this: that it is in act. Furthermore, by acting it pours out being (*esse*) and goodness into other things. Hence, also it is a sign of perfection of something that it is able to produce its like: as is clear from the Philosopher in the fourth book of the *Meteorology*. But the notion of the good is from this: that

¹⁷DST, 253.

it is desirable. This is the end, which also moves an agent to acting. Because of which the good is said to be diffusive of itself and of being (*esse*).¹⁸

In this text the good is considered under two aspects, its nature and its notion or definition (*ratio*). According to its nature a good thing is something in act, and it therefore has the capacity to move other things from potency to act as an efficient cause. According to its proper notion or definition, however, the good is something desirable. Under this latter formality, the good is a cause in another mode. St. Thomas makes this clear in a second text from his *De Veritate*:

When it is said that the good is diffusive according to its notion, diffusion is not to be understood as it implies the operation of an efficient cause, but as it implies the relationship of a final cause. And such a diffusion is not by the mediation of some superadded power. Moreover, the good signifies the diffusion of a final cause, and not of an agent cause: first since an efficient [cause], insofar as it is such, is not the measure and perfection of a thing, but rather its beginning, and then since the effect participates in the efficient cause according to assimilation of form only, but a thing obtains the end according to its whole being (*esse*), and the notion of the good consists in this.¹⁹

Here St. Thomas carefully distinguishes what is meant by the self-diffusion of the good as final cause from the self-diffusion of an efficient cause. While implying that the notion of self-diffusion is more apparent to us in the case of efficient cause, he nevertheless denies that all self-diffusion of causes is reduced to a kind of efficient causality. More than this, he even indicates

¹⁸S.C.G., I, c. 37.

¹⁹*De Veritate*, q.21, a.1, ad 4.

that the more profound sense of self-diffusion is attributed to the good as final cause, for the good brings the *whole* being to its *whole* perfection.

In summary, it can be said that the good, as something in act (which every good thing is), diffuses itself by way of efficient and exemplar causality.²⁰ It can even be said that this is the sense of diffusion which is better known to us. This explains why we tend to fall back upon this sense in which the good is a cause.²¹ De Koninck was aware of this and was careful to keep in mind that the good, considered precisely *as good*, diffuses itself not as an efficient cause, but by way of final causality.²²

For De Koninck, the failure of many modern philosophers to account correctly for the relationship between the person and society results from a failure to approach the problem from the perspective of final causality:

Instead of discussing the problem in terms of "person" and "society," I approach it in the fundamental terms of "proper good" and "common good." Ultimately, person and society are not to be judged by what they *are* absolutely, but by what is their perfection, *i.e.*, by what

²⁰See *S.T.*, Ia, q.19, a.2, c.

²¹This seems to have been the cause of one of the more serious errors of Fr. Eschmann, to whom De Koninck was responding in this article.

²²Upon close examination it becomes apparent that these two modalities of self-diffusion of the good have a determinate order to each other. The reason for this is that final causality and efficient causality have a determinate order to each other. The final cause is the cause of the causality of the efficient cause. If the good were not diffusive as good (*i.e.*, by way of final causality), it would not be diffusive as something actual (*i.e.*, by way of efficient causality), for the very inclination which is correlated to the good in the subject which desires the good is the principle of acting in that subject. Without this inclination, without some determinate end, the agent would have no reason to act one way rather than another, and so it would not act at all. Moreover, by being drawn closer to the end which is its good, a being becomes more and more actual, and hence, more and more capable of acting upon others by way of efficient causality.

is their good; that is the only way in which Aristotle and St. Thomas ever discussed this problem. To look upon the absolute comparison of the person and society as the most basic consideration is distinctly modern. It is also distinctly modern to accord absolute priority to the subject...²³

Distinction 3: The Good Perfecting the Speculative Intellect vs. the Good Perfecting the Practical Intellect

The third distinction which De Koninck lays out is the distinction between the good as perfective of the rational creature in the speculative order and the good as perfecting the rational creature in the practical order. De Koninck understands St. Thomas to teach that in the speculative order and the order of separated substances the primacy of the common good has its truest application. Here is the text of St. Thomas, with the objection first, followed by his response.

It appears that beatitude consists more in an act of the practical intellect than of the speculative intellect. For to the degree that some good is more common, so much more is it divine, as is clear in the first book of the *Ethics*. But the good of the speculative intellect singularly belongs to him who beholds, while the good of the practical intellect is able to be common to many. Therefore, beatitude consists more in the practical intellect than in the speculative intellect.

And now for the response:

To the first objection it ought to be said that the good to which the speculative intellect is united through cognition is more common than the good to which the practical intellect is united, inasmuch as the speculative

²³De Koninck, DST, 319.

intellect is more separated from the particular than the practical intellect, whose cognition is perfected in an operation which consists in singulars.²⁴

De Koninck comments:

St. Thomas avoids distinguishing the major (“Quanto aliquod bonum est communius, tanto est divinius”) [To the degree that a good is more common, so much more is it divine]. On the contrary, he shows that the *dictum authenticum* applies more perfectly to the good of the speculative intellect than to that of the practical. And we must note carefully that St. Thomas calls “communius,” not the good which consists in the *act* of the speculative intellect, but the “bonum *cui* intellectus speculativus *conjungitur* per cognitionem,” [the good to which the speculative intellect is united through cognition] and this is objective beatitude. The good of the speculative intellect as such is more common because it is formally more abstract, more separated from the singularity of the operable which involves potentiality, and hence, more communicable.²⁵

²⁴*In IV Sent.*, d.49, q.1, a.1, qc. 3, obj.1 & ad1. St. Thomas goes on in his response to make further precisions which do not, however, alter the first observation he made in the beginning of his response. He adds: “But this is true, that the attainment of the end to which the speculative intellect arrives, inasmuch as it is such, is proper to the one attaining; but the attainment of the end which the practical intellect intends is able to be proper and common, inasmuch as through the practical intellect someone directs both himself and others to the end, as is clear in the ruler of a multitude. But someone, from the fact that he beholds, is himself singularly directed unto the end of speculation. However, the end itself of the speculative intellect surpasses the good of the practical intellect as much as its singular attainment exceeds the common attainment of the good of the practical intellect. And therefore, the most perfect beatitude consists in the speculative intellect.” This part of the response overcomes the fallacy of transgressing genera or orders of good. For it is true that a private good of a higher order may be preferable to a common good of a lower order.

²⁵De Koninck, DST, 312.

If one considers the dictum “The more common a good is, the more divine it is,” accepting “good” here to mean that which is perfective of another as an object and end, then the dictum holds more perfectly in the speculative order since the notion of diffusion and communicability can be more perfectly applied to that which is more separated from matter and particulars. So the common good in this most profound sense extends even beyond the moral sciences: it is a cause which extends to being as such. The words of Aristotle at the beginning of his *Metaphysics* are to the point:

The supreme science, and superior to any subordinate science, is the one which knows that for the sake of which each thing must be done. And this is the good in each case, and in general the highest good in the whole of nature...it is this science which must investigate the first principles and causes, and the good, or final cause, is one of the causes.²⁶

I think this is a point on which the eminent Thomist Jacques Maritain was in error. According to Maritain, the good of the speculative order, as opposed to a good of the practical order, is not a common good in the strict sense.²⁷ Maritain

²⁶*Metaphysics*, Book A, ch.2: 982b5–10. This text comes at the end of an argument in which Aristotle reasons from a nominal definition of wisdom (the best kind of knowledge) to an essential definition of wisdom (the knowledge of the first and most universal cause or causes). And since the final cause is the cause of the causality of the other genera of causes, Aristotle ultimately concludes in this text that wisdom is most of all a knowledge of that good which is the ultimate cause of being as such.

²⁷Maritain argues that not only is the principle “the common good is more divine than the private good” to be understood analogously but also that its primary analogate is found in its application to human society and human goods. He asserts that St. Thomas gives this *dictum authenticum* “its full value in strictly social matters.” (Jacques Maritain, *The Person and the Common Good*)

seems to fall back upon a more known sense of the term "good" which prevents him from appreciating the full amplitude and import of the common good: a good which is not only the foundation for every society of rational beings, men and angels, but is absolutely first in the whole order of causes.²⁸

Some Applications to the Science of Theology

It is not difficult to see the importance of this doctrine on the common good for the science of theology. The goodness of God is the ultimate explanatory principle of all His works, both of nature and grace. Moreover, the whole of moral theology in particular begins and ends with a consideration of God as our beatitude. De Koninck makes clear that, for St. Thomas, the object of this beatitude is formally attained as a common good

(New York: Charles Scribner's Sons, 1947), pp.19–20.) Maritain applies the same principle later in the same work where he states: "The common good of the intellects can be understood in two ways: in the first way, it is truth and beauty themselves, through the enjoyment of which minds receive a certain natural irradiation or participation of the Uncreated Truth and Beauty or of the separated common good. This common good of the intellects is obviously superior to the personal act by which each intellect conquers a fragment of it; but it is not a social good, a common good in the strict sense." (Ibid., p.73).

²⁸It seems to me that the explanation for Maritain's particular reading of St. Thomas on this point stems from an approach to metaphysics which tends to ignore the role of essences and causality in favor of being. While, according to St. Thomas, being *qua* being is the subject-genus of metaphysics and while the distinction between *esse* and essence is fundamental for St. Thomas, there is much more to a science than its subject. Neither is being the most fundamental consideration for every metaphysical problem. Indeed, for St. Thomas metaphysics is first of all wisdom, and wisdom has to do with the first causes, especially the final cause since it is the first among causes. A metaphysical approach which restricts itself to the consideration of being and the *actus essendi*, which pertains properly to the consideration of formal causality, is impoverished precisely because it cannot account for the whole of reality, from pure act to pure potency.

in the line of final causality.²⁹ This explains why the theological virtue of charity necessarily has a social dimension: we are to love God precisely as He is communicable to others.

This doctrine on the common good also is crucial for formulating a correct understanding of the Church in relation to her members. The Church has as her principle of unity that very same good which is the beatitude of all her members. Unlike temporal societies, the end to which membership in the Church is ordained is our ultimate end. For this reason membership in the Church touches us even at the level of our conscience: the Church has from Christ an authority even in those areas most intimate to our persons. For this reason also, membership in the Church can never be coerced: all the children of the Church must be free.

The doctrine of the common good is so universal in its application that failure to understand the nature of the primacy

²⁹This is something that Fr. Eschmann failed to understand, and it resulted in serious errors. Fr. Eschmann, as De Koninck points out, has understood *bonum universale in causando* to refer only to causes in the line of efficient and exemplary causality, the causality by which God causes goodness in others. He failed to recognize or understand the many texts where St. Thomas shows that, most properly, *bonum universale in causando* refers to a common good in the line of final cause. As a consequence, Fr. Eschmann concludes that our participation in the divine goodness is not by way of final causality. Moreover, according to Fr. Eschmann, God is not formally a common good for beatified souls, but a private, personal good. But if this is so, the goodness of the beatified soul will be formally the same as God's goodness so that the divine goodness is wholly communicated to the beatified soul. That is to say, the beatified creature becomes as good as God Himself! And hence, it would be false to say that God should be loved more than the saints, or that we ought to love ourselves or the saints for God's sake. It is not difficult to see the harm which comes from such an error. Germain Grisez carries the consequences of this error further, arguing at one point that "strictly speaking, God is not the ultimate end toward which we should direct our lives." (Germaine Grisez, from *The Restless-Heart Blunder*, 2005 Aquinas Lecture, Center for Thomistic Studies, University of St. Thomas, Houston, Texas, p. 13.)

of the common good in relation to private goods in the same order can result in the obfuscation of even the clearest doctrines of the Church. When the private good of individual souls is held up as the ultimate good and end for which God acts, traditional doctrines like the existence of hell, the necessity for baptism or membership in the Church for salvation, and the doctrine of predestination become all but impossible to understand. According to this mistaken view, there is nothing better than the salvation of an individual soul, so that a loving God could never have a reason for permitting a soul to be lost. Hence, salvation is automatically assured no matter whether one keeps the commandments or not, is baptized or not, is a member of the Church or not. But if there is a common good of the elect which is a greater good than any individual's private salvation, and if this surpassing good is what God primarily loves and acts to bring about, all of these traditional doctrines of the Church make sense.

In a rather striking text illustrating this point, St. Thomas calls attention to an error by Origen in which he concluded that angels and human souls were the same in species:

Origen, wanting to avoid the errors of ancient heretics who had attributed the diversity of things to diverse principles introducing the diversity of good and evil, posited that the diversity of all things had proceeded from free will. For he said that God made all rational creatures equal from the beginning, and that some, by adhering to God, made progress in better things by way of their clinging to God; but certain others, receding from God by their own free will, fell into worse things, to the degree that they departed from God. And therefore, certain of them were incorporated into the heavenly bodies, certain others into human bodies, and certain others were perverted even to the wickedness of the demons. Nevertheless, all were uniform from their creation in the

beginning. But it can be seen how in respect to this position, Origen attended to the good of singular creatures, overlooking the consideration of the whole. Yet a wise architect not only considers the good of this part or that part in the disposition of the parts, but much more the good of the whole. Hence, a builder does not make all parts of the house equally precious, but more and less according as it befits the good disposition of the house.³⁰

It is not by accident that Origen also held that hell was not eternal. Both errors follow necessarily from the position that the ultimate good in the universe is the private good of the singular parts of the universe.

Conclusion

This brief survey of St. Thomas' teaching on the common good, a survey guided by Professor De Koninck, not only manifests that there are several analogous meanings of the expression "common good," but also manifests that there is a primary meaning which, though least known to us, has the fullest notion of common good. It is most perfectly common because it is communicable in the highest degree: to being as such. It most fully has the notion of goodness because it is most of all perfective, bringing the whole being of each thing to its perfection in the mode of an end. It is this primary meaning of the common good that has significance far beyond the boundaries of ethics or political science. It is a metaphysical concept of the greatest importance that even touches upon and is of greatest service in theology. For the object sought by the wise man in first philosophy is the first and most universal cause of all beings. And this cause is a good, a good that, precisely as common, is the highest beatitude of all rational creatures and the ultimate reason for being of all things.

³⁰*Disputed Questions on the Soul*, a.7, c.

THE GROUND AND PROPERTIES OF TIME

R. Glen Coughlin

Dedicated to the Memory of Marcus Berquist

Introduction

Having considered the way in which time exists and also having touched briefly on the nature of time,¹ I shall now attempt to show how the attributes of time follow from the nature of time. The properties I have in mind would generally be considered necessary attributes of time, though current physical theory calls into question some of them, or, perhaps more accurately, the way in which some of them are found in time. I hope that this discussion will also address some of the preliminaries to questions about time which arise from relativity, quantum mechanics, and cosmology.

Before going into the properties, however, I shall try to show the roots of time in the materiality of the mobile. This will

R. Glen Coughlin is a graduate of Thomas Aquinas College (1981). He completed his Ph.D. in Philosophy at Université Laval in 1986 and began teaching at Thomas Aquinas College in 1987. He served as Dean of the College from 1996 to 2004.

¹*The Existence and Nature of Time*, *The Aquinas Review*, Vol. 16, 2009, pp. 1–36. Hereafter, *ENT*.

allow us to see more deeply into the nature and properties of time. After this, I shall consider the properties of time. Here I will consider how time has parts, the continuity of time, the unity of the time of a motion, and the so-called “arrow of time.” These properties, I suggest, are to be understood in terms of the “material” element in the definition of time, namely, motion. These considerations will allow us to return to a question from our previous study, namely, whether the rational relation of before and after found in time is rooted in the real relations among the parts of magnitude or in the relation of a patient to an agent. After treating these questions, I shall consider the properties which seem to flow from the more formal aspect of time, that is, its being a number and a measure. Here we will consider the uniformity of time, the containment of motion, rest, and the mobile by time, and the simultaneity of time. In this last consideration, I will treat how certain motions can be simultaneous and then whether there is one time for all motions or not. Finally, I shall make a suggestion, based on the considerations of two different unities of time, concerning the possibility of a “first” motion, that is, a motion which is a first and natural measure of time for all things.

In this article, as in the previous one mentioned, I will proceed not from the experience and theory of modern science, but from the more rooted experience of immediate living. I do not, of course, deny that the conclusions I will reach may need to be nuanced by reference to modern science, but rather affirm the need to be clear on what is evident from an experience which is presupposed to the experience of the physicists, and also on the very abstract and insufficient character of the conclusions which can be attained without reference to the more particular forms of experience which modern science excels in explicating. The more nuanced understanding which modern science allows but does not itself provide sheds light on all the issues I will here take

up, as is most obvious in the case of the simultaneity of time, the unity of time, and the relations of space and time.

The First Natural Principle of Time is the First Matter

Time, as we say, is the number of motion, and since motion belongs to mobiles as such, the principles of mobiles are the ultimate principles of time. What, then, are these principles? That is, why can a mobile move? We know from the first book of Aristotle's *Physics* that the principles of motion are matter, form, and privation.² Are these (or some of these) also the principles of the mobile as such?

The principles of the mobile and those of motion are not simply the same because the mobile is a being, but motion is a becoming, and becoming is distinct from being, since it is rather the way to being. To become is to become a being, even if the being which becomes is as minimal as "being here." In those changes which lead to such non-substantial results, the mobile, which itself is a substance, is the "matter" of the motion while what results, the "terminus ad quem," is the "form." But in changes which do result in new substances, the mobile is not the matter, but is composed from an even more fundamental matter and form.³ Thus, there is a similarity between the principles of motion and of the mobile, though they are not simply identical. For the material principle of non-substantial changes (henceforth, "motions") is a being, namely the mobile, while the material principle of substantial change and of the mobile which comes to be by substantial change is not a being but is only a principle of a being.

Though the principles of the mobile and of its motion are not identical, the principles of the latter must be grounded in

²*Physics* I,7, 190b17–29. (Hereafter, *Phys.*)

³*Ibid.*, 190b10–17; 191a7–15.

those of the former: there must be something about its nature which permits or even demands motion. Let us look more carefully, then, at the principles of the mobile.

Because the mobile does not have some condition, be that a quality or a quantity or a place, which it is nevertheless *able* to have, it is a mobile. And since every ability is defined in terms of what it is an ability for, and we are speaking of an ability to be other, we should first look at the notion of otherness.

Now, there is more than one kind of otherness. A thing, in the sense of an Aristotelian substance, can be other in kind or in number from another thing. It can be merely another one, or another sort; it can differ by “which” or by “what.” One dog differs from another in number and a rock from a man in kind. During a change, a mobile goes from having one form to another, that is, undergoes a change in kind, whether accidental or substantial; nevertheless, otherness in number is presupposed to otherness in kind, since one thing cannot be two sorts of thing but two things can be one sort of thing. We shall shortly see another, more obviously pertinent reason to treat otherness in number first.

So what makes things other in number? How, fundamentally, do two dogs or two horses differ? They cannot differ in form since we are considering just that case in which things do not differ in what they are. And since differences which are not in the genus of substance depend on being in different substances,⁴ we cannot refer the otherness of substances which differ only in which one they are (“in number”) simply to such accidental differences as size or place, but must refer them to something

⁴St. Thomas Aquinas, *Summa Theologiae*, Ia, Q. 29, a. 1, c: “Substantia enim individuatur per seipsum, sed accidentia individuatur per subiectum, quod est substantia: dicitur enim haec albedo, in quantum est in hoc subiecti.” References to this work will hereafter be made exclusively by Part, Question, Article, and, when appropriate, Objection or Response.

prior to these accidents and therefore to something before substance but nevertheless in the genus substance. For example, the different instances of the same shade of whiteness in two pieces of paper cannot be the ultimate reason for the difference of the pieces of paper; rather, the difference in the whitenesses depends upon the fact that the pieces of paper are themselves different. What makes a thing be what it is (i.e., substantial form) having been excluded, we must trace the root of these differences to a principle which does not make the thing be what it is and yet is a principle of the substance as constituting it. Such a principle can only be a pure receiver of form, for it can lend no formal notion to the thing it is in, and yet, since it is a principle of the substance itself, it must be united to the formal principle before any accidents are found in it. It is this purely potential or formally blank principle which St. Thomas and the Aristotelian tradition call “prime matter.” This utterly formless principle is, it seems, the root of being other in number.⁵

We have here, though, two difficulties to deal with: first, we started by saying that the notion of otherness was before the notion of ability, but we seem now to be saying that ability or potency of prime matter is before otherness in substance; secondly, what has no formal notion, and therefore no distinctness or determination, cannot give rise to distinction or otherness.

The first question can be answered by noting that otherness is in the notion of potency but the reverse is not true. Having grasped being, the very first thing we grasp,⁶ we then grasp non-being by mere negation of being, and this grasp seems to involve no reference to an ability to become anything else. At first, we do not grasp non-being as able to be the original being; we simply grasp it as other. Being a simpler notion, otherness is,

⁵St. Thomas Aquinas, *In II Sent.*, D. 12, q. 3, a. 1, ad 3. (Hereafter, *In Sent.*)

⁶I-II, Q. 94, a. 2.

as we said earlier, prior in notion to potency or ability. Potency, on the other hand, is defined in terms of something it is for or towards, as the potency to be in Chicago is defined in terms of being in Chicago. But, in the first sense of the term at least, a thing is not in potency to the very thing it already is; potency implies privation of that to which the potential is potential. So potency implies otherness, but not vice-versa. Absolutely speaking, then, the notion of potency is after the notion of otherness.⁷ Nevertheless, in order actually to become other one must have the ability or potency to do so; thus, what can be other must have the ability to be other before it is other.

The second question raised above concerned the inability of ability to be the ultimate ground of otherness, and now we see more clearly that it is so in fact, since otherness or difference is before ability or potency in notion. But if so, then what is the otherness which is before ability? It must be an otherness which accounts for the otherness of substance, since this is an otherness presupposed to the otherness of accidents, as we saw earlier. But in two substances of the same kind, before accidents are understood to be in them, there is nothing but prime matter and form, the latter of which we are assuming to be the same in our substances of the same kind, and the former of which is the bare potency which gave rise to our problems to begin with. It seems that neither of these principles could account for differences of substances. So what does account for these differences?

⁷Another use of potency is compatible with act, as when we say someone must be able to stand because he is standing. Here, we think of the power or potency as fulfilled by the activity or act. In order to distinguish the act and the potency here, we must see them as other before we see them as compatible, and so see the one as not being the other. This is just what occurs when, without further qualification, we see the potency as other from the act and so as deprived of it, that is, when we grasp the first sense of potency. We can then go on to see that something which is originally deprived of an act can still be present when the act is present, and this perception leads us to the second sense of potency.

An answer is given by St. Thomas in several texts. In some, he is content to name matter as the principle of numerical difference.⁸ But this is not a complete answer, as should be clear from the difficulty we have raised. In fact, the principle from which he resolves the difficulty is simple and is actually the premise assumed in the question itself: Because pure potency has nothing of act in itself, it cannot by itself ground distinction. What does ground the distinction of substances must somehow have within itself distinction. Since we are speaking of things of the same sort, and what makes things the same can hardly be what makes them different, the difference cannot simply be due to the whatness of the things or to that which determines that whatness, i.e., their form. Nor can it be due to material simply speaking. But what else is there besides accidents? From these considerations arises the surprising conclusion to which St. Thomas is led: The differences of substance which are of the same sort are due to an accident, in particular, the accident of quantity.⁹ For quantity is the only thing which contains in its very notion otherness, being what is made of parts which are other from each other, what has part outside of part.¹⁰

How, though, can an accident, which depends on its subject to be and which, we said above, is therefore differentiated by being in a different subject, be instead the principle of the difference of those subjects? St. Thomas' solution seems to be hopelessly circular.

⁸E.g., Ia, Q. 39, a. 1, ad 3.

⁹St. Thomas Aquinas, *Expositio Super Librum Boethii de Trinitate*, ed. Bruno Decker (Leiden: E. J. Brill, 1959), Q. 4, a. 2 (hereafter, *In de Trin.*); cf. also *In II Sent.* D. 3, q. 1, a. 4–5; *In II Sent.* D. 12, q. 1, a. 1, esp. ad 3; *Summa Contra Gentiles* 4.65, nn. 5–7; Ia, Q. 76, a. 6, ad 2; *Phys.*, I.2, 185b16.

¹⁰*Ibid.*, esp. *In II Sent.* D. 12, q. 1, a. 1, ad 3 and *In de Trin.*, Q. 4, a. 2. Cf. also *Phys.* VI.1, 231b4–6 and *Metaphysics*, V.13, 1020a7–8. It may be well to note here immediately that the first sort of quantity in physical things is continuous, the discrete arising by the division of the continuous. Cf. *Phys.* III.6, 206b3–20.

As a beginning of an answer, note that because mere potency or prime matter cannot adequately account for difference (for reasons already given), the ultimate ground of distinction must be on the side of form. Further, since the difference between this substance and that precedes accidental differences, and since some formal principle of difference must be prior to any material principle of difference, substantial form must, in some way, be the ground of the difference between two substances, even the difference of those of the same kind.

How substantial form can do this is explained by St. Thomas in at least three places.¹¹ While the substantial form is one, it causes many perfections in the substance itself and does so in an orderly way. A thing cannot be sensitive if it is not living, though it can be living without being sensitive. Sensitivity depends on vegetative functions, at least to all appearances. Moreover, a thing cannot be vegetative if it is not a body. Corporeity is necessary for vegetative life, as well as for sensitive and rational life. The form of man, for example, though it is one, gives rise to an ordered series of perfections, ordered not in time but in being.¹² But first in this order, as our example suggests, is corporeity.¹³ Every substantial form which is united to matter is the form of a body. But body as such, which results from the substantial form of any material being, is what has dimension, and the dimension which is the hallmark of bodies is foundational with respect to all further perfections. Thus, the accident of dimension, though not itself a substantial form, is the first accident of material substantial forms. It is not, of course, accidental in the sense that it may or may not be present, but only in the sense that it is not itself substance. Consequently, where

¹¹Ia, q. 76, a. 4; *Questio Disputata de Anima*, a. 9; *In I Sent.* D. 8, q. 5, a. 2.

¹²Cf. *Categories*, Ch. 12, 14a26–35.

¹³*In Sent.* I, d. 8, q. 5, a. 2.

there is material being, there is dimension, and where there is dimension, there is part outside of part, i.e., distinction. The substantial form of a body is thus what originally gives rise to the distinction of individual bodies, since it is what gives rise to the only thing, quantity, which has in its notion otherness without distinction in kind.¹⁴

But St. Thomas frequently speaks of matter, not form, as the ground of individuation. How is this compatible with what I have just argued? It is true also that matter grounds individuation, but it does so as subject to substantial form insofar as substantial form gives rise, as to a property, to the accident of dimension. Thus St. Thomas says that the principle of individuation is matter under dimension.¹⁵ St. Thomas also speaks of quantity as being the “first property” of matter.¹⁶ If matter has no actuality, however, it can hardly give rise to a property.¹⁷ St. Thomas must be saying that quantity arises from matter as subject to the sort of form which is always adjoined to matter, namely, corporeal form, and arises from that matter in some way because of what belongs to it as matter, namely, as we have already argued, its potency. We see here the intimate unity of form and matter in composed being: as the two are co-principles of the composite, so are they co-principles of the properties of the composite, even if there are reasons to attribute this or that property more to one or the other of the principles.

Though quantity follows upon the form of corporeity in one way, it remains true that it is in another way more attributed to the matter. We can see this by considering that matter as

¹⁴Cf. note 8.

¹⁵Ibid.

¹⁶*In De Trin.* Q. 5, a. 3.

¹⁷*In De Trin.*, Q. 4, a. 2; *In I Sent.* D. 8, Q. 5, a. 2.

such is a potency for act or form, it has an “appetite” for form.¹⁸ Everything is ordered to its own perfection, and matter is perfected by form. This desire for form is not just for one form, however, but for many. When matter is under one form it is deprived of all others,¹⁹ and so has an order to them as being other and even incompatible perfections. This is true not only of substantial but even of accidental forms. But when, for example, a thing is able to be hotter, this potency can only be fulfilled by some agent moving the mobile toward greater heat. If this is going to happen in a natural way, there must be a natural agent acting, and that means another body, and so dimensions, by which bodies are distinct.

Furthermore, in order to act on mobiles, these agents must contact them, and so must in some way have the ability to touch them. But touching happens when the terms of two things coincide; the agent and the patient must therefore have terms which are together in place, and so each must have terms and be in place – both of which conditions require dimension.²⁰

Further, when a natural agent first starts to act on another, it must do so because it is now in a condition to do so whereas before it was not. Either the patient must have moved to the agent or the agent to the patient or both, or an impediment must

¹⁸Cf. St. Thomas Aquinas, *In Aristotelis Librum De Anima Commentarium*, ed. P. F. Angeli M. Pirotta, O.P., (Rome: Marietti, 1959), L. II, l. 11, n. 366 (hereafter, *In De Anima*); *Phys.* I.9, 192a13–25; St. Thomas Aquinas, *In Octo Libros Physicorum Aristotelis Expositio*, ed. P.M. Maggiolo, O.P., (Rome: Marietti, 1954), L. I, l. 15, nn. 134–8 (hereafter, *In Phys.*). Clearly we are here using “appetite” to mean only an ordering to what is perfective and good for a thing, and dropping the usual dependence of appetite on knowledge in the thing with the appetite. Ia, Q. 19, a. 1.

¹⁹Thomas Aquinas, *De Principiis Naturae*, in *Opuscula Philosophica* (Rome: Marietti, 1954) ed. Raymundi M. Spiazzi, O.P., c. 2, n. 349.

²⁰*Phys.* VI.1, 231a21–b6.

have been removed.²¹ Thus, locomotion and therefore dimension are presupposed to the fulfillment of such potencies.

Besides, locomotion itself can only occur if the mobile itself has some size, as Aristotle proves in the *Physics*.²² For it is dimension, and not just quantity, which is a principle of motion. For one thing, as Aristotle proves in the *Physics*, only what has magnitude can be in motion *per se*,²³ while indivisibles can only be in motion *per accidens*, in virtue of their subjects' having magnitude. The ultimate reason for this is that the mobile's potency must be actualized part by part. If it is not, there is finally no motion and so no mobile, strictly speaking. There would be no motion because what is able to move *per se* must be able to have an imperfect act.²⁴ In order for there to be motion *per se*, then, there needs to be the possibility of having a term imperfectly, but, in locomotion at least, this is only possible for a mobile which has size.²⁵ What does not have size can only be entirely in one spot or another, it cannot be partly there. The change from spot to spot of such an indivisible mobile would occur by "jumps" or "moves," not by that gradual change we call motion.

²¹*Phys.* VIII.7, 260a20–261a26.

²²*Phys.* VI.4, 234b10–20.

²³*Ibid.*

²⁴There are various sorts of imperfect act, but here we mean the expression in a particular way. We do not mean, for example, a state intermediate between the *terminus a quo* and the *terminus ad quem*, like tepidity relative to freezing and boiling water, nor even an imperfect act which may have an intrinsic order to a more perfect act, such as boyhood relative to manhood. In these cases, there is no notion that the act, just as act, is ordered to further act. Rather, in the first case, there is no such order at all, and in the second, there is an order, but the act is not the act of the potency to be man, imperfectly had, but the act of the ability to be a boy, perfectly had. As such, this act is not further ordered in the way motion is. (I assume here that by boyhood we do not mean some division of a motion to manhood, but rather a state intermediate between childhood and manhood.)

²⁵*Phys.* VI.4, 234b10–20.

That locomotion demands a mobile with size can also be seen by considering that motion is not so much a leaving as an arriving; that is, motion, as a becoming, is to be understood as ordered to being more than as ordered away from non-being or privation. To get out of a room, you have to choose a direction and a destination; you cannot leave without arriving somewhere, and while the two may be simultaneous, the latter is prior to the former in notion. Consequently, when a mobile moves, it must be going somewhere in particular. But because points cannot be next to each other,²⁶ there is no place for a point-mobile to be going first. If such a mobile did change places, it would have to immediately attain a place which was distant from the place it had been in, for there is never a point next to a point. As every two points have an infinity of other points between them, the mobile would have to somehow get to a further point without ever getting to any of the infinite number of points closer to it. Further, then, there would be no order in the motion. For, since every place other than the one the point-mobile is in would be separated from the *terminus a quo* by an infinity of points, the point-mobile would not be in immediate potency to any particular place, and so would have no reason to move to one place before another. On the other hand, if the mobile does have size, there is a “next” place for the mobile, namely, the one equal to the mobile and immediately contiguous to it.

These considerations allow us to understand more perfectly the claim that the potency of matter demands continuous quantity. For all the potencies of matter are fulfilled only by way of locomotion.²⁷

²⁶*Phys.* VI.1, 231b6–10.

²⁷It may be well to note here that we may have to qualify this somewhat if we discover that the expansion of space, which does not seem simply to be a locomotion but some sort of change of space or spacetime itself, turns out to be real possibility. So far as I can see, the arguments I have presented are compatible with this possibility.

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Thus, the appetite of matter for accidental forms presupposes dimensions. So too does the appetite for substantial forms. For if prime matter is to take on many forms in succession, then there must be not only many bodies, but bodies differing so as to interact and transform each other. If there are no other bodies around, mobiles and prime matter could not, by natural means at least, attain their perfections. But for there to be many bodies, there must be a part outside of part and therefore dimensions.

Matter, then, is the ultimate root of motion and time because, as subject to quantity, it gives rise to that otherness which allows a potency to be ordered to an act that it does not possess. Matter is both what is ordered to the other and what, by its first property of quantity, gives rise to that otherness. It is thus what is most removed from the absolute self-identity of God; it is what is most self-alienated and distended, being what it is by somehow being ordered to another.

Why Time Has Parts

Because material forms have contradictory differences, as a dog is alive but a stone inanimate, these forms cannot coexist in one matter but must come to matter without impinging on each other. They cannot be “together”; they must be “apart” or “spread out.” The first sense of this is, as we have seen, the spatial one, that is, the forms are apart from one another in a continuous space. This spatial separation arises first in material being and so is prior to time and temporal separation; it is presupposed to motion and so to time. But because when two things which have different and mutually active forms are in proximity, they interact and change each other, these spatially diverse mobiles will begin to move each other, giving rise to succession and the dispersion of forms not only in space but also in time.

More fundamentally, matter which is under one form does not have all its potency actualized by that form (which is why it can become something else), and so, to complete the fulfillment of its nature, it must come to have another form. What it cannot have all together it gains piecemeal, by succession. The previous form, being in some way opposed to the subsequent form, must leave when the latter arrives. Thus, the appetite of matter for form leads to succession.

While the second consideration is more basic, the first shows us how the desire of material for new form is fulfilled in the natural world. The presence of mutually opposed and mutually active forms in spatial proximity leads to the alteration of the accidents of bodies, which alteration, brought to fruition, is substantial change, the introduction of a new form to an old matter.²⁸ In the natural order of things, spatial proximity is at the root of action, and so of motion, and so of succession. The spatial division of mobiles, then, give rise to the temporal separation; i.e., the reason there is part outside of part without relative position is that there is part outside of part with relative position, i.e., place.²⁹

Why The Parts of Time are Continuous

Not only does the partedness of space give rise to the succession, but it gives rise to continuous succession, that is, time. The easiest way to see this is to remember what we recently showed, that a mobile must have size in order to move. But if it has size and it moves into a new place, the motion by which it does so will be continuous, that is, it will attain its new place by

²⁸Thomas Aquinas, *De Mixtione Elementorum ad Magistrum Philippum* in *Opuscula Philosophica* (Rome: Marietti, 1954) ed. Raymundi M. Spiazzi, O.P., c. 1, n. 432.

²⁹Cf. *Categories* 6, 4b20–22, 5a23–30.

passing through the intermediate, infinitely divisible space. If it were not, the motion would, like the motion of an indivisible, be a leap to a distant place, a leap by which it would never arrive at any of the intermediate places. But then, as in the case of the point-mobile, there would be no reason for the order of the parts of motion; instead the mobile would simply jump around randomly until it finally settled somewhere. The reality, however, is that the mobile, being divisible, comes to be partially in a new place and then, successively, more and more in the new place, until finally it is entirely there. As Aristotle proves, no “first part” of the mobile moves out of the original place of the whole mobile.³⁰ Because the mobile is continuous, then, so is the succession in its attainment of the term to which.

Moreover, because bodies are only able to affect each other when they have a certain proximity, as fire needs to be near the water to heat it, there must be locomotion for there to be other motions. But locomotions, as we have already seen, demand that mobiles have size and continuous succession, that is, time. Even substantial changes, which are not successive but sudden, are necessarily preceded by continuous changes, for, because substantial change naturally arises from the activity of the bodies *moving* each other, it is embedded in temporal succession.³¹ That there is a continuous, parceled-out reality, a quantity of some sort, called “time” is thus a result of the potency of matter for new forms.

The partedness of time, then, and the order of the parts of time follow from those of material dimension. It follows, further, that the continuity of time is grounded on the continuity of dimension. The before and after of the parts of space correspond to the before and after of the parts of time, and the way the parts

³⁰*Phys.* VI.5, 236a27–35.

³¹*Phys.* VIII.8, 263b9–26.

of space are disposed with regard to exteriority is thus the basis of the exteriority of the parts of time. But the way of exteriority is a continuous one. The mobile has parts which share boundaries with each other; consequently, when there is a motion over space, that motion is continuous, and so is the time.

The fact that time has part outside of part, i.e., is a quantity, and that it is a continuous quantity, both result, therefore, from the dimension which arises from the potency of matter.

The Unity of the Time of Each Motion

The continuity of motion leads directly to the unity of time. This claim is not about a unity of time for all motions, a shared time which measures every motion at once, but only about the time of each motion considered apart. Since each motion is continuous, the time of that motion is continuous, for the time is either the motion itself as numbered or another motion which has, in regard to its successive dispositions, a strict correspondence to the one in question, which latter is assumed to be continuous. In fact, the unity of the time of each motion is really just the unity of some particular motion under a different name, for one of the principal meanings of the word “one” is precisely the continuous.³² So for time to be continuous is for it to be one and for the time of one motion to be continuous is for that portion of time to be one. We have seen that the continuity of the time of a motion follows on that of the motion, and that of the motion on that of magnitude. The unity of the time of a single motion is, then, ultimately consequent on the unity of magnitude.

Nevertheless, it would be good to look not only at the remote foundation of the unity of time in the unity of space, but also at its more proximate foundation in the unity of motion

³²*Metaphysics* V.6, 1015b36–1016a17.

itself. Doing so may help illuminate the unity of time as well as the so-called “arrow of time,” i.e., the fact that time has a unique direction.

What, then, is the unity of motion? Aristotle points out that the factors we look at to judge the unity of motion are the unity of the mobile and the unities of the terms from which and to which.³³

That the mobile or the matter must be one is clear from the fact that motion is a becoming of a form in a matter and is a sort of form or act of the matter, though imperfect. As we have seen, forms in matter are diversified according to the matter. If the mobile were not one, the motion would not be one: the form which comes to be in one mobile, even if it were specifically the same as another form in another matter and arose by way of a specifically identical cause, etc., would still not be the same *one*.

That the terminus to which must be one is clear from the fact that motion is a becoming: to become tall is not to become learned because being tall is not being learned.³⁴

The consideration of the role of the term from which seems more subtle, though, because the same mobile can arrive at the same term from many different beginnings, yet these would not be motions the same in number or perhaps even in species. To attain a given point from the left or from the right is to come to be there in different ways. It is clear that the unity of the term from which, and even of the points along the path of motion, is important for the unity of motion – but why is this so?

Each point along the path corresponds to a division of the motion, a “momentum,” in the medieval sense. The mobile has each of these places in potency, any one of which places could serve as a term to which, since the mobile could stop there, and,

³³*Phys.* V.4, 227b3–228b11.

³⁴*Ibid.*

moreover, each such term is also a potential, or, more precisely, a virtual term “from which” for the rest of the motion – it is neither a fully actual term (unless the mobile halts) nor a simply potential term (since the mobile is undoubtedly there in some way as it goes along).³⁵ The terms from which, whether the actual one at the beginning of the motion or the virtual ones along the path of the motion, in a way specify the potency of the mobile because they give it a particular disposition relative to the ultimate term. A proof of this is that what we do to the mobile to get it to, or to prevent it from getting to, its ultimate term differs depending on where it starts and which path it takes. The terms from which, then, whether actual or potential, are also dispositions determining the mobile’s potency toward the term; they are principles because they determine the particular way the mobile is actualized. And since they are the ends of parts of the motion and the beginnings of other parts, they are also principles of the continuity and so of the unity of motion.³⁶ Thus, starting from different terms from which or taking different paths from the same such term both make the motion specifically different, and therefore, *a fortiori*, numerically different.

Aristotle points out that the unity of the time is also necessary for the unity of the motion.³⁷ If the time is interrupted, then the motion is not one, but two. For if there is a pause, there is rest in an intermediate state, and this rest distinguishes the motion into two parts because that rest is an actual term to which of the first motion and an actual term from which of the second

³⁵*Phys.* VI.8, 239a23–b4; VIII.8, 263a22–263b9.

³⁶This makes it obvious why one motion cannot be made of parts of different sorts, say an alteration followed by a locomotion. These cannot be one by continuity because there is no common boundary of the two motions, though they may take place in a continuous time, one motion ending when the other begins. Cf. *Phys.* V.4, 228a20–228b3.

³⁷*Phys.* V.4, 228b3–11.

motion. These two motions would have been parts of a whole motion if there had been no such pause. Thus, the motion is continuous if the time of the motion is continuous. Still, the continuity of the motion is really prior to the continuity of the time, since the latter is only the number of the former.

The unity of the time of one motion, then, arises from the unity of the mobile and of the form which comes to be in that mobile, as well as from the unity of the term from which of the motion and of the potential terms from which that are present in the mobile during the motion as dispositions of the mobile to the final term. These dispositions are what are counted when we count the nows of time, and their being common terms of the parts of the motion implies that they are likewise common terms of the parts of the time, since these are same *in re*. The continuity of time is necessary for the unity of a motion, then, as Aristotle says, because it is really the same as the continuity of that motion whose nows are being counted.

The Arrow of Time

One salient property of time which has occasioned much discussion in the twentieth and twenty-first centuries is the directionality or “arrow” of time.³⁸ The fact that the laws of classical physics, with one supposed exception, do not indicate such directionality has occasioned much comment, the assumption seeming to be that the laws ought to do so.³⁹ It is suggested, for example, that if we were to play backward a film of two billiard balls colliding, we would not find anything amiss, so that whether time goes one way or the other is indifferent to

³⁸Cf., for example, Ilya Prigogine and Isabelle Stengers, *Order Out of Chaos: Man's New Dialogue with Nature* (Bantam, New York, 1984); cf. also Sean Carroll, *From Eternity to Here: The Quest for The Ultimate Theory of Time*, (Pantheon, New York, NY, 2009).

³⁹Carroll, *op. cit.*, pp. 30–32.

the laws of physics. But some think there is an exception: the second law of thermodynamics, which states that entropy (very roughly, “disorderliness”) increases or remains the same in a closed system. For example, cream dissipates in a cup of coffee, increasing entropy because the separation of all the cream from all the coffee is more orderly than their being mixed. We would be very surprised if we saw the milk spontaneously jump back into the cream pitcher when we stirred the coffee again.⁴⁰ If we were watching this in a movie, we would feel sure the film was running backwards. Entropy tends to increase with time in a closed system (or remains constant, if the system is already at maximum entropy), so the increase in entropy seems to be an indicator of, or perhaps even a cause of, the direction of time.

But there are some curiosities about this position. First, the law only states that entropy tends to increase or stay the same within a closed system. If the system is already at maximum entropy, the law predicts, obviously, no more increase. But then what would determine the arrow of time in that situation? Or would time stand still?

Secondly, the law is, in its modern understanding at least, only a statistical law. Because there are more ways for a system to be disordered (there are virtually an infinite number of ways for the cream particles to be distributed in the coffee in a disorderly way) but few ways for it to be ordered (all the cream particles must all be separated from all the coffee particles or arranged in some geometrical pattern, etc.), the odds are that one of the disorderly arrangements will arise, supposing no input of energy from an organizing agent. Do we really think that the direction

⁴⁰Finally, entropy is not best defined in terms of disorder but in terms of the dispersal of energy or the number of arrangements of particles which give rise to a macroscopic state. Water and oil spontaneously separate after being mixed. Though this seems to be directly contrary to the example of cream and coffee, both cases involve increasing entropy. Cf. Carroll, *op. cit.*, pp. 164–166.

of time is based on a statistical probability? What could be the rational link between the likeliness of an outcome and the fact that the outcome is later than the input? It is future outcomes which are likely or unlikely, not unlikely or likely ones which are future. What will be will be, likely or not. Besides, whatever the conglomerate of particles does, each individual particle goes on its way into the future without regard to the others, except those it directly encounters, so that a statistical truth does not seem sufficient to account for any one particle's temporal state.

Thirdly, before the second law was ever conceived, even the least educated man knew that time has a unique direction. Do we think all men have an implicit understanding of that law? Or that the universal agreement about time's determinate direction was mere guesswork before that law was formulated? Neither position seems very convincing. This common sense idea of the uniqueness of the direction of time is so strong that even if we did see cream become unmixed from coffee, we would certainly not think time was reversing, but only that something very odd was happening in the normal direction of time.⁴¹

Finally, the thought that time is reversible seems to be based in some way on an overly simplified analogy to spatial

⁴¹This argument restricts the reversal of time to external phenomena; one might push the question by asking whether it is conceivable that even our mental processes reverse when time reverses, so that, at the moment when the cream ascends to the pitcher, we would not think it odd but think exactly what we thought when it was descending. But that thought was, "it is descending." Universal time reversal would be utterly undetectable, it seems. But our memories would be of the future understood by us as past, our expectation of the past understood by us as future, and our present the separation of two illusions. And still it would remain true, even if unknowably so, that the past would be *what is going to happen*, and the future *what has happened*. This is simply self-contradictory. It is no wonder, then, that most of those who ask these questions seem to be in no serious doubt about the answer; they are really wondering *why* time is not reversible and how that non-reversibility is embedded in the laws of physics, not whether it is non-reversible in fact.

dimensions. We can go one way or the other along a line because all the parts are there simultaneously: part AB is before part BC if we go from left to right, say, but BC before AB if we go the other way. But if one part existed when the other did not, we would not have that freedom. The representation of time by a line, a “t-axis,” all the parts of which exist at once, may seduce us into thinking it odd that time has a unique direction when other dimensions do not; if we do not focus on this image of time, if we instead think of time as it is, as flux, it seems inevitable that time has a unique direction. When we reduce time to dimension, we risk overlooking the fact that a unique order is built into the very notion of time.

If the second law is not responsible for the direction of time, what is? I suggest that the “direction” of time is just the “direction” of motion towards some term, whatever that term is. Motion is the act of the potential as such,⁴² and the potential as such is ordered to act as to a term. As we saw in the last section, the momenta or potential divisions of a motion play the role of act relative to the term from which and, relative to the term to which, of dispositions. The greater and greater difference of the momenta from the term from which and the greater and greater proximity to the term to which constitutes the order in motion, and, since time is the number of motion and is motion *in re*, time has a fixed direction just as motion does.

In fact, since time and motion are the same *in re*, if time reversed, the motion of which it is the number would have to reverse. What would this mean? It would mean that the mobile would, instead of proceeding to some act by way of the motion, retreat from act and proceed instead toward potency and privation. The becoming which is motion would be an unbecoming, a process of dissolution, and not *per accidens*. For every motion

⁴²*Phys.* I,9, 201a9–11.

is *per accidens* the destruction of the term from which – when a man goes from one room to another, he leaves the room he was in; when a person learns, he leaves ignorance or error behind. But the becoming is always the becoming of the term to which. Because the terms are incompatible, as we cannot be in two places at once or be both ignorant and learned about the same thing at the same time, we always leave something behind when we change in any way, but the leaving, though necessary, is not what defines the motion: motion is the becoming of the term to which, not the destruction of the term from which. The reverse of the motion from unshaped clay to a statue would not be the motion from the statue to the original shape considered as a positive attribute, but the reduction of the act to a potency for that act, *per se*.

The question of entropy, then, is not central here. When the cream becomes mixed, the distribution of the cream throughout the coffee is a new act for it; if the cream by some amazing fluke leapt back into the pitcher, being in the pitcher would be the new act for the cream. In either case, the act comes about through the motion, whether that act be good or bad for the mobile, whether or not the motion leaves things in a more or less orderly state, and whether or not that act is likely. The motion is a becoming of the terminal act, good or bad, orderly or disorderly, likely or unlikely.

This explanation of the arrow of time does not make knowledge of it the esoteric domain of the specialist and does not make it depend on statistical laws, nor does it depend on a false imagination of time; it depends only on the definitions of time and of motion themselves. Moreover, it explains why we all recognize the arrow of time: because we all recognize that motion is the becoming of a being.

A sign that the explanation offered is correct is this: even in Newtonian mechanics, the reversibility of physical laws

demands, in addition to the reversal of time as an independent variable, the reversal of the momenta of the mobiles, that is, of the signs of the momenta.⁴³ For if we only reversed the time in the description of a motion, the body might be again where it had been earlier, but the momentum would be oriented away from the term of the new, reversed motion. The motion and time would be out of joint: the reversal of time would bring the body back to where it started while the failure to reverse the momenta would leave the mobile with an impulse to its starting point (its old end point) instead of to its new term. The momentum gives the mobile its direction to the terminal act, and this direction must be in tune with the time, for it is its cause.⁴⁴

The intuition about the second law is not, however, just irrelevant here. Motion by its nature corrupts, since it bears away what is.⁴⁵ Because of this, Aristotle says that time corrupts. In commenting on this passage, St. Thomas says that time corrupts because it is the number of motion, and motion, speaking universally, takes away what is.⁴⁶ Both Aristotle and Aquinas note that there is really always some agent which produces change: when a man “dies of old age” there are always an infinity of causes

⁴³In this paragraph I will be using “momentum” in the Newtonian sense of a vector quantity, not merely to mean the division of a motion.

⁴⁴Cf. Carroll, *op. cit.*, 133–134. Carroll considers the time and the momentum reversals as separate conditions for the reversal of a process described by Newtonian mechanics. I have argued that while different *in ratio*, there is no real difference between the direction of time and that of motion. The difference *in ratio* is sufficient to account for time and momentum being different factors in mechanical equations. The reader should bear in mind that momentum in the Newtonian sense is not simply the division of a motion and that the argument presented above, to the effect that momentum (in the sense of a division of motion) is really responsible for time’s arrow, is applicable to any sort of motion, though it may be helpful to think of the issue first in terms of locomotion and Newtonian momentum.

⁴⁵*Phys.* IV.13, 222b16–27.

⁴⁶*Ibid.*; *In Phys.* L. IV, l. 22, n. 622.

chipping away at him, one of which finally does him in. Even in the face of this, they do not take back the claim that time corrupts. For time accompanies any and every motion, whereas the production of something integral and coherent, that is, orderly, requires a very particular agent, as the birth of a child requires parents but the death of a man can arise in innumerable ways.⁴⁷ Consequently, the many motions which occur do not conspire, for the most part, to produce anything good, and so the overall effect is accidental and incoherent. The moderns say the individual particles act more or less determinately, but the overall effect, in a closed system without an agent acting to organize it, is chaotic. This is very similar to Aristotle's position, and he would agree with the modern physicist that this is somehow tied up with time's direction. But for Aristotle, the ultimate ground of the arrow of time is the order of potency to act; the lack of an organizing principle in time itself is the reason that, as time goes forward, things fall apart.

The Before and After of Time Revisited

We saw earlier that the rational relation which is the before and after of time is either immediately founded on the real relation of the mobile to the agent of the motion or to the before and after of space.⁴⁸ In the present article, we have seen that matter gives rise to dimension as a necessary means to fulfill the appetite of matter for form, and that the before and after of time and its continuity follow from the before and after of motion and its continuity. Given that, for local motions at least, the parts of motion are ordered due to the order of the parts of space and give rise to the order of the parts of time, we can say that the before and after of time is founded upon the before and after of magnitude.

⁴⁷*In Phys.*, loc. cit.

⁴⁸*ENT*, pp. 23–28.

We have still to ask, however, whether the before and after of time and of motions other than local motions also depend upon the before and after of magnitude, and if so, how they do so.

We might consider this question in more than one way. First, we could take it to be a matter of experience that time is in fact continuous,⁴⁹ and note that continuity is only found *per se* in motions which have positions as their terms.⁵⁰ Since the time of any motion is continuous, but only these spatial motions are continuous *per se*, then time must be properly the number of such motions or such a motion, even when it is used to count the before and after of other sorts of motions. Consequently, the before and after of the time of every motion is based on the before and after of the time of locomotion, which is clearly based on the before and after of dimensions.

Secondly, we could ask whether the time of other, non-spatial, motions depends on the times of spatial motions because the former motions depend upon the latter. That they depend in some way on spatial motions was argued above.⁵¹ One argument in particular seems definitive. For bodies to move, they must be moved by another.⁵² But this demands proximity,⁵³ and

⁴⁹For an argument to this effect, cf. *Phys.* VI.2, 232b20–233a12.

⁵⁰*Phys.* VIII.7, 260b20–29.

⁵¹*Phys.* VIII.7, 260a26–261a28.

⁵²Aristotle argues for this principle at *Phys.* VII.1, 241b34–242a49 (in the other version of Book VII, this argument is at 241b24–242a15), at *Phys.* VIII.4, 254b7–256a3, and at *Phys.* VIII.5, 257b7–13. Even if one were to grant that there is inertial motion in the strict Newtonian sense, this would not affect the argument so far as we are concerned, since such motion obviously has its parts according to the parts of space.

⁵³For Aristotle, moving another demands contact, but even if we granted action at a distance, certain spatial relations are necessary for the interactions of bodies. In fact, laws of force involve a factor of relative distance; for example, gravitational force is inversely as the distance between the bodies gravitating. Cf. *Phys.* VII.2, 243a3–245b2 (in the alternative version of Book VII, 243a3–245b18); *Phys.* VIII.1, 251b1–10; *Phys.* VIII.7, 260a26–b5.

so localization. Thus, if there were a motion, an alteration for example, which was not itself defined in terms of dimensions or location, it would still presuppose such a motion, for it presupposes that the mover and the mobile are locally related so as to permit interaction.⁵⁴

But would such dependence imply anything at all about the time of the non-spatial motion itself? Suppose the motion in question is an alteration. The now at the beginning of the alteration would be determined by the coming to be of the appropriate arrangement of bodies, i.e., the arrangement which permits action and passion. If so, and if the alteration and its divisions are truly *after* the disposition which precedes the alteration, the now at the beginning of the alteration must also have a determinate relation to the nows of the altering mobile. Consequently, the nows which the arranged bodies continue to share must also be shared by the altering body, so that, at the least, the order of its nows correlates to the before and after of the arranged and locally moving bodies. Otherwise, there would be two simultaneous sets of nows, two times, one for the arranged bodies and one for the altering body. In short, if there is only one time for all these bodies and the before and after of some of them is determined by the before and after of space, then this is so for all of them, including the altering body.

One might add that though the intermediate time, the time during which the alteration is occurring, is less obviously determined as to its before and after by the before and after of some continuous quantity, it seems likely that the proximity required for the beginning of a motion also is required for its continuance. If the position of the agent relative to the patient is vital to the initiation of motion, and if that is because bodies work by contact or at least in virtue of some determinate spatial

⁵⁴Ibid.

relation, then the influence of the agent would be felt in a patient in different ways throughout the bulk of the patient. If so, then the before and after of the dimension of the body being altered would determine differences in the way the motion is received into the body, so that the dimensions of the altering body itself would provide a basis for the before and after in motion and time.

Finally, many thinkers say that alteration and even birth and death are merely the by-product of locomotions among elementary particles and, while this cannot simply be true, at least about birth and death (since it flies in the face of the experience of self-identity which we all have), it nevertheless seems outlandish to claim that there are no elementary particles, in any sense, within macroscopic bodies. And if elementary particles are there in some sense, then some sort of locomotion can presumably be attributed to them, and that locomotion would likely be best thought of as instrumental to or consequent upon alterations and substantial changes. Such non-spatial motions would thus also share in the continuity and before and after of spatial motions, and so the times which measure their duration might finally be explained, once again, by reference to the before and after of continuous quantity.

It seems that we ought to say, then, that the before and after of time and motion are rooted in the dimensions of space, and since all motions are in time, all motions in some way depend on a space which is the ground of their before and after. The possibility of the before and after of time and motion being rooted directly in the intention of an agent is not hereby excluded, but in merely natural motions such an appeal is premature.

R. Glen Coughlin

*Transition to the Consideration of the
More Formal Properties*

All of the properties of time we have looked at up to this point (the fact that it is a quantity and a continuous one, and that it is one for each motion, and that there is a before and after in a determinate order, and that the before and after of time follows upon the before and after of magnitude) have flowed from the fact that time is the same *in re* as motion. This is, as it were, the material side of time; we have now to look at what we might call the formal side, the fact that time is a number, or more generally, a measure of motion. Because numbering and measuring are acts of the mind, Aristotle argues that time cannot exist, at least not without qualification, if mind does not. Given this, we should expect that the remaining properties of time would in some way involve mind, though, as we saw in the previous article, this need not imply that these properties are merely subjective.⁵⁵ Furthermore, since form and matter are related as potency and act, which latter two form the most fundamental sort of one, we should not be too surprised to discover that our discussion of the formal properties of time is not independent of our previous considerations.

The Uniformity of Time

The first more formal property to look at is another sort of unity: the uniformity of time. As its name implies, this is a unity of form, while the continuity of time has more to do with a material unity.⁵⁶

⁵⁵ENT, pp. 22–23.

⁵⁶Cf. *In Phys.* L. III, l. 1, n. 277. St. Thomas speaks of the two definitions of the continuous, “what has parts the terms of which are one” and “what is infinitely divisible,” as formal and material, but as both have to do with composition of parts, they are both, in a sense, in material terms. Cf. also *Phys.* II.3, 195a18.

To say that time is uniform is to say that in some sense it has parts which are alike in form, not just meaning that they are the same kind of thing simply speaking (for it is assumed that they are all times), nor that they are the same shape (since the parts of time do not have shape), but that they nevertheless share some quality which deserves the name “form.”

What this could mean in the case of time is something we need to think about. When we say a line is uniform, we do mean to speak of shape: a straight line or a circle is “uniform” because all of its parts are alike in shape, a claim which we might test by superimposing one part on another. In contrast, the parts of a squiggle are not like this. The uniformity of a line is a likeness of quality in the parts of a quantitative whole.⁵⁷ We can label that property easily enough, calling it “shape,” a notion we seem to grasp immediately and which, though perhaps difficult to define, is not hard to recognize. When we speak of the uniformity of time, though, what quality are we thinking of? And what could correspond to the “superposition” of the parts of a line in the act of comparing them?

The last question has to be answered in terms of memory, since the parts of time pass away, and to compare them, we must bring them together in memory. This may lend an air of subjectivity to our comparisons in that we cannot, as we can with the parts of a line, compare things which are immediately before us, but we must ourselves reproduce something of the past to compare it to the present. What will be compared is therefore not simply the thing we wish to compare, for that is irretrievably lost, but some image of it, an “artifact of the mind,” as it were. This does not preclude certainty, though, anymore than we are always uncertain about whether a singer is keeping time or not, a judgment which also must involve some sort of memory of

⁵⁷*Categories*, Ch. 8, 10a11–16.

the lengths of time intervals in the past. Despite difficulties, we do manage to tell those who sing in time from those who do not. Some such comparison of memories is demanded when we ask whether time is uniform, but this will not make the exercise merely futile.

But what exactly do we wish to compare when we ask whether time is uniform? It seems clear that we are thinking of the rate of the passage of time. We wonder about the uniformity of time because sometimes time flies and other times it drags, or perhaps because the theory of relativity implies that different observers have different times. In these cases we seem to be wondering about the rate of time's passage. This seems reasonable also because time "flows," and its parts seem to be the before and after of that very flow.⁵⁸ The uniformity of time seems to be the uniformity of the flow of time.

In any case, it is difficult to see what else might be meant by "uniformity of time." The notion of the uniform, in general, demands a comparison of the parts of what is said to be uniform. But the parts of time have few predicates: they are successive; they are joined by *nows*, they are longer or shorter (as a second is shorter than a year); they are same *in re* with motion; they arise from the numbering of the before and after of motion. It does not seem possible to think of any of these aspects but succession being called "uniform." The only other possibility would seem to be the length of the times, as seconds and years, but here we would not speak of uniformity, but of equality, and if we asked whether, e.g., all seconds are equal, we would be back to the question of a sameness in the manner of succession.

Can we, then, make sense of the question "is time uniform" if we assume that this means "does time always flow at the

⁵⁸The before and after of time are not the same as the before and after of motion *in ratio*, even if they are the same *in re*. Cf. *ENT*, pp. 28–30.

same rate?" We can easily see that, for practical purposes, some measure of time will be assumed to be regular, whether that measure be the rotations of the earth or the vibrations of a cesium atom. But does not the very fact that we think some clocks are more accurate than others imply that there really is an ideal uniform time, whether instantiated in the world or merely imaginary, to which we compare all our clocks? The ancients may have supposed the revolution of the heavenly spheres to be perfectly regular, but more observation shows that the ratio between the time of revolution of the sun and the time of some other repeatable process, e.g., the time of a pendulum's swing, is not a constant. One or the other of the processes is not as uniform as it at first sight appears, one is more uniform than the other, and we choose the more uniform for our clock. Eventually, based on quantum mechanical theories, we have adopted the standard of the cesium atom "clock." The ratio of the duration of one period of the cesium atom's vibration to any other such vibration is more closely a ratio of one to one than is the ratio between the iterations of any other known periodic motion. Such advances cannot mask, but rather underline, the fundamental assumption that there is an ideally uniform time which we measure more and more perfectly with our various instruments.

All of which obviously begs the question: we are assuming that it is possible for the iterations to have or not to have the ratio of one to one *of times*. Every iteration, regardless of its duration, is an iteration, so of course we can correlate any iteration with some other; what is questionable is whether they each take the same amount of time, whether the flow of time during the iterations was the same. A clock is better or worse insofar as its iterations do or do not take the same amount of time. So, while we believe we make more and more accurate clocks and that this development has a real meaning, it seems we still have the question whether or how time itself is uniform - but how do

we judge the time itself to be uniform? It seems the notion of uniform time is circular.

Nevertheless, the very experience of judging that one singer keeps time better than another assumes some sort of standard, uniform time easily perceived by all. And all the great physicists have assumed a uniform time, even, in his way, Einstein. Newton describes his “absolute, true, and mathematical time” as “flowing equably without reference to anything external”;⁵⁹ Aristotle argues that time is not motion because every motion is fast or slow but time is not;⁶⁰ Einstein, though his theory leads to saying that different frames of reference can have different time measurements, still assumes that every observer’s time flows uniformly, at least from his own point of view.

In fact, we all seem to think that time is uniform, at least for ourselves. How could it not be? If time could speed up and slow down, would that not mean that it took some time more time to pass than some other time? Would we not be using a more basic time to measure the uniformity or its lack?

It seems that some notion of the uniformity of time is in any case inescapable, either self-evident or a sort of psychological necessity. The latter alternative is not out of court: given the role the mind plays in the perception and even, in a sense, the existence of time, it should come as no surprise that some aspects of time depend on the work of the mind.

That the uniformity of time is self-evident, on the other hand, may seem peculiar, for everyone seems to grant it in some way even if hardly anyone knows the definition of time – yet

⁵⁹Isaac Newton, *Mathematical Principles of Natural Philosophy*, Motte trans., revised by Florian Cajori (Los Angeles: University of California Press, 1962), Vol. I, Scholium to the Definitions, p. 6. (Hereafter, *Principia*.)

⁶⁰*Phys.* IV.10, 218b13–15. Aristotle does not so much say that time is uniform as that it is neither fast nor slow. Even uniform motion is fast or slow; it is just not changing in that regard. We shall return to this distinction shortly.

a self-evident statement is one in which one of the terms is included in the definition of the other.⁶¹

Noting the definition of time should, then, be our beginning: “the number of motion according to before and after.” A number being a measure, one sees easily that time must be at least considered uniform. For every measure as such must be uniform, since to measure, properly speaking, is to establish a numerical ratio between the measured and the unit of measure,⁶² which presupposes that the units are all alike. Every yard, for example, must be the same length if the statement, “a football field is 100 yards long,” is to mean anything. The units of the number with which we measure motion are all alike and any motion whose numbered parts we use as the time (or “number” or “measure”) of other motions cannot, insofar as we so use it, be anything but uniform. The measure is by definition, in other words, uniform, because a measure is that which we use as a unit to determine the quantity of something, and the units must be uniform to do this. The uniformity of time is therefore a self-evident property of time, a property following upon what is formal in the definition, “number.”

But what of Aristotle’s claim that time is neither fast nor slow, as opposed to saying it is uniform?⁶³ To the extent that time is used to measure the fast and the slow, or even to judge the uniformity of motion, it itself cannot be fast, slow, or uniform, at least not in the same sense as the measured motions are. Is it better, then, to say it is not subject to predicates of that sort at all?

Consider once again the yard. Is it long or short? In one sense it is neither; as a measure of length it is not itself measurable

⁶¹*Posterior Analytics* I.4, 73a34–b5.

⁶²*Metaphysics* X.1, 1052b20–1053b8.

⁶³Cf. note 59.

(except by switching measures) and so is neither long nor short. It is only long or short when judged against another measure, an inch or a mile, for example. As a unit, it cannot be long or short or variable. This is not to say it does not have length in any sense; for one thing, the measure and the measured must be homogeneous, and we are measuring length.⁶⁴ But to the extent that it is a unit of measurement it cannot be long or short or variable in its length.

So too, to the extent that time is a measure, it is neither fast nor slow. And its units must all be same if it is a measure, and so it is “uniform.” But it is not uniform in the sense that it is measured to be such, the way a uniform motion would be. Because we think of what is not fast or slow, though in flux, as uniform, we speak of time as uniform, but it is not so much uniform, i.e., of one form, as it is lacking form, i.e., lacking that extrinsic form imposed by being measured, just as a yardstick is not, just as such, measured by another and found to be variable or not. And as the yardstick has length in the sense of dimension, so time, which is motion *in re*, has a speed when considered in this more material way, i.e., as a particular motion which is used as a measure. So Aristotle can say that the motion of the outer sphere is the measure of others because it is quickest and most uniform,⁶⁵ even though its motion is time,⁶⁶ and as time, i.e., a kind of number, it is neither fast nor slow.⁶⁷ Whatever motion is used as time is therefore neither fast nor slow when considered formally as a number or measure, but is so when considered materially as a motion.

Thus, that time is uniform is a *per se notum* proposition because measure or number is in the definition of time. Since

⁶⁴*Metaphysics* X.1, 1052b20–1053b8.

⁶⁵*Metaphysics* X.1, 1053a8–12.

⁶⁶*Phys.* IV.11, 223a29–224a22.

⁶⁷*Phys.* IV.10, 218b13–15; IV.12, 220a32–b5.

time is a measure because the mind uses one motion to measure another motion, the uniformity of time follows from this act of the mind and not simply from the external reality of time.

For it is not necessary, so far as I can see, that there be a uniform motion *in rerum natura*. We simply use a motion which most closely approximates uniform motion as a measure of other motions, as we for centuries used the rotation of the earth as if it were regular and uniform. We nevertheless *understand* what uniform motion is simply by the denial of the differences of speed we see in non-uniform motion. Like other sorts of unity, uniformity presupposes a negation. “Equal,” for example, is the denial of the difference we see in quantities one of which exceeds the other.⁶⁸ Here uniformity is a denial of the differences of speed seen in the parts of accelerated motion. It is no more necessary that there be a strictly uniform motion in order to measure time than that there be a strictly straight and unchanging yardstick somewhere in order to measure length.

Time Contains Motion, Rest, and Mobiles

We have argued that time must be considered as having a sort of uniformity because that is a condition of being a measure; now we shall argue that motion, rest, and the mobile are all in time as a result of time’s being a measure.

It is a matter of common, universal knowledge that every motion is in time. The truth in question is a matter of perception: we none of us argue the proposition, but, observing or imagining motion, we observe or imagine time. Reflection on this unreflective experience may help us answer the further question, “What is it to be *in* time?” What is it that we notice when we recognize

⁶⁸Cf. St. Thomas Aquinas, *In Duodecim Libros Metaphysicorum Aristotelis Expositio*, ed. Raymundi M. Spiazzi, O.P., (Rome: Marietti, 1950) L. IV, l. 2, n. 561; L.V, l. 8, nn. 866–871. Hereafter, *In Meta*.

that motion is in time? Is it not the mere fact that one part of the motion is after another, that the parts are not together but successive? While the parts of space exist all at once, “side by side,” the parts of motion do not; they succeed each other such that when one is, the other is not. In making this comparison of parts, we are aware that the past parts of the motion are only in our memories and that future ones are only in expectation and that only some sliver or even division of motion is actually present before us, even in the case of imaginary motions. Nothing more than this flux is present to us when we judge that every motion is in time. That judgment must, therefore, be based on this primitive perception.

It seems that we do not imagine a paradigmatic uniform motion to which we compare the first motion in order to judge that it is in time. Even if we were to imagine a paradigmatic motion to which we might compare our original motion, we would have to judge that paradigmatic motion itself to be in time, if every motion is in time. Unless we grant not only the existence of an infinite regress but even that there is one present and that it is grasped in its entirety by us when we judge that every motion is in time, we must judge some motion to be in time without comparing it to another. Noting the parts of time is that very enumeration of motion which we have argued is time.⁶⁹ We easily see why everyone recognizes that every motion is in time.

Aristotle makes a somewhat surprising claim about this, though, namely, that to be in time is not to be when time is anymore than to be in place is to be when place is.⁷⁰ Clearly, in both cases the contained has to be simultaneous or together with the contained, but perhaps Aristotle is thinking that the notion

⁶⁹Cf. *Phys.* IV.11, 219a26–29.

⁷⁰*Phys.* IV.12, 221a9–26.

of containment implied by the word “in” is not identical with the notion of being “together.” Consider the Newtonian view of space:⁷¹ Whereas we think bodies are in space, and that to be in and to be out are opposed, the coincidence or togetherness of Newtonian space with bodies makes it impossible to say which is in which, since the dimensions of the space coincide with the dimensions of the bodies just as much as the dimensions of the bodies with those of the space. Coincidence is not containment, but mere togetherness. So too, to be in time is not merely to be when time is, for then the time would be in the motion in just the same way.

Rather, time and place are measures or determinants. For a motion to be in time is for the motion to be *measured* by time and being measured is not a symmetrical relation.⁷² Because time is the number of motion, motions are in time and time contains or determines motion. For the numbered is contained by the number and the measured by the measure.⁷³ “You have disposed all things in number, weight, and measure.”⁷⁴ So too, the time of a motion contains that motion, so that the motion is “in” time.⁷⁵ Here, to contain is to determine the quantity of, to delimit that quantity, as the parts of motion into which we divide the motion are a certain multitude and, recognized as such, they are a number and measure of motion, and so a container of motion.⁷⁶

⁷¹Cf. *Principia*, pp. 6–7.

⁷²*Phys.* IV.12, 220b32–221a7; 221a26.

⁷³Cf. *Phys.* IV.12, 220b32–221a26.

⁷⁴*Wisdom* 11:20.

⁷⁵Aristotle discusses some of the meanings of “in” at *Phys.* IV.3, 210a14–24. He does not treat every usage, evidently, but perhaps the principle ones. What seems to me common to all the uses is that what is “in” another is determined by it, as the placed is “in” place because it is determined in its relation to the universe and in its size by its place and the fate of the prisoner “in” the hands of the jury for analogous reasons.

⁷⁶*Phys.* IV.12, 221a7–26; *In Phys.* L. IV, l. 20, n. 602.

An issue arises here concerning time as a measure and container. If to be in time is to be measured by time, does the measure have to be other *in re* for the being in time to be real? This would seem to be implied by the word “in,” since nothing is in itself simply speaking but is always in something else.⁷⁷ Aristotle points out that we are in the world, but the world is not, properly speaking, in anything else; it is only “in” itself and that not as a whole but by way of its parts.⁷⁸ Moreover, we saw above that one thing is in another when the other determines it, but nothing determines itself, simply speaking. Does time also require a “container” to be really other from the “contained” in order for a motion to be “in” time strictly speaking?

It is obvious that this cannot in every case be so, for if it were, and every motion is in time, then we would have an infinite regress of simultaneous motions, or else there would be a first atemporal motion, contrary to the universal and certain judgment that all motions are in time. Besides, we originally saw that every motion is in time merely by looking at the successive parts of one motion.

But that *every* motion should differ only in *ratio* from its own measure seems dubious. For then no motion would be the measure of any other. But some are: the motion of the stopwatch measures the sprinter’s motion. In some cases, there seems even to be a natural and not merely a conventional reason that one motion measures the other: the motion of the sun measures our waking and sleeping; the rate of the revolution of a car’s engine measures and determines, along with other factors, the forward motion of the car. When we use another motion to measure a

⁷⁷*Phys.* IV.3, 210a25–b21.

⁷⁸*Phys.* IV.5, 212a31–b13. Here “in itself” may be taken merely negatively, to mean, “not in anything else.” The case is similar to saying “God is cause of himself,” by which we certainly cannot mean he really is his own cause (because then he would be both before and after himself) but only that he has no cause.

motion, there is an otherness to the measure. This, then, is being in time in the fullest sense, for the notion of “in” includes a certain otherness of the container, and the more fully that otherness is real, the more real is the containment and so the stricter is the use of “in.”

Thus, if there is a perfect existence of time, the difference between the motion whose number is time primarily and the motion which is being numbered by way of the former motion would be a real one, not just a rational one. The motion which does the measuring, on the other hand, if it were not itself measured, would differ only rationally from time and would then be in time only in a certain respect. This first time, this first motion would be the first measure of motions and, like other first measures, would not itself be measured simply speaking. It would be measured in a way, however, by way of what is posterior and also by the counting soul.

Having considered how motion is in time, we can readily see that its privation, rest, is also in time.⁷⁹ When a thing rests, it rests for some time, that is, a resting thing is in the same state at many moments. In order for there to be time, there must be motion somewhere, and we recognize rest when, while the “moving” mobile is in different conditions or positions at different moments, the “resting” one is not. This privation of otherness in what is able to be other is rest, and is measured by dividing some motion into parts and noting that the resting mobile is in the same condition or position at the various nows which determine the parts of the measuring motion. Since what rests is in the same condition or position in many nows, and the existence of many nows demands motion, nothing could rest if nothing were moving.⁸⁰

⁷⁹*Phys.* VI.8, 239a10–22; IV.12, 221b7–23.

⁸⁰*Phys.* VIII.1, 251b10–28.

Just as rest is in time due to a comparison of the disposition of what is resting to the dispositions of a moving body, so the motions which follow each other in different mobiles are in one continuous time due to the comparisons of the dispositions of the various mobiles to the dispositions of something else which is continuously moving. On what other ground could we attribute before and after in time to the consecutive motions if there were not some before and afters of motion for this use? But the before and afters of the consecutive motions are not, in fact, before and after each other except insofar as they are compared to some single motion, the divisions of which are before and after each other in an order of potency and act, as we saw earlier.⁸¹ In the absence of such a unified motion simultaneous with all other motions, the divisions of one motion would have no relation to the divisions of another, for the before and after of motion is a before and after of the actualization of the potency of the mobile, and, in the case before us, there is no relation between the various potencies of the two mobiles and their various acts.

The case of rest is even clearer, since the time of rest depends upon some mobile being in motion, as we just saw. Thus, if all motions and rests can be serially ordered, there must be one motion which goes on during the whole history of the universe. The only other option would seem to be a merely subjective before and after dependent upon our perceptions – but this would do away with any objective sequencing, and so with history and time itself. The unity of a single motion is necessary for the existence of an objectively continuous time.

Not only motion and rest, but the mobile too is measured by time, though not directly or in the privative way of rest: “It is clear that even for other things [i.e., other than motion] this is to

⁸¹Cf. “The Unity of the Time of Each Motion,” *supra*.

be in time, the being measured by time of their being.”⁸² When we measure a horse, we say it is so many “hands” high; when we measure the *being* of the horse, that is to say, its life,⁸³ we say it has lived or existed for so long. The being of things, their actuality, the distension of their essence, is through time and is measured by time; their essence is not. The “what” of a horse is not twenty years long; but this what, the one belonging to this particular horse, lasted twenty years, so long as it kept body and soul together.⁸⁴ This is what it is for composites to be: to have their matter and form united. Thus, since the union of matter and form is effected and dissolved in time, by way of motions, whether alterations or locomotions, composites of form and matter are limited both in their becoming and in their destruction by time, and are therefore measured by or in time.⁸⁵

This also agrees with a more modern understanding of substance, though the latter understanding would allow us to go even further. According to contemporary physics, the things we see around us are composed of molecules, atoms, and various sub-atomic particles. While these particles would seem

⁸²*Phys.* IV.12, 221a7–9.

⁸³“For living things, to be is to live.” *De Anima* II.4, 415b13; cf. also *In De Anima*, L. II, l. 7, n. 319.

⁸⁴Cf. St. Thomas Aquinas, *In I Sent.* D. 38, q. 1, a. 3, c.: “esse rei ex materia et forma compositae, a qua cognitionem accipit, consistit in quadam compositione formae ad materiam, vel accidentis ad subjectum”; *Quodl.* IX, q. 2, a. 2, c.: “Esse ergo proprie et vere non attribuitur nisi rei per se subsistenti. Huic autem attribuitur esse duplex. Unum scilicet esse resultans ex his ex quibus eius unitas integratur, quod proprium est esse suppositi substantiale.”

⁸⁵It is worth noting that this demands not some merely “factual” existence, but the act of existence which belongs to any particular thing as its most formal aspect. It is difficult to see that the “factual” existence of a thing is anything other than its having such an act, even if that act is not perceived clearly. That St. Thomas makes much more of the distinction of essence and existence than Aristotle does is manifestly true; that Aristotle was ignorant of the distinction altogether is manifestly false.

to have no independent existence (for otherwise those beings we are most sure are beings, such as ourselves and our friends would be nothing but accidental conglomerations⁸⁶), we cannot simply deny their existence at least as principles which could be separated, somewhat as our hands or feet are parts which have their nature from the whole but which can be separated from the whole, keeping in some ways their properties in doing so but losing their fundamental natures as human parts. Unlike earlier atomists, modern physicists hold that these particles are not hard little bodies but rather, among other oddities, have “wave-characteristics” such as frequency and wave-length. If this is correct, then mobiles have within their material constitution something which either is a motion or a characteristic of a motion; thus, these substances would be measured by time not due to a merely accidental motion but by one somehow involved in their very natures. These material beings we see around us, the materiality of which we ourselves share, would be what they are in some way by being in motion and so by distension not only through space but also through time. Their being is in time and measured by time because they are what they are in virtue of motion.

Simultaneity

But the containment of motions, rests, and mobiles by time demands a certain simultaneity.⁸⁷ For to be in time is to be measured by it, as we have seen, and to measure demands a coincidence of the measure with the measured, as we measure a table by placing a ruler along it and making the end points of the

⁸⁶The pre-Socratic atomist Democritus had already recognized this consequence of his view; cf. *Ancilla to the Pre-Socratic Philosophers*, trans. Kathleen Freeman (Oxford: Blackwell, 1962), p. 93 (Fragment 9).

⁸⁷These considerations will drive us back to the more material properties of place.

ruler coincide with certain positions on the table.⁸⁸ If the measuring time and the measured time are only different *in ratio*, there is no difficulty in seeing that there is a simultaneity of the measure and the measured, but when the difference is *in re* as well, there must exist a possibility that the now of one motion is numerically the same as the now of another.⁸⁹ For that the nows be same in kind is insufficient: even the disparate nows of one stretch of time seem to be same in kind, though they are not, evidently, simultaneous. And this is so even for time taken as an imaginary motion which we compare to one we see with our exterior senses, a subjective time, for even here, the powers of imagination and sensation must, though distinct, be operating in the numerically same now as the exterior motion. How is this simultaneity possible?

If time is the number of motion according to before and after, that is, the noting of the before and after in a motion, and if to be simultaneous is to share the numerically same now, that is, the numerically same before or after, then for two motions to be simultaneous, they must have the very same before and afters. But this seems absurd. How can you and I walk down the street together at the same time, if that means that the before and after of *my* motion has to be the very same as the before and after of *your* motion? Would that not mean that my successive positions are numerically the same as your successive positions? And, worse, that my motion *is* your motion? And I am you? But my motion is in me and yours is in you, as are my successive dispositions and yours. It seems that simultaneity is an absurd notion. For it to make sense, there must be a way for the very same numerical act to be the act of two separate mobiles at once.

⁸⁸There are more indirect ways of measuring, too, such as the measurement of an electric field by way of the acceleration of particles within, but all measurement is eventually by way of the coincidence of the measure and the measured.

⁸⁹*Phys.* IV.12, 220b5–12.

This cannot happen by the one act being in two subjects, since acts which are in distinct subjects are thereby distinct. But one act can be of two things if it is of them not as of subjects, or of one as of a subject and of the other in some other way. But what ways can an act be of something except as of a subject?

One way is by causality. If I push a book along a table, the before and after of the motion of the book is due to the motion of my hand, and, more pertinently, the one act which is the motion belongs to me as to a mover and to the book as to a mobile.⁹⁰ But I move the book by being in motion, and so the before and after of my motion causes the before and after in the motion of the book. Consequently, the book's before and after is also my before and after, being of the one as an agent and of the other as a subject.

This identity of the act of the agent and of the patient, just as agent and patient, seems to be tied up with the very notion of agency. "Hoc nomen principium ordinem quemdam importat; hoc vero nomen causa, importat influxam quemdam ad esse causati."⁹¹ There is, in agent causality, the "flowing" of the cause's act into the effect, the effect receiving into its own substance what belongs to the cause. For this reason, the cause is always simultaneous with the effect: "Simul enim dum movens movet, mobile movetur, *eo quod motus nihil est aliud quam actus mobilis a movente*, secundum quem movens dicitur movere et mobile moveri."⁹² When we think of an effect, we think of it as being in one thing, or being one thing, which is from another, the cause, as from a principle of its being or becoming. So the very

⁹⁰*Phys.* III.3, 212a13–21; 202a36–b22.

⁹¹*In Meta.* L. V, l. 1, n. 751.

⁹²St. Thomas Aquinas, *In Libros Posteriorum Analyticorum Expositio* in *In Aristotelis Libros Peri Hermeneias et Posterior Analyticorum Expositio*, ed. Raymond M. Spiazzi, O.P. (Rome: Marietti, 1955), L. II, l. 10, n. 505; cf. also *In Phys.* L. III, l. 5, n. 319.

idea of causation seems to demand that there be one act in one thing, which act truly belongs to another as to an author or origin. The idea of causation, and therefore of the mover, includes simultaneity.

I have argued that causality can provide simultaneity due to its very nature. We can go further, I think, to argue that *only* causality can provide a natural basis for simultaneity. The argument is based on the sufficiency of the division of the ten categories of Aristotle.⁹³ The first three of Aristotle's categories, "substance," "quality," and "quantity," do not have a reference to another built into their notion, so they do not name acts which are of another. The category of relation or "towards another" does clearly do so; in fact, that is its very notion, but the other to which the related thing is related is not the act of that which is so related, e.g., the double is related to another, the half, but the half is not the act of the double; nor is father the act of the son, nor left the act of right. Of the remaining categories, "position," "outfit," and "where" do imply relations and so do have some reference to another, but the act of the other again is not of the one related. Socrates is in the Lyceum, and so is related to it, but the Lyceum is not the act of Socrates; and so too in the other cases. The category of "when," if understood as involving a relation to a measure, does seem to involve, for the reasons we gave above, an act which is one for the measure and the measured – but this is the identity for which we seek a cause. In other words, the category of "when" presupposes the possibility of simultaneity; it does not explain it. Finally, "action" and "passion" do involve a numerically same disposition or act which belongs to two substances as being *in* one and *from* the other; these are the categories which are left, and they are the categories to which motion

⁹³Cf. Aristotle, *Categories*, Ch. 4, 1b25–2a4. On the sufficiency of Aristotle's division, cf. *In Phys.* L. III, l. 5, nn. 322; *In Meta.* L. V, l. 9, nn. 890–892.

is reduced in one sense.⁹⁴ It would seem, then, that not only does causality ground simultaneity, it is the only objective ground for simultaneity.

It is remarkable that Einstein's discussion of simultaneity seems to imply causality as well. Those events are simultaneous, he says, which are perceived at once by an observer situated half way between the events in question.⁹⁵ The events are simultaneous because both affect the observer at the same now and they are situated at equal distances from the observer, while the speed of light is stipulated to be the same for both directions. Though the point of the discussion of simultaneity is to define this idea in an empirically verifiable way for events at a distance, Einstein assumes that the impinging of the light beams on his eyes are simultaneous, and this, together with the stipulation about the speed of light, gives him the desired definition of simultaneity. He seems to assume that the light impinging on his eyes is simultaneous with its effects, namely, his act of seeing.

Simultaneity can exist if causality does, then, and it is clear that simultaneity does indeed exist. For there are certainly cases when one thing impinges on another, as when one ball hits another. In these cases, the effect in one ball is simultaneous with the agent causality of the other, for these are correlatives. If it is correct that *all* simultaneity is due to the causation of a single motion, then the question arises: is there in fact one time for the entire universe?

Is There is One Time for All Mobiles?

We have already discussed the case of the unity of the times of successive motions or rests, e.g., of whether there is one

⁹⁴*In Phys. L. III, l. 5, n. 324.*

⁹⁵Albert Einstein, *Relativity: The Special and General Theory* (New York: Random House, 1961), chs. 8–9, pp. 25–33.

time for two motions, one of which ends at 10:00 a.m. and the second of which begins at 10:15 a.m. We may call that the unity of the time of consecutive motions (or rests). We have seen that such a unity requires a single motion which continues so long as that unity continues unbroken. But is there one time for motions which are not serially or consecutively ordered? That is, is there one time for all the motions in the universe, a simultaneity for all things akin to the simultaneity which we saw above for causally interacting ones?

If there is one time for all things, then there must be a motion which is causally related to all non-consecutive motions, supposing, as I argued above, that the only ground of simultaneity is causality; if there is no such single time, then there need not be, indeed cannot be, one motion causally related to all non-consecutive motions.

One often hears that the removal of Aristotle's outer sphere from cosmology has removed the possibility of a first motion in the sense which we here intend, that is, a motion which is causally before all others and grounds the simultaneity of time for the entire universe. Perhaps wishing to retain the uniformity and universality of time without recourse to any such first motion and mobile, Newton proclaimed a time independent of all mobiles – but we have seen the shipwreck of that belief. Without either Aristotle's sphere or Newton's absolute time, we seem to be condemned to the relativism of time and a correspondent splintering of the universe.⁹⁶

One might try to avoid the whole problem by saying that our imaginations are tricking us into thinking that there must be one time for all motions just because we have to imagine things as in one time (and in one space) in order to compare them. Yet this cannot be a sufficient account: even when we compare two

⁹⁶Similar remarks can, of course, be made about place.

moments as before and after, we must think of them at the same time, and, in this case, at least, we do not for a moment think that the moments which are before or after are simultaneous. Because of the finite velocity of signals, we can both perceive two events simultaneously but recognize that the events themselves were not simultaneous, and also perceive two events non-simultaneously but recognize that the events themselves were simultaneous. In either case, we must think about the events simultaneously but we are not thereby constrained to think that they were simultaneous. The situation is a little like the one we find in speech about God: we say "God is simple," and, though the speech and our thought are themselves composed of a subject and a predicate, we are not by that fact confused into thinking that we are really denying his simplicity.⁹⁷ We are able to distinguish between what belongs to our manner of thinking and what is actually thought. So too, it is not convincing to say that we think of things as simultaneous simply because we imagine or perceive them at the same time.

There are also positive reasons to say that universal simultaneity is not merely a by-product of our human modes of imagining but is rather something we cannot even think otherwise about.

First, consider what would be implied by having more than one time. If two times existed, they obviously could not be simultaneous, nor could they be before or after each other. And if two times have no shared before and afters, they would be the counted before and afters, i.e., the counted dispositions, of two motions, dispositions which would stand in no relation to each other. How, then, would we speak of them? In so far as we know the two motions, we must compare them to our own lives; we must put them into some context relative to other events

⁹⁷Ia, Q. 13, a. 12.

in our lives, before some, after others. But then they would be in relation to each other as well, contrary to supposition. This argument does not assume or prove that simultaneity is merely subjective; rather, it assumes that we know the motions and that therefore our motions and the motions in question share a time. The only way to hold that the two motions in question are utterly unrelatable is to assume that we not only do not, but even cannot, know one or both of them. While this is not self-evidently absurd, it does seem an odd requirement for the motions to fulfill and makes of the position a sort of unimaginable fancy.

A stronger argument makes it more plausible still that all bodies are in fact in one time. Supposing that there is one space for all bodies, there would have to be at least a relation of distance between the bodies. Could this be sufficient to ground or at least imply temporal relations, or must there be something more? It seems it is sufficient: if there is a distance between things, they must be at the ends of that distance, otherwise the distance is not in act, but is only a potential length. But for a distance to exist, it must be all at once, i.e., the parts, and in particular the ends, must be simultaneous. So if there is one space, there must be one time. This seems to fit with at least one text of Aristotle. Speaking of the species of quantity in the *Categories*, he says that time and place differ in this way: that the parts of distance are all at once, whereas the parts of time are not.⁹⁸

Moreover, if time is the number of motion according to the before and after, which before and after depends upon the before and after of place, then the parts of place are before the parts of time and the parts of place are prior to temporal distinction, that is, they must be simultaneous at least in the sense that they do not exist in different nows. But they do exist in nows, for they cannot be simply outside the genus of things which are in

⁹⁸*Categories* 6, 4b20–22, 5a23–30.

time; we cannot say they are atemporal in the way, for example, God is, because we know by direct experience that they are each of them in time. The lack of temporal distinction, then, is not a mere negation but a privation, that is, simultaneity. The parts of space, then, must exist simultaneously.⁹⁹

Since the unity, that is, the continuity, of space implies the unity of time, our question reduces to whether or not there is indeed one space for all bodies in the universe. It is not very plausible that there could be bodies which have no spatial relation to the ones around us. Would they be nowhere? The “nowhere” of these bodies would have to be somewhere, but a somewhere having no spatial relation to the space of this universe. This would be an even more radical notion of alternative universes than is entertained in the multi-verse theory, itself an odd duck, for in that theory, the multiple universes constitute, at least historically, a unified whole, since the alternative universes broke off from each other at some place and time in the histories of each one of them, and so bodies in each of these universes do share a history, one not entirely knowable by observers in each other’s universes. If then, they share some portion of their history, they can in principle be compared to each other with regard to place and time, for each body in each universe has a determinate spatial and temporal relation to the place and time of bifurcation. The multiverse theory, in other words, does not utterly do away with the unities of space and time, but only makes it more indirect.

The same sort of argument, but a more evident one, can be made about light-cones in the theory of relativity. The view is that certain bodies are too far away and moving too fast for light to be received from them. But the assumption is that they *have* a

⁹⁹Once again, we see that there is cause to think of time and its properties as dependent on space and its properties.

distance from us, but one too great and increasing in a way that precludes interaction by light signals. It is not the case that such a theory claims utterly unrelated spaces.

Furthermore, we have argued that the dimensions of bodies arise from their material natures. The dimensions of bodies which share the same sort of matter, then, would be the same sorts of dimensions, and therefore have determinate spatial relations. But all bodies which can interact in any way have the same sort of matter: since one can affect the other, the agent must have what the patient can receive, so that they must both have a material able to have that form. Consequently, all bodies which ever shared a space and interacted must still share a space, so that neither the multi-verse nor the light-cones pose any fundamental difficulty to the view that the material cosmos contains but one space. But if so, then there is also one time for all things.

It is worth noting that even Einstein assumes implicitly a time which is common to all mobiles, and one which is not directly observable or subject to the test of his famous operational definition of simultaneity.¹⁰⁰ For he defines simultaneity operationally by way of the following “thought-experiment”: If an observer sits midway between two events and observes the light from the events at once, then, assuming that light has the same speed in each direction, we conclude that the events are simultaneous. But Einstein is assuming, as he explicitly says, that the light has the same speed in each direction, so he is assuming that the light beams are in fact travelling toward him *while* he sits waiting for them to arrive. This shared “now” is not the now which is defined as simultaneous but is assumed prior to it. If the events are judged not to be simultaneous, a similar argument would apply. Einstein’s position, then, seems to demand that there be a simultaneity which is not the one expressed by

¹⁰⁰Einstein, loc. cit.

his positivistic, operational definition, but is prior to it and is common to all things which can be judged using his definition to be either simultaneous or not – that is, to all things simply speaking.

Thus, it is not merely a demand of imagination, but even of reason, that mobiles be simultaneous even when not in causal contact, for they must, if they are parts of or located in the universe, be some distance apart, and being a distance apart demands the simultaneity of that which terminates the dimensions, in this case, the mobiles in question.

Is this claim, that the simultaneity of real motions and bodies is evident from the wholeness of the distances between the bodies, compatible with the claim made above that the only ground of simultaneity is the causality of a first mobile, at least if we do not have immediate recourse to a supernatural agent? First of all, it does not *contradict* that claim. Secondly, what seems to be shown by the argument is that the unity of time for two mobiles is connected somehow to the unity of space for two mobiles, otherwise we could not make an argument from the one to the other. Moreover, matter gives rise, as we saw above, to dimension first of all, and by way of dimension to the fulfillment of its desire for form, which occurs by way of motion, the measure of which is time. So it seems reasonable that there be a connection between the unity of dimension and the unity of time.

Perhaps, then, the argument points us further down our path as well. Perhaps we now should suspect that there is a mobility of dimension itself, that the simultaneity of the parts of a dimension point to the existence of a mover affecting the parts of the dimension so as to make their before and after one and the same. Such a position might be compatible with the notion of the expansion of space-time and the consequent expansion

of the universe. It would be in this context that we would consider more carefully the idea of spacetime cones. But this is well beyond the scope of this paper.

What is The First Motion?

We have seen two reasons from natural philosophy for affirming the existence of a first motion: first, that the unity of times of non-simultaneous motions and rests, i.e., the fact that time is continuous from day to day and year to year, presupposes a single motion the before and after of which is counted as time; second, that the numerical unity of simultaneous nows, and so of times, itself required by the unity of space, presupposes a single causal motion for all things.¹⁰¹

Now, everyone knows that the Newtonian world-view eclipsed the Aristotelian, with the latter's outer sphere and consequent fixed place, and universal, uniform time, only itself to be overcome by the revolutions of Einstein and quantum mechanics. The latter are works in progress but, so far as I can tell, one thing has remained constant for some time now, at least since LaMaitre and Hubble: the notion that the universe is expanding. This expansion is understood not to be the removal of stars, or galaxies, or indeed any other bodies from each other's vicinities, but rather an expansion of the very space between bodies. Leaving aside the question of whether or how this is intelligible, let me suggest that this expansion has at least some of the earmarks of the first motion.

It is universal. That is, every motion in the universe would be in immediate contact with an expansion of the universe,

¹⁰¹It is worth remarking that the first of these arguments is the only one explicitly considered by Aristotle in the *Physics* (cf. *Phys.* IV.14, 223a29–224a17), whereas St. Thomas explicitly refers to both approaches (cf. *In Phys.* L. IV, l. l. 23, n. 636).

supposing that it can be conceived of as a single motion. Moreover, it is a cause of the mobility of all mobiles, if it is somehow responsible for the location of things in space and time. Thirdly, it is a motion which regards dimension, certain aspects of which are tied into the properties of time, e.g., continuity, unity, containment of motion and the mobile, and simultaneity. It is also a single continuous motion which exists so long as the universe exists and so can provide the basis for the unity of times of non-simultaneous motions and rests. And we saw that simultaneity may be established both by dimensional relation and by causality; the expansion of spacetime would unite these two considerations.

While it is not possible to be certain of these sorts of judgments, it does seem reasonable to investigate whether the expansion of the universe should be considered a first, causal motion providing universal space and time for physical bodies, even if those unities turn out to be somehow defective relative to the original, rather idealized conceptions provided by the Aristotelian sphere.

Conclusion

Having reviewed the existence, nature, grounds, and properties of time, we are now in a better position either to ascend and discuss the nature of eternity or to descend and discuss the particulars of the way time is found concretely in the universe. Both of these projects are beyond the scope of this paper, though I hope I have provided a solid basis for such investigations.

I also hope that I have given a sort of case study of the fruitfulness of natural philosophy for the investigation of nature. However general and incomplete the discussion of nature from the point of view of common experience may be, it has a stability not matched by modern science, however much more useful and

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detailed the latter is. This is by no means a call to ignore modern science (which is hardly in need of more defenders at any rate); rather it is a call to reflect on the natural world using the more certain approach exemplified in the *Physics*, and, I hope, in these pages.

**WITHOUT ARISTOTLE’S SUN, ARE THERE ANY
EQUIVOCAL CAUSES BESIDES GOD?**

Christopher A. DeCaen

Near the beginning of the *Summa Theologiae*, in Question Four, on the perfection of God, St. Thomas Aquinas draws a distinction between the sort of agent causality that is most familiar to us and a sort that is less familiar but, he argues, far more fundamental:

Whatever there is of perfection within an effect must be found within the efficient cause, either according to the same account [*secundum eandem rationem*], if it is a univocal agent (for example, a man generates a man), or in a more eminent way [*eminentiori modo*], if it is an equivocal agent (for example, in the sun there is a likeness of those things that are generated through the power of the sun).¹

In the second case, the agent has the form it gives, but in an equivocal way, such that although father and son are univocally called “man,” no such univocal name can be given to the equivocal agent and its effect. When the spring sun quickens

Christopher DeCaen is a graduate of Thomas Aquinas College (1993). He received his doctorate in philosophy from the Catholic University of America in Washington, D.C., and has been a tutor at Thomas Aquinas College since 1999.

¹*STh* I, q. 4, a. 2. See also *Q. D. de Malo*, q. 1, a. 3. c.

plants so that seedlings sprout and flowers bloom, one cannot call the sun a sprout, or a bloomer, or alive even in the ancient cosmology—at least not without equivocating in some way, i.e., not without introducing an extended use of the word “alive.”

St. Thomas uses this distinction here to demonstrate that God is an equivocal agent, and that he therefore possesses within himself the perfections of all created things, albeit in a more eminent mode. This distinction between univocal and equivocal agency, although somewhat obscure, is not rare; St. Thomas employs it well over a dozen times in the *Prima Pars* alone, and in matters that pertain not only to sacred theology but also to metaphysics and natural philosophy. Indeed, provided that one already knows that universal causality is either the same thing as or a kind of equivocal causality—I will return to this—one will find St. Thomas applying the distinction still more widely, most especially in revealed theology. In fact, you can find it employed in every part of the *Summa*. Thus, not only does he argue in the *Prima Pars* that God, and even God’s will, is the universal cause of all that is, but in the *Tertia Pars* St. Thomas argues that the incarnate Son of God, and specifically his passion, is the universal cause of salvation. Likewise, in the *Secunda Secundae* he explains that just as the general virtue known as “legal justice” is a universal cause of the acts of the other moral virtues (insofar as it orders them to the common good), so too the theological virtue of charity is the universal cause of all virtuous acts (insofar as it orders them to the divine good). In the *Prima Secundae* he even speaks of the vice of arrogance as a quasi-universal cause of the other vices.² According to St. Thomas, then, the notion

²On God’s universal causality, see *STh* I, q. 19, a. 6; q. 45, a. 5; and q. 49, a. 3, etc.; on his will in particular, see I, q. 19, a. 6 and 7; on Christ’s passion, see *STh* III, q. 4, a. 4, ad 1; q. 7, a. 11; and q. 52, a. 1, ad 2. On legal justice and charity, see *STh* II-II, q. 58, a. 6. On arrogance as a universal cause of vices, see *STh* II-II, q. 162, a. 2; he also makes a brief comment about prudence as a universal cause of moral acts at I, q. 55, a. 3, ad 3.

of universal and equivocal agency is of great import for understanding God's agency, and sacred theology as a whole.

Given the prevalence of the distinction, however, one naturally wonders at the *necessity* for it. *Why* must there be, in addition to univocal agents, other agents that educe the form in the patient, yet without possessing it in advance in the same way that it is given? Indeed, how are we to understand, much less recognize, this so-called "more eminent" manner of possession in the equivocal agent?

The obscurity of this "more eminent" mode, combined with the fact that *manuductio* is all the more critical in matters that are not as readily accessible to us, renders St. Thomas's choice of examples here all the more important. But here, there's another hurdle: As we have just seen, St. Thomas frequently uses the sun generating things here below as a model equivocal agent. Sometimes he articulates this example in terms of the sun's occasional causing of spontaneous generation in putrefying matter, and at other times the sun's seasonal generation of plants from the earth in the spring, or even its daily warming of the earth year round. But in all these cases, his understanding of the sun's agency is based on the now refuted Aristotelian theory of the stars and planets as immortal substances naturally possessed of a higher sort of causality exerted on sublunary matter. If the Aristotelian sun is the only clear case of an equivocal agent besides the very one on which St. Thomas is trying to shed light, namely God, then the obsolescence of that sun seems, if not to undermine, at least to impair the reader's grasp of the idea of equivocal agency.

Fortunately, the situation is not so dire. Although the sun is indeed his go-to illustration of equivocal agency, St. Thomas offers several other significantly less problematic ones. This paper, then, will have three principal objectives: First, I will give a selection of these other examples. Second, I will use

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these examples to shed light on the so-called more eminent way the equivocal agent has the form it brings forth in the patient. And third, having made the idea of equivocal causality somewhat more intelligible, I will give, over and above these examples themselves, what I take to be the most decisive argument that there must be equivocal agents. In the course of reaching these objectives, I will point out a connection between equivocal agency and two other sorts of agency, namely, instrumental and universal agent causality.

The first set of examples is drawn from St. Thomas's commentary on the *Sentences*, in the context of speculations about the souls of the damned. This text is particularly interesting because it proposes a distinction among sorts of equivocal causality:

The likeness of the agent is in the patient in two ways: in one way, through the same mode in which it is in the agent, as it is in all univocal agents (e.g., the hot makes a thing hot, and a fire generates a fire); in another way, through a mode diverse from the mode in which it is in the agent, as it is in all equivocal agents. In these, however, sometimes it happens that the form that is received in the patient materially is in the agent spiritually (e.g., the form that is in a house made through art is within itself materially, and it is in the mind of the artisan spiritually); but sometimes, conversely, it is materially in the agent, and it is received spiritually in the patient (e.g., whiteness is materially in the wall, from which it is received spiritually in the pupil, and even in the medium carrying [*medio deferente*] the whiteness to the pupil).³

Here we gather two (or in a way three) examples of equivocal agency: the artisan causing the artifact, the color in the

³*Sent.* IV, d. 44, q. 3, a. 1, q1a. 3, ad 2.

object causing its species to be impressed into the transparent medium between itself and the eye, and then even to the eye. One does not call the architect a house, nor the species of white received into the eye (or the transparent air) white, at least not without equivocating.

But there the likeness stops and the distinction St. Thomas notes can become almost a source of paradox. The first case is straightforward: The agent possesses the form in a higher way than does the patient—that is, cognitively, in the practical intellect; the plan of the house in the builder’s mind is the form in virtue of which he makes the lumber into a house. In the other case, however, the opposite seems to happen: The lower seems to cause the higher, for the equivocal agent (the white wall) seems to possess the form of the effect in an inferior way than it is received in either patient (the eye or the air), since both receive it spiritually. How, then, can we in this case think of this equivocal agent as having the form in a “more eminent way”? I will return to this question later, after looking at two other examples, and the relation between equivocal causes and instrumental ones.

Following Aristotle’s consideration of kinds of likeness between the agent and the patient in *Metaphysics* VII, St. Thomas, in his commentary, offers several other examples of equivocal agency. I will note two of them. First, he describes equivocal causality here by saying that sometimes

the generated thing’s whole form itself does not precede in the generator, but a certain part of it, or a certain part of a part, does; for example, the heat that is a part of health, or is something leading to a part of health, precedes within the hot medicine. And this generation is in no way univocal.⁴

⁴In *VII Metaphys.*, lect. 8, par. 1446.

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As he describes it here, in equivocal causality the form received is not present as an integral whole in the agent, and so is not nameable univocally with its effect, although some part or aspect of the form shared by both might be. Thus, hot medicine can be a *per se* cause of curing an illness, but the health induced thereby is not present in the medicine itself in any univocal way; we do call medicine “healthy,” but only by way of analogy. The heat of the medicine, however, might induce a heating of the body that leads to, or is even partly constitutive of health, and “hot” seems to be said univocally here. Still, the proper action under consideration is not that of the hot causing the hot (which, of course, would be univocal causality), but of a drug or a drink (which itself has an essential element of heat) healing a man.

Notice for a moment how the examples of the architect from the *Sentences* commentary and the medicine from the *Metaphysics* commentary might at first glance seem the same. The architect is an artist, after all, as is the physician. But St. Thomas is singling out here not so much the physician, as the means the physician uses to bring about health. So whereas the physician would indeed be an equivocal agent in the same way that the architect is, the medicine the physician employs is another, albeit instrumental, equivocal agent as well. Noticing this can be helpful when we consider the last example I will introduce.

As he goes on in the *Metaphysics* passage, Aristotle then applies the idea of equivocal causality to natural generation, lest one think equivocal causality is peculiar to art. The first example Aristotle gives, the only one we will consider, pertains to the generation of animals from seed, which he compares to the example of the artisan. St. Thomas summarizes the likeness as follows:

A seed works toward a generation just as do those things
that come to be through an art. For just as the architect

is not actually a house, nor does he have the form that is the house in act, but in his capacity [*potestate*], so too the seed is not the animal in act, nor does it have the soul that is the animal's form in act, but in its capacity alone. For in this way there is within the seed a formative power that is related to the matter of conception [*ad materiam concepti*] just as the form of the house in the mind of the artisan is related to the stones and lumber—except that the form of the art is wholly external to the stones and lumber whereas the power of the seed is intrinsic [to the matter of conception].⁵

Note first of all that St. Thomas seems to employ two ways of speaking about the form as it exists in the equivocal agent: While elsewhere he implies that it is there in act, but in a higher way, here he says it is not there in act, but in the agent's capacity. There is no contradiction here: Taking the name of the effect univocally, it is of course not actually in the equivocal agent, but taking it equivocally, it is.

St. Thomas sheds some light on this “presence by capacity” by noting something similar to what he said in the *Sentences* commentary: The architect has the form of the house “not indeed according to the same mode of being [*modum essendi*]” as does the house itself, that is, “not according to a material existence [*esse materiale*], but according to the immaterial existence [*esse immateriale*] that it has in the mind of the artisan.” Thus, he says, in a way “this generation is partly due to something univocal, with respect to the form, but partly due to something equivocal, with respect to the existence of the form in the subject.”⁶ Thus, the builder is related to the materials from which he will build in the same way that the parent animal's seed is related to

⁵Ibid., par. 1451.

⁶Ibid., par. 1445.

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the matter disposed to become a new life. Yet, just as the mode of existence of the house-form in the builder's mind is distinct from the mode of existence in the building materials when the house is finished, so too the animal's seed possesses the form it will educe from the disposed matter in the womb in a different mode than does the newly conceived animal. The architect is not a house (though in a way his art is), and the animal-seed is not an animal (though in a way its power is), so like comes from like here in an equivocal way.

Let me summarize. We now have four or five alternatives to Aristotle's life-begetting sun. To list them: 1) An artist is an equivocal cause of an artifact; 2) a visible object is an equivocal cause of its intentional likeness in the transparent medium, and 3) then in the eye; 4) medicine is an equivocal cause of a healthy animal; and 5) the seed is an equivocal cause of the animal itself. St. Thomas and Aristotle give others, but these are enough grist for our mill. From them we can get a certain concretion about what it takes to count as an equivocal agent, and we can even notice certain patterns. In particular, note that some of these examples—namely, the seed of the animal and the medicine of the health—are the sorts of things typically described as instrumental causes.

St. Thomas himself seems to note this connection with instrumental agency as he continues to elaborate on the seed example. For he immediately points out a significant distinction between the artist and the seed:

However, although animal generation from seed is not from the seed as from a univocal agent (since the seed is not an animal), nevertheless *that from which* the seed is generated is in a certain way univocal with that which comes to be from the seed. For the seed comes to be from an animal. And in this there is a dissimilarity between natural generation and artificial generation, since it is

not necessary that the form of the house in the mind of the artisan is due to a [different] house—although sometimes this happens, as when someone makes a new house according to the model of another. But it is *always* necessary that a seed be from an animal.⁷

An animal seed is always an intermediary that an animal is using to generate another of its kind, and as such not only is an animal the seed's effect, but an animal is the seed's own cause: Like many (but perhaps not all) instrumental agents, a seed holds an agency that is essentially between things named univocally.⁸ The architect is not: He can invent the form of a house even without any experience of another house—the ability to invent is, after all, part of what it is to have an *art*. Thus, the artist is more of a principal cause than is the seed. The parent animal is trying to generate not seed but another animal. This reliance upon and reduction to univocal agents, however, suggests that instrumental causes—or at least some of them—are equivocal agents in a secondary sense, since it indicates that, unlike the artist and the white wall, the instrumental equivocal agent is less fundamentally the agent at work than is the univocal one.

Now, it might be tempting at this point to conclude that instrumental agency is a *species* of equivocal agency. After all, it does not seem that anything we usually call an instrumental cause generates as a univocal cause, since it does not usually make its like. The name of its effect is not univocally said of it:

⁷Ibid., par. 1452.

⁸I do not mean to say this is true of instrumental causes *generally*: A carpenter uses a saw not to make carpenters but furniture. It is true of several kinds of instrumental causes, though: The knower uses words to make another knower; Christ uses the sacraments to bring us into the body of Christ; fire heats the air to ignite the wood. But more importantly, whenever the intermediate cause brings about an effect univocal with the principal agent, the intermediate is an instrumental cause.

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For example, saws cut wood and don't turn it into another saw, and chalk puts writing on the board without turning the board into chalk.

However, St. Thomas does not seem to think that to be an instrumental cause is a specific way of being an equivocal cause; in fact, in some places he takes pains to separate equivocal and instrumental causality. Thus, in the *Sentences* commentary, he says:

The agent is twofold: one principal and another instrumental. A principal agent, however, when it effects a thing like itself, must have the form that it induces through its action (in univocal agents) or some more noble form (in non-univocal agents). But an instrumental agent need not possess the form that it induces as disposing that very thing [*ut disponentem ipsum*], except only through the mode of intention, as is clear of the form of the bench in the saw.⁹

Thus, St. Thomas is not only not conceiving of instrumental causes here as species of equivocal agents, but he is also saying that equivocal agents have more in common with univocal ones than with instrumental ones. Among agents the instrumental cause is in a class all its own—indeed, in a lower class when compared to univocal and equivocal causes, which are species of principal agents. Whereas the equivocal agent possesses the form through a nobler form, its own substantial form, than does the effect, and a univocal agent possesses that form in the same way as does the effect, the instrumental agent possesses it in a lower, “intentional” way.

⁹*Sent.* IV, d. 5, q. 2, a. 2, q. la. 5, sol. 2. See also *Sent.* IV, d. 1, q. 1, a. 4, sol. 4, and *Q. D. de Malo*, q. 4, a. 3, for similar divisions between instrumental causes, on the one hand, and both univocal and equivocal ones, on the other.

Thus, maybe a more cautious way of stating the relation between equivocal and instrumental agents would be to say that the same agent can be both, but they are simply other in account: The seed might be called instrumental from one perspective, and equivocal from another. Specifically, if one attends merely to the sheer difference between the agent's mode of possessing the form of the effect and the effect itself, one would call the seed an equivocal cause of animal life; yet if one attends also to its mediation in causality, and therefore the transitional character of its possession of the form it passes on, one would call the seed an instrumental cause of it. This would in turn suggest that St. Thomas is sometimes using the designation "equivocal cause" in a looser, or extended, sense when he says it of the seed, as he does in the *Metaphysics* commentary.

This consideration of the relation between equivocal and instrumental causality lays a foundation for taking a closer look at the "more eminent" way that the equivocal agent has the form it gives. Perhaps the most obvious induction one would make from our examples is that the expression "more eminent way" does not appear to mean the same thing in all cases. Recall that in the case of the artist, the agent bears the form in a spiritual mode, but generates it in a material mode, whereas in the case of the white wall, the agent bears it in a material mode, and generates it in a spiritual mode. And if the medicine is a per se agent cause, it must bear the form of the health it gives in a higher way than does that animal that receives it, yet not such that the medicine is more truly called "healthy" than is the animal, any more than the animal seed is more truly deserving of the name "animal" than is the offspring it effects. (One is, then, tempted to say that these equivocal agents bear the form in a less eminent way.) Thus, it seems to be asking too much to expect a single account of greater eminence from these examples.

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Yet, in some of these cases, the superiority of the equivocal cause's possession of the form stands out. Taking again the artist and the white wall, it is clear that the effect is in certain respects more perfectly in the agents than in their patients, albeit in somewhat different ways. The wall, for instance, is more truly white than is the eye or the intermediate air, and the air and the eye are participating in the whiteness of the wall by, first, conveying it to the eye, and then by seeing it. The whiteness in the wall is the natural and complete existence of white as such, but the impressed species of the white exists only so as to intend, or cognitively relate, the eye to that naturally existing white. If the form is successfully impressed on the eye, the eye is now oriented to, and thus dependent on, the white of the wall. In this sense the form is clearly in a subordinate position relative to its existence in the equivocal cause, and in this sense the material possession of the form is more eminent than the spiritual possession in the medium.

In a superficial way, the converse seems to be the case with the architect and the house: One might think that, because the architect has the idea of the house only for the sake of making real houses (like all thoughts in the practical intellect), then the more eminent form of the house is in the real house. This is, of course, true in a sense; surely no one wants to live in a merely mental house. Nevertheless, it is also clear that the completed house, as based on the idea of the house in the architect's mind, which idea is itself a manifestation of his soul's art, exists as the fulfillment of that art. His actions are oriented toward building the house, but the house, as it comes to be, is oriented toward the blueprint in his mind. This is why the architect judges the goodness or badness of the house by whether it measures up to the perfection of the planned house. Were he to intend to build a house and instead end up with a skyscraper, he would have failed as a house-builder; whatever the merits of the skyscraper,

it would be rightly described as a monstrosity of a house.

This is even clearer when one considers that the artisan's art allows him to generate not just this house, or even other identical houses, but perhaps a myriad of houses and buildings of different shapes and sizes, all depending on the possibilities contained within the scope of his art and the conditions under which it can be employed. Aristotle in one place even says that "the form of the house in the intellect *is* the art";¹⁰ thus the relevant form in the architect in virtue of which he makes houses is not merely the imagined house, but the art according to which the house is conceived and imagined. The artist as such, then, clearly possesses the universal form he generates in a more eminent way than the finite and contracted way it is received by an individual edifice. Hence, also, the art as such is ordered toward building many houses, so as to more fully manifest its virtue. Perhaps something similar is true of the white wall as well: The illuminated wall shines in all directions so as to be visible to many eyes, from many perspectives, and perhaps in various ways by different kinds of eyes. At any rate, St. Thomas seems to be making this point when he describes the effect of an equivocal cause as "unequal to the power of the agent cause," so it

receives the likeness of the agent not according to the same account, but deficiently, such that what is in the effects dividedly and in a manifold way [*divisim et multipliciter*] is in the cause simply and in the same mode [*simpliciter et eodem modo*].¹¹

What is unified as one art in the soul of the artist is manifested in only a partial way by each artifact, but is more and

¹⁰*Metaph.* VII, 9 (1034a25).

¹¹*STh* I, q. 13, a. 5, c.; see also q. 57, a. 1, c.

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more adequately approximated when the artist makes many, and significantly different, artifacts.¹²

In fact, these two otherwise opposed examples of equivocal causality might be described in common this way: Both the sensible object and the artist are fulfilled by communicating themselves to things outside themselves, yet they themselves never become replaced by their effects (the seeing eye, on the one hand, or the physical house, on the other); rather, these causes remain the focus of their effects. Thus, these equivocal agents always possess the paradigmatic form they are communicating to their effects, and therefore they do so in a more eminent way, just as the thing participated in as such is a thing superior to the things participating in it. Whence, just as the wall is called “white” most properly while the air and the eye less properly, yet fittingly, in a similar way a house may be called a “Frank Lloyd Wright” less properly than the architect, yet it is fittingly named after him because it is a likeness, and therefore a manifestation, of the art in his mind.

Now, the medicine and the seed examples are more difficult. I suspect that part of the impediment here is precisely because these equivocal causes are also instrumental causes, which (I proposed above) are called “equivocal causes” in a looser way than are the others. In the case of the medicine we can think of the principal agent as the physician or even the patient’s own soul; either way, the medicine is usually employed to assist in the healing, not to be its complete and sufficient cause. Thus, whatever sense there is in saying that even here the equivocal cause has the form it gives in a more eminent way, one would expect it to be a reduced kind of greater eminence than one finds in the non-instrumental examples, like the wall and the architect.

¹²Compare creation as imitating the Divine through distinct and mutually exclusive substantial forms.

Let us take a moment, then, to consider instrumental causes in general. In instrumental agency, what stands out is not only the instrument's spatial and causal intermediacy between the principal agent and the ultimate effect, but also its functioning as an amplifier of the principal agent's agency. An instrumental agent is not analogous to a second domino in a series, where it is interchangeable with either the first or the third. Instruments, properly speaking, are extensions, and at the same time refinements or specifications, of the principal agent's action. Think of a soldier's sword, or even his shield: The former gives one's arm both a greater reach and also, because of its determinate shape and material, a more effective agency; the latter gives the soldier's arm greater strength to repel agency from the body. Likewise, a teacher uses words to make his knowledge sharable; he teaches through his words themselves conjuring thoughts to his student. A cook holds the pan through his wearing an oven mitt. A carpenter cuts the wood through his saw. Thus, an instrument is that through which the principal agent itself is acting per se. It is a moved-mover, yes, but not in such a way that the instrument's action is simply attributable to the instrument's own intrinsic character. The form being brought forth in the artifact in a way exists in the instrument, insofar as the instrument is an extension of the artisan as such, but not in such a way that the form inheres or rests in the instrument. Hence, St. Thomas often describes the instrument as having the form it gives in a "flowing mode," and "intentionally" (like the way the transparent medium bears the white to the eye in what today we would describe as a light wave).

Here we see the difficulty in grasping the more eminent mode in these cases. The fact of this conduction of the form—rather than a proportioned possession of it—suggests, in different ways, both imperfection *and* perfection when compared to the form as it exists in the patient. It suggests imperfection

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insofar as the form is not there in any lasting way; it is not held on to, and therefore in this respect the artifact possesses it far more perfectly. It suggests greater perfection, however, insofar as the form passing through the instrument is by definition ready to be communicated or conducted to the patient, because the instrument is an extension of the principal agent, whereas the form as received by the patient is in no way apt to communicate itself: Freshly cut wood is useless for cutting more wood, just as benches do not craft more benches, and even students who have learned well are not necessarily ready to teach, and certainly not without themselves using more words as *their own* instruments.

Thus, the medicine too is able to bring about health without itself being healthy (in the proper sense of the word). Whether as an instrument of the artful physician or of the still healthy parts of the body, the medicine helps bring forth the form of health in the animal. In this way, then, the manner with which it bears the form of health is in a certain way superior to the manner with which the animal itself bears it: simply because the medicine, as such, has the power to mediate health, whereas the healthy animal does not. We do not cure the sick by simply surrounding them with the healthy, since health is not contagious. Likewise, ingesting your medicine is more likely to cure your illness than is eating a healthy animal. Indeed, you would have to take away its health—by killing it—before you could eat it.

Something similar is true, at least in Aristotle's account, of the animal's seed: It has no animal soul in itself (or if it does, it is an animal of a lower sort than what it generates); yet the seed can bring such a soul into act in the matter in which it is implanted. It must, therefore, possess in a vestigial and transitory way the power of an adult animal soul, such that it can act as though it were an animal. Again, its more eminent bearing of the animal soul is indicated by this very power, for the seed can generate, whereas the newly conceived animal cannot. The seed is fecund

whereas the embryo, for now anyway, is sterile. Nor is this ability to act like the adult animal inconceivable, since the seed is itself something generated by the adult animal. It has this ability precisely because it is produced by something that has the proportionate form. Again, consider the visible object: The intentional white in the medium can effect sight in the eye only because the intention in the medium is itself the immediate effect of the color in the wall. In fact, it is surprising that St. Thomas never seems to speak of the animal's generation of the seed itself as an instance of equivocal causality, since surely if the seed has the form of the embryonic animal in a higher way, then *a fortiori* the adult has that form in a higher way than the seed itself. Perhaps, then, the animal's own ability to produce seed is another example of equivocal agency.

In fact, it might be a better example than the seed's generation of the animal. For one must speak with some reservation about Aristotle's seed example, since it now looks like it's a mistake to think that the male seed alone is the agent cause of generation; present day embryology has shown that both sperm and ovum are mutually active. Perhaps this does not change our account much, however, since now we may simply have *two* equivocal instrumental agents to consider, each of which acts upon the other. Modern embryology does suggest, however, that a better analogy for understanding conception is not so much that of artisan and materials, but more that of chemical elements combining, although conception would be more active than chemical combination seems to be. But that is not clear either: Obviously hydrogen and oxygen are material causes of the coming to be of water; are they also its agent causes? And if so, would we call them equivocal agents? That's not completely clear to me. That said, even if there is something puzzling about the agencies involved in conception, these puzzles do not stand in the way of the clearer cases of equivocal causality—any more than

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obscurity about whether a bacterium is alive should interfere with our recognition that a horse is.

Having given what amounts to a long illustration of what equivocal agency is via examples and comparisons, I will now make the case that such a thing exists. The starting points lie in two axioms, one common to agency as such, and another that is first recognized only in special cases of agent causality. The first is that every agent causes its like; one finds St. Thomas asserting this in one form or another whenever he is about to introduce equivocal causality. Thus, in the passage from the beginning of the *Summa* with which I began this paper, he says that “whatever there is of perfection within an effect must be found within the efficient cause, either according to the same account ... or in a more eminent way ... For it is manifest that the effect preexists, by power, in the agent cause.”¹³ He states the same more explicitly in the *Contra Gentes*:

Effects falling short of their causes do not agree with them in name and account, yet it is necessary that there be found a certain likeness between them. For it is of the nature of action that the agent would effect a like to itself [*agens sibi simile agat*], since each thing acts according as it is in act. Whence the form of the effect is found in a certain way in an exceeding cause, but according to a different mode and a different account [*alium modum et aliam rationem*]¹⁴—by reason of which it is called an equivocal cause.¹⁴

¹³*STh* I, q. 4, a. 2, c.

¹⁴*ScG* bk. I, ch. 29, par. 2. See also *Sent.* IV, d. 1, q. 1, a. 4, sol. 4: “Every agent effects a thing like itself, so the effect of the agent must be in some mode in the agent. For in some it is the same according to species, and such are called univocal agents (e.g., heat in a fire heating something), but in some it is the same according to proportion or analogy [*proportionem sive analogiam*] (e.g., when the sun heats something).”

Because the very notion of an agent cause is of something bringing something else to a form by communicating its own form to it, the way that that “something else” is changed is a becoming conformed to the agent. Thus, there cannot be an agent cause that, as such, makes something to be unlike itself; that would be a contradiction in terms. As a corollary, then, we can even say that, other things being equal, we would expect all agents to be univocal causes. They would make another to be specifically like to themselves, just as human beings beget other human beings, something hot makes other things hot, cancer cells turn healthy cells into cancer cells, and rolling billiard balls send more billiard balls rolling.

But rarely are other things equal. Sometimes the character of the patient being acted upon imposes severe limits on what the agent can share. Thus, in the *Prima Secundae*, in the context of discussing how many moral virtues there are, St. Thomas points out, after recalling the first axiom that the effect must become like the agent, that another axiom must be applied:

One must consider that the matter of the patient holds itself to the agent in two ways: For sometimes it receives the form of the agent according to the same account as it is in the agent, as is in all univocal agents. ... But sometimes the matter does not receive the form from the agent according to the same account as it is in the agent, as is clear in non-univocal generations, such as an animal being generated by the sun. And then those forms received in the matter from the same agent are not of one species, but are made diverse according to the matter’s diverse proportion for receiving the influence of the agent, just as when we see in putrefaction that from one action animals of diverse species are generated by the sun, according to a diverse proportion of the matter.¹⁵

¹⁵*STh* I–II, q. 60, a. 1, c.

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The different species he has in mind he elsewhere identifies as maggots and mice. However, here the fundamental principle being brought to bear is that whatever is received is received according to the mode of the receiver. Thus, the explanation for the existence of equivocal causes really lies in the things they are acting upon. Some things—given what they are or what they are made out of—simply cannot receive the form of the agent in its fullness. As St. Thomas summarizes it in the *Sentences* commentary, sometimes the “agent is not proportioned to the one receiving its effect; whence the effect does not attain the species of the agent, but a certain likeness of it, as much as it can [*quantum potest*], as in all equivocal agents.”¹⁶

We see this in some of the examples considered above: The house is not able to reflect the full scope of the causality of the house-building art, but it does so to the degree that it can, given the materials available and the character of the building site; this is unlike perhaps the architect’s student, insofar as here the teacher is a univocal cause of the art. Likewise, the transparent air and the eye itself cannot receive the form of white the way it exists in the wall; were the air to become white the way the wall is, it would cease to be transparent and become opaque, just as, if the eyeball were to become white this way, not vision but blindness would be produced. The color of the wall is not the sort of thing suited to acting upon light-propagating media or on visual organs such that it could be a univocal cause of their change, so it is an equivocal one.

These two principles—every agent makes something like itself, and every patient receives the form of the agent according to the patient’s capacities—being self-evident, at least to the wise, the *possibility* of equivocal causality seems manifest.

¹⁶*Sent.* II, d. 1, q. 2, a. 2, sol. See also *In II Phys.*, lect. 11, par. 2; and *STh* I, q. 104, a. 1, c.

Whether there *are* such causes in fact, however, depends in a good measure on experience. Thus, the examples given above amount to a sort of proof that there are such things. To the extent that it is clear that they are instances of agent causality, and that they do not possess the forms they educe in the same way that they are found in their effects, we see that there are equivocal agents. However, to the extent that someone might object to them—i.e., if someone could make a case that they are not *per se* agent causes, or that they are really just hidden univocal causes—then the examples would not settle the question, at least if such doubts could be raised about all of them and, of course, if one could not find any others.

St. Thomas does, however, offer a demonstration that the existence of equivocal causes is not only a matter of fact, but even one of necessity. He does this in several places when he argues for the existence of universal agent causes. Before presenting this argument, however, I want to add to the previous survey of distinctions among equivocal agents by proposing that—although equivocal and universal causality are often treated interchangeably, as though every equivocal agent is a universal agent, and vice versa—in fact they are not the same thing. Understanding better this relationship will enable us to evaluate the demonstration St. Thomas gives.

We can begin to see the difference between equivocal and universal causes when we attend to the meaning of their names, and even their respective opposites. Although the opposite of an equivocal cause is, of course, a univocal one, the opposite of a universal cause is a particular cause. Even at first glance, one recognizes that “equivocal” is no more a synonym for “universal” than “univocal” is for “particular.” When considering universal causality, synonyms St. Thomas uses for the adjective “universal” are “general” and “common”—obvious synonyms. And although St. Thomas’s preferred example for an equivocal cause—the

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sun—is also an instance of a universal cause, this does not imply that to be an equivocal cause is the same thing as to be a universal cause.

This will become clearest, however, if we simply explain universal causality not so much in its distinction from equivocal causality as in its distinction from particular causality. Consider this passage from Book Two of the *Physics* commentary:

It is manifest that every power extends to certain things insofar as they hold in common one account of an object [*communicant in una ratione obiecti*]. And inasmuch as a power extends to more things, so far is it necessary that that account be more common [*communiorem*]; and if a power is proportioned to the object according to the object's account, it follows that a higher cause acts according to a more universal and less contracted [*magis universalem et minus contractam*] form. And one must consider the order of things in this way, because inasmuch as some things are *higher* among beings, so far do they have less contracted forms, and forms more dominant over matter, which matter restricts [*coarctat*] the power of a form.¹⁷

Causes differ in scope. While the typical agent cause as such acts upon one particular thing (and so is called a “particular cause”), a prior but simultaneously acting cause whose scope is broader, and therefore brings about many things of a single character or *ratio*, causes more universally (and so may be called a “universal cause”). Thus, the universal cause must act through a form that is itself in some sense more universal, more encompassing, or not as narrow and exclusive as the form through which a particular agent acts.

¹⁷*In II Phys.*, lect 6, par. 3.

Yet this should not be understood to mean that the universal cause causes merely some generic aspect of the effect, while the particular cause causes the effect in its species, or even merely its specific difference. There is a *per se* subordination between universal and particular causes of a single effect, and therefore we are not dealing with two partial causes of one effect, like my holding up one end of the table and you holding up the other. Just as the genus and the species are really the same form considered in different ways, the universal and particular cause bring about the same reality but in different orders of agent causality. On the mistaken interpretation of universal causality, neither the universal nor the particular agent would cause the whole effect. That would, in turn, destroy the unity of the effect (implying that the effect *as a whole* has no *per se* cause). Moreover, this would imply that a universal cause is only superficially the source of the effect, whereas the particular cause is determinative more intimately. St. Thomas indicates that this undermines the entire idea of universal causality. As he puts it in the *De Potentia*:

In the degree that a cause is higher, to that degree it is more common and more thoroughly an agent [*communior et efficacior*], and in the degree that it is more thoroughly an agent, to that degree it more profoundly enters into the effect [*profundius ingreditur in effectum*], and from a more remote potency this very cause leads the effect into act ... Thus, if we consider the individual agents, every particular agent is immediate to its own effect; if, however, we consider the power by which the action comes to be, thus the power of the higher cause will be more immediate to the effect than the power of the lower. For the lower power is not conjoined to the effect except through the power of the higher.¹⁸

¹⁸Q. D. *de Pot.*, q. 3, a. 7, c. See also *STh* I, q. 79, a. 4, c.

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Thus, a more universal cause is more encompassing in more than one dimension: Not only is it broader in the number, and perhaps even species, of effects it brings about, but it brings about the individual effects at a deeper level, such that any particular cause between the universal agent and the ultimate effect is itself only an agent by having a (limited) participation in the agency of the universal cause. Thus, the most universal cause would produce not merely the most universal aspect of the effect, but in a fundamental way the whole effect itself, and nothing about the effect would simply escape its reach.¹⁹

Hopefully by now it is clear what I see as the relationship between universal and equivocal agents. A universal agent must be an equivocal agent; for since the universal agent generates a multitude of things as members of a genus, it must have the form that it brings forth in the members of the genus in a higher way than do the members themselves. Thus, every universal agent is an equivocal agent. But it does not seem that this universal affirmative converts universally; it is not necessary that whenever an agent possesses the form it gives in a more eminent way it must also cause all the individuals that possess that form. The equivocal agent might possess in a higher mode what it gives and still give it to only one individual. Think of some of our examples: The seed is an equivocal cause of the conception of the animal, but in no sense is it a universal one; it has only one effect: this animal's generation. Likewise, the medicine the doctor gives heals this sick man, but not all sick men. The effects of these equivocal causes should be sweeping if they must also be universal causes; they should be genus-wide. In short, it seems to me that there are equivocal causes that are also particular causes.

This is not to deny, however, that universal equivocal causes are the most interesting equivocal causes, nor that some

¹⁹See *STh* I, q. 46, a. 1, ad 6, and q. 103, a. 7, c.

of the other examples we have considered come closer to universal equivocal causality. The architect, as we described him before, resembles a universal cause of houses—at least of all the houses he can generate. Frank Lloyd Wright is the cause of the genus of Frank Lloyd Wright houses as such. Although it is true that he cannot produce them all simultaneously, it is not impossible for him to produce many of them at once by means of a multitude of workmen. In addition, the architect causes the houses more intimately than do the electricians, masons, framers, and even the subcontractors. Likewise, the color of this wall resembles a universal cause insofar as it shines in all directions, illuminating the entire medium around it and often impressing its species in a number of eyes at once. Although the quasi-genus it causes is not the white *as such*, it—and it alone—generates impressed species intending this-white-wall-as-such.

Having distinguished and related equivocal and universal causes, we can finally turn to St. Thomas's argument that there must be equivocal causes. The reasoning centers on universal equivocal causes, and I hinted at it a moment ago. Although St. Thomas offers different versions of it in several places, a relatively succinct presentation of the argument can be found in the *Contra Gentes*. There he presents it most forcefully with reference to the most universal of universal causes, God Himself:

No univocal particular agent [*particulare agens univocum*] can be simply the cause of a species, just as this man cannot be the cause of the human species; for then he would be the cause of every man, and consequently even of his very self, which is impossible. This man here [*hic homo*], however, is the cause of that man there, speaking per se. Moreover, this man exists through this: that human nature exists in this matter that is the principle of individuation. Therefore this man is not the cause of man except inasmuch as he is the cause of

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the human form coming to be in this matter. However, this is to be the principle of the generation of this man. It is clear, therefore, that neither this man nor any other univocal agent in nature is a cause but of the generation of this or that thing. It is necessary, however, that there be some *per se* agent cause of the human species itself; this is indicated by the composition of the species itself, and the ordination of the parts (which hold themselves in the same way in all of them, unless they are accidentally impeded). And the account is the same for all other species of natural things. This cause, however, is God—whether through middles or immediately—for it has been shown that he is the first cause of all things.²⁰

Since the complete causal account of a thing requires a cause not only of the thing's coming to be here and now in this matter, but in addition a cause of the thing being *what* it is—indeed, a cause of all the instances of its species as such—one is forced to posit a universal cause that possesses the form it gives in a higher way than the members of the species receive it. For otherwise the cause would have to have the form in a univocal way, and therefore be a member of the species, and therefore a cause of its very self.

Now, I realize that it might take some work to defend the claim that a *per se* cause is necessary not only to explain the individuals in their individual coming to be, but to explain even the individuals as members of a species, as bearing a common substantial form. St. Thomas hints at an argument for this when he says that the objective unity and ordering of the members under the species is a sign of an effect in need of a proportionate cause. It is enough, however, for now to point out that, granted this premise, universal equivocal causality must be as real as

²⁰ScG III, c. 65; see also II, c. 21; *STh* I, q. 104, a. 1, c.; *Q. D. de Pot.* q. 3, a. 7.

any species. To explain the unity and reality of all species, there must be at least one universal equivocal agent—and clearly St. Thomas is suggesting that there are several. But *if* there is only one, then clearly we are talking about God.

But minimalism about equivocal causality, even universal equivocal causality, seems to me almost as misplaced as minimalism about agent causality in general.²¹ It is true, as the occasionalists used to point out, that the first Mover is sufficiently capable of originating all motions here below all by himself; there is no finite agent causality that an infinite agent cause is not up to exerting by himself. To modify Laplace's answer to Napoleon, the occasionalist would declare agent causes other

²¹Is it going too far to compare denial of equivocal agency to a denial of agency altogether? Recall that Hume's preferred examples for showing that we do not know cause/effect relations are ones where the agent and the effect are specifically different: "Adam ... could not have inferred from fluidity and transparency of water that it would suffocate him, or from the light and warmth of fire that it would consume him" (*Enquiry Concerning Human Understanding*, sect. 4, part 1). With these examples Hume is at his most persuasive, but then from examples of what amount to equivocal agency Hume shifts to univocal agency: Without experience we could not "have inferred that one billiard ball would communicate motion to another upon impulse" (*Ibid.*). Then he puts the claim most boldly:

The mind can never possibly find the effect in the supposed cause, by the most accurate scrutiny and examination. For the effect is totally different from the cause, and consequently can never be discovered in it. Motion in the second billiard ball is a quite distinct event from motion in the first ... In a word, then, every effect is a distinct event from its cause. (*Ibid.*)

Just as with an equivocal cause and effect a generic likeness is not enough for us to see the one in the other, so too neither with a univocal cause and effect is a specific likeness just as opaque. Hume is saying that, let them be ever so univocal, if they are even merely numerically distinct, we cannot see that the one comes forth from the other: "All events seem entirely loose and separate" (sect. 7, part 2). In Hume's mind, all cause/effect relationships may as well be equivocal ones.

ARE THERE ANY EQUIVOCAL CAUSES BESIDES GOD?

than God a “hypothesis for which I have no need.” But to say that God is the only cause that one absolutely has to posit is not in tune with everyone’s immediate experience of agent causality, most obviously when we’re on the receiving end, but also when we ourselves act. And further—and this is most relevant to equivocal causality—minimalism about whether there are agents, even equivocal agents, besides God does no justice to God’s own causality. For God to create and sustain in existence the cosmos, he communicates to things not only rudimentary existence, but his very life, which includes his causality. An agent makes a thing be like itself, so the first cause brings things not only to be but to be causes. And if God gives all of his creatures a participation in his causal being, it is likely that he also gives some of them a more perfect participation in it. We see, not only from revelation, but from the observable order of the cosmos, that God elevates many of his creatures into higher and richer modes of agent causality—from Moses’s mediation of the Law to the Israelites, to man’s natural dominion over the animals and even more so over inanimate nature in the arts. We should, then, expect to find equivocal causes, placed as it were at regular intervals, throughout the structure of the cosmos. We should be on the lookout for them.

Identifying such examples may not be easy in many cases—again, some that *prima facie* appear to be instances of equivocal causality might, upon closer inspection, turn out to be merely instances of hidden univocal causality, as the spontaneous generation of fly larvae in putrefying matter showed. Still, I think there are instances that look promising, instances ranging from within ordinary experience all the way to theoretical physics. For instance, it seems plausible to say that an animal’s secretions (whether of sweat, tears, or bodily oils) amount to equivocal generation, the living turning part of itself into a non-living substance. Likewise, it is tempting to think of the

complex wave motion that defines a vibrating string's peculiar timbre, which therefore possesses a peculiar overtone series, as rendering one note an equivocal cause of several other notes in other strings. Or again, how else should we interpret the notion from general relativity that a massive body (say the Earth) curves the gravitational field around it, and that curved space in turn causes a second body (say the Moon) to gravitationally orbit the Earth? A mass seems not to cause the field to become massive, like a univocal cause would, but to warp it, apparently making something that is only equivocally like itself.

But a deeper consideration of possible cases of equivocal agency would be another paper, and my speculations would be based on far more limited knowledge. For now I think it is enough that we have seen both that St. Thomas has other examples ready at hand besides the obsolete or at least theory-laden example of the sun, and that the notion of equivocal causality itself is intelligible, and in some measure unavoidable. At a minimum, we are, as a result, better situated for contemplating the example St. Thomas really wants to talk about when he brings up equivocal causality, namely, the most universal of universal equivocal causes, God Himself.²²

²²This paper was presented at Thomas Aquinas College as a part of the West Coast meeting of the Society for Aristotelian-Thomistic Studies, June 19th and 20th, 2014, the theme of which was "Philosophy as the Handmaiden of Sacred Theology."

**THE SCIENCE OF TRUTH AND
THE PERFECTION OF THE KNOWER:
A REFLECTION ON ARISTOTLE'S METAPHYSICS II**

Christopher O. Blum

*Est autem considerandum quod Aristoteles, brevitati studens,
non ponit in definitione verbi ea quae sunt nomini et
verbo communia, relinquens ea intellectui legentis ex his
quae dixerat in definitione nominis.*

Aquinas, *Expositio Periermeneias* I, lectio 5, #2

We ought to be grateful, according to Aristotle, to all those who have philosophized, whether they have done so well or poorly, for at least they have helped to develop “the powers of thought.”¹ Philosophers, it seems, typically stimulate one another by calling attention to things and asking questions about them. Yet one can also be prodded to inquiry by what philosophers overlook,

Christopher O. Blum is a graduate of the University of Virginia. He completed his Ph.D. in the History and Philosophy of Science at the University of Notre Dame in 1996. He is Professor of History and Philosophy at the Augustine Institute, Greenwood Village, Colorado, where he also serves as the Academic Dean.

¹Aristotle, *Metaphysics* 2.1.993b13–14. Unless noted, all quotations from Aristotle are taken from *The Complete Works of Aristotle: The Revised Oxford Translation*, ed. Jonathan Barnes, 2 volumes (Princeton: Princeton University Press, 1984); subsequent references to Aristotle in this edition will be made parenthetically in the text.

if a trend becomes perceptible. Such a trend of benign neglect has befallen the second book of the *Metaphysics*. Consider that although in the preface to his *New Aristotle Reader* J. L. Ackrill explains that “in selecting the texts” he had “tried to include all [those] necessary for a careful study of most aspects of Aristotle’s philosophy,” nevertheless in a volume of generous size this brief and pungent book is simply omitted.² Similarly, the voluminous *Oxford Handbook of Aristotle* does not contain a single reference to it.³ Even commentators puzzled by *Metaphysics* II seem to be so with comparative unconcern. John Rist, for instance, states his view that the book is “an introduction to the *Physics*,” but then declares that this thesis “needs little defense” and only a brief explication—and this in spite of Reale’s arguments in favor of its authenticity and rightful place within the *Metaphysics*.⁴ Rist’s lone argument for the interpretation is, as he admits, the same one made by Alexander of Aphrodisias long ago about the book’s final paragraph: “This kind of remark (re nature) is wholly inappropriate to introduce Aristotle’s *Metaphysics*, wholly appropriate to introduce his physics.”⁵

²J. L. Ackrill, ed., *A New Aristotle Reader* (Oxford: Clarendon Press, 1987), xi. The work is some 600 pages in length.

³Christopher Shields, ed., *The Oxford Handbook of Aristotle* (Oxford: Oxford University Press, 2012). The *Index Locorum* includes an entry (on p. 701) for the lines bearing Bekker numbers 994b10–13, which are indeed located in Book II, but the entry is in fact the result of a typographical error; the passage actually referred to in the text is from Book I (1.4.984b10–13).

⁴See Giovanni Reale, *The Concept of First Philosophy and the Unity of the Metaphysics of Aristotle*, trans. John R. Catan (Albany: State University of New York Press, 1980), 43–5.

⁵John M. Rist, *The Mind of Aristotle: A Study in Philosophical Growth* (Toronto: University of Toronto Press, 1989), 229–30. Cf. Alexander of Aphrodisias, *On Aristotle’s Metaphysics 2 & 3*, trans. William E. Dooley, S.J. and Arthur Madigan, S.J. (Ithaca: Cornell University Press, 1992), 10: “The conclusion of this book does not seem to belong to the structure [of the *Metaphysics*], but to be a kind of introduction to the treatise on nature.”

Standing against the trend of overlooking Book II⁶ is the text itself, which contains memorable and indeed celebrated passages such as, “as the eyes of bats are to the blaze of day, so is the reason in our soul to the things which are by nature most evident of all” (2.1.993b10), “as each thing is in respect of being, so is it in respect of truth” (2.1.993b30), and the terse argument for the necessity of there being a first efficient cause, which argument Aquinas himself endorses in his commentary on Book XII.⁷ Each of these three passages stands out within the Aristotelian corpus, and their presence together in a single book gives ample justification for thinking it to be important. Yet perhaps what ought to be noticed first about *Metaphysics* II are its two leading characteristics: that it calls the reader’s attention to the subject of truth, and that its three chapters seem at first to be thrown together haphazardly. As the book begins with truth, and as its overall coherence is to be seen in its concern for the perfection of the knower through the attainment of truth, it is with the subject of truth that a reading of it should begin.

In his *Eudemian Ethics*, Aristotle brings the terms wisdom and truth together in a declaration that “the philosopher intends to occupy himself with wisdom and the contemplation of truth” (EE 1.4.1215b1). Nevertheless, the opening line of *Metaphysics* II that promises a theoretical consideration of truth constitutes something of a verbal shift from what has come before. The wisdom spoken of in Book I is described as a knowledge of the first cause or causes; so is the truth canvassed in Book II. What, then,

⁶Ralph McInerny, although certainly aware that some have argued that the book does not belong where we find it, was content to reproduce Aquinas’s brief summary judgment of it in his narrative overview of the *Metaphysics* as a whole. See McInerny, *Praeambula Fidei: Thomism and the God of the Philosophers* (Washington, DC: The Catholic University of America Press, 2006), 229–30.

⁷See *Sententia libri Metaphysicae*, Liber 12, lectio 5, Marietti #2499.

does Aristotle stand to gain by asking his reader to think about the knowledge of God as a kind of truth, in addition to being a kind of wisdom? It seems that he was concerned to underscore his conviction that the subject of divinity admits of a reasoned-out treatment: the phrase “science of truth” at 2.1.993b20 suggests as much.⁸ Wisdom is a word relatively easy to take analogously, perhaps even equivocally. Truth, rooted as it is in our everyday disclosure of our judgments, is much harder to peel away from its opposite—falsehood or error—than wisdom is from myth. The word truth, therefore, seems more apt to be taken narrowly and with precision as a quality of our thoughts, a quality that follows upon the act of composing and dividing, whereas wisdom seems almost to invite a looser, and perhaps even a poetic, interpretation. Pythagoras, after all, memorably proclaimed himself to be a lover of wisdom, while at the same time expressing himself in such a way as to be open to the critique made by Heraclitus that he had “made a wisdom of his own” that consisted in “much learning” but was “mere fraudulence.”⁹ If, as Aquinas suggested, Book II as a whole is to be understood as a treatment of “how man stands with respect to the knowledge of truth,” then perhaps it can be profitably read as a discourse on how to pursue perfection in the intellectual life.¹⁰ To read it this way is to travel a road that others have mapped out, notably Aquinas and his follower the seventeenth-century Jesuit Sylvester Maurus.¹¹

⁸The sentence reads: ὀρθῶς δ' ἔχει καὶ τὸ καλεῖσθαι τὴν φιλοσοφίαν ἐπιστήμην τῆς ἀληθείας.

⁹Heraclitus, as reported by Diogenes, in Jonathan Barnes, ed., *Early Greek Philosophy*, 2nd edition (London: Penguin, 2001), 59.

¹⁰*Sententia libri Metaphysicae*, Liber 2, lectio 1, Marietti #273: *quomodo se habeat homo ad veritatem cognoscendam*.

¹¹See Sylvester Maurus, S.J., *Aristotelis Opera Omnia Brevi Paraphrasi et Litterae ... Expositio*, 4 volumes (Paris: Lethielleux, 1886), IV: 295–302.

Book II begins with the gracious observation that there is a sense in which the knowledge of truth is easily attained because “everyone says something true about the nature of things” (2.1.993b2), a concession that calls to mind the opening chapter of the *Physics*, with its robust statement of his confidence in the trustworthiness of our general impressions of things, as well as Aristotle’s handsome response to Parmenides in the eighth chapter of the same book. Knowing comes naturally to man, and that we are knowers is a starting point for reflection, not a conclusion to a course of reasoning. The wonder is, rather, that being knowers, we should be so frequently in error, a matter that is especially perplexing given the reliance of our minds upon our senses, which are themselves so very trustworthy. So, it is error that needs accounting for, and Aristotle attempts to do so here in two ways. First, he notes that there is a difficulty indicated by the fact that “we can have a whole truth and not the particular part we aim at” (2.1.993b6), and secondly, he describes our condition as knowers with the well-known comparison of our intellects to the eyes of bats. Both accounts, as Aquinas and Sylvester explain them, point to our nature as knowers.

To take the second difficulty first: it is a truth testified to by common experience that we come into the world with minds unformed and then go about forming them through our sensory experiences. But sensible things are so firmly rooted in the potentiality of matter that they are limited in their intelligibility. Somewhat like motion considered in itself, movable beings are “difficult to know, but able to be.”¹² And so, because we necessarily understand the universe—both visible and invisible—through our experience of material and movable things, we grope unsurely toward the knowledge of the immaterial first cause. Moreover, the ways along which our minds must travel

¹²Aristotle, *Physics* III.2.202a1, trans. Coughlin.

to that end are fraught with difficulty, for both the way *back* to the first principles—the road of comparison, division and, at length, definition—and the way *from* the first principles—the road of demonstration—are journeys that risk the possibility of making wrong turns. To take a homely example: that the thing that moves itself toward food and away from harm is an animal we are sure, but what kind of animal and whether it is warm-blooded and bears live young are matters about which we may be very much misled, and at times, even misled by argument.¹³ Errors in thought, then, are prone to arise because the things we are best suited to learn about are underdetermined, while our learning about them necessarily involves mental processes that are themselves fallible.

Having noted that we are prone to err in our thinking, Aristotle next observes that we ought to be grateful to our fellow travelers along the road to truth, for by bringing forward their opinions, they have been “developing before us the powers of thought” (2.1.993b14). What he seems to be pointing out with this phrase, in the first place, is that our predecessors and fellow inquirers call our attention to a given subject, or, what may be still more valuable, they call our attention to a mode of treating a subject of common interest. Although Aristotle's own habits of inquiry were omnivorous, his conviction that we ought to be chiefly concerned to know about the first causes and final ends is evident from passages such as *Parts of Animals* I.5 and *Ethics* X.7, to say nothing of the *Metaphysics* itself. He valued the habit of looking to more and more prior causes and more and more final ends, a conviction that may be what lies behind his pointing to some of his predecessors as having been “the better thinkers” (2.1.993b18). His commendation of Anaxagoras for

¹³A parallel point is made in St. Basil's Letter #16 to Eunomius concerning our knowledge of the ant.

having insisted that inquiry into nature consider mind as a cause is suggestive in that regard.¹⁴ In any event, the teaching of the passage seems to be that we manifest our debt to other thinkers—even to those with whom we disagree—by our willingness to attend to the same intelligible objects they have proposed for our consideration.

At the first chapter's close, Aristotle ties the knot that binds the love of wisdom to the search for truth by making it clear that both concern the knowledge of causes. In the first book, he had already established that wisdom was to be ascribed to the one who knew the causes of things, just as the wise doctor knows the causes of health and the wise general the causes of victory. Here, he makes explicit the connection to truth, stating "we do not know a truth without its cause" (2.1.993b23). In the case of the axioms—the truths that are first in our knowing, in the order of resolution—the cause of the necessity of the predicate inhering in the subject is in the nature of things alone. In the case of subsequent truths, it is thanks to a middle term that we are enabled to acknowledge their necessity. But we may very well wonder about the cases in which the truth of a proposition is known to us by a demonstration but concerns something whose nature is immaterial, and therefore, beyond the reach of our experience. The ascent here is vertiginous: "The principles of eternal things must be always most true [for] they themselves are the cause of the being of other things" (2.1.993b27ff). It is an invaluable observation, but one that raises two immediate questions: Are there indeed such principles, and, if there are, how do we come to know them?

¹⁴See *Metaphysics* 1.3.984b15ff: "When one man said, then, that reason was present—as in animals, so throughout nature—as the cause of the world and of all its order, he seemed like a sober man in contrast with the random talk of his predecessors. We know that Anaxagoras certainly adopted these views . . ."

The second chapter of Book II answers these questions, the first by showing that an infinite series of causes is impossible, no matter the cause. The second question—*how* do we come to know the first principles of all beings?—is answered, as it were, by being enacted before the reader. The answer is: through a course of reasoning. That this may be the more significant aspect of the second chapter of *Metaphysics* II is perhaps not often enough considered. It would be understandable for a reader to take the arguments themselves to be the sole and indeed the primary concern. It is evident that the arguments do need to succeed in order for there to be a science of the first cause at all. The alternatives are neither of them happy. Either the arguments do not succeed because there is no first cause, or they do not succeed because we do not attain the first cause by argument. In either case, there can be no reasoned-out knowledge of the first cause as cause. And, for the thinking man, the consequences of such a failure are unpalatable, to say the least. So, it is crucial that the arguments be made and made well. And indeed they are. But they are also made here in a context, that of the second book as a whole, and as a result they are—taken together—able to make an additional point, by showing it, and that point is that the wisdom that we are seeking will take the form of a science.

If it is to be a science, and not an oracular utterance or gnostic myth, this wisdom will have to be able to be taught, and taught publicly and plainly, for the knowledge of the first cause and final end will be the common good of us who live by reason. But can this science in fact be taught? There is reason to think that it cannot, for few men seek it, and many who begin the search for it turn back along the way. These are the difficulties that seem to underlie the third chapter of Book II, in which we find Aristotle's most sustained discussion of intellectual habit or custom. He presents the subject as disclosing an additional source of philosophical error and failure.

Plato had already shown in the *Meno*, among other texts, just how strongly the mind is shaped by its experience, and especially its experience of patterns of discourse. Here Aristotle seems to be taking that Platonic investigation—together with his own investigation of the principles of the subject in the *De Anima*—as having been accomplished, and he proceeds to communicate its leading results. The discussion takes its origin in the indubitable principle that “the customary is more intelligible” (2.3.995a3). In the West, we do not ask why men and women dine seated in chairs; rather, we wonder about Eastern habits of sitting on cushions or reclining at meals, for the cause is not evident to us. As in the case of habits of outward behavior, so also generally with respect to our thinking: we expect argumentative discourses to fall into certain patterns, we are offended when they do not, and we may cease to listen to them when they grate against our habits. A contemporary case in point is the philosophizing of Richard Rorty, who labored manfully, and often enough by argument, to establish the position that our minds are more effectively shaped by story than by syllogism. Rorty paid to his fellow philosophers the compliment of using a form of discourse that would be recognized and approved by them, even though he hoped to displace that very form of discourse. Aristotle faced the opposite obstacle. He had to contend with those who preferred metaphor and stirring speeches to demonstrations built up from acts of distinguishing, dividing, and defining. In the third chapter of Book II, he articulates his response to a habit of intellectual sloppiness or sloth, the conclusion of which is the crisp statement that “one must be already trained to know how to take each sort of argument.” This formulation was considerably milder than a parallel one in the *Eudemian Ethics*, where he said that “the inability in regard to each matter to distinguish reasonings appropriate to the subject from those foreign to it is [a] want of education” (EE 1.6.1217a9-10, reading

“want of education” for *apaideusia*). The solution to the difficulty, then, is that few people gain the science of truth because few have been adequately prepared successfully to accomplish the reasoning that the science demands of its students.

The overall teaching of Book II, then, seems to be that the human mind stands toward the acquisition of truth somewhat precariously. And though it be unstated, it is the virtue of humility that the book as a whole seems to inculcate, for it testifies to the weakness of the tools that we bring to bear upon the search for knowledge of the first cause. Human beings are disposed to think of themselves as autonomous as knowers: after all, no one can do our knowing for us. In Book II, Aristotle adjusts our habitual self-sufficiency in four important ways: first, by pointing out the common sources of error in reasoning and suggesting just how general or universal they are; second, by telling us that we ought to be grateful to those with whom we disagree and even those who have erred; third, by showing us just how arduous will be the reasoning that will lead us to the truth; and, finally, by warning that we must submit our minds to training in the art of thinking before they can properly serve us in the search for meaning and truth.

It remains to offer an opinion about the placement of Book II and the reason for its difficulty. It should first be admitted that this treatment of method does seem somewhat out of place coming after the dialectical inquiry of the first book. Consider, on the one hand, that it is in the initial chapters of the *Physics*, the *De Anima*, and *On the Parts of Animals*—that is, prior to the dialectical sifting of the opinions of his predecessors—that parallel discussions of method are to be found. And, as Aquinas points out in his commentary on the first chapter of the *De Anima*, it does seem fitting that a reader should be shown the way forward as much as possible before being asked to plunge down into the marshy ground that lies before the ascent, lest he fail along the

way. On the other hand, the lengthiest methodological discussions in the *Physics* are in the second book, where they seem to belong, since the discussion of the four causes profits from the earlier clarification of the principles of nature. Moreover, the dialectical discussions of *Physics* I and *De Anima* I each yield far more to the establishing of the proper first principles than do those of *Metaphysics* I, the conclusions of which are largely negative. With respect to the relationship of Book II to Book I, then, it is safest to say that one is left wondering.

As far as the question of how *Metaphysics* II relates to what follows it, here the matter does seem simpler. The repeated emphasis in Books VI and VII that we travel along the road of natural beings toward knowledge of immaterial being would seem to suffice to account for the last sentence of Book II, the three affirmations of which are all amply justified by those same later books, which stand toward Book XII as the necessary approach through the natural and material to the immaterial. Moreover, Aristotle's account of the sources of error reposes upon the first three books of the *Physics* together with the whole *De Anima*. It would seem unfitting to understand Book II to have been an introduction to the *Physics*, inasmuch as Aristotle would then be open to the charge of circular reasoning or, at the very least, of having written a preface that departed from the natural order of learning.¹⁵

In closing, it seems appropriate to offer a final reflection

¹⁵As to the question of raising the subject of truth here, rather than as a preface to the *Physics*, again the answer would seem to be presented in Book VI: "If there is no substance other than those which are formed by nature, natural science will be the first science" (6.1.1026a27ff). In that case—*per impossibile*—the *Physics* would not only have been rightly improved by the addition of some of the material contained in Book II, but also with the discussions of truth in Books IV, VI, IX, and XI, for it pertains to the highest science to discuss the subject of truth.

indebted to the late Ronald McArthur, a philosopher who devoted the second half of his life to the work of promoting the science of truth for the good of his students, and who for many years gave a celebrated lecture on intellectual custom to students at the college he helped to found.¹⁶ It seems to me that we ought to be puzzled that Aristotle, a writer so evidently concerned to be transparent with respect to the truth and faithful to the proper form of argument, should be not only able to be misread, but, what is perhaps just as worrying, able to be overlooked when offering a discussion of the highest importance for the successful pursuit of wisdom and truth. One possible explanation may be found in Aquinas's observation that Aristotle was a "student of brevity," by which phrase he was pointing to Aristotle's habits of leaving out premises in his arguments, providing a small number of examples to illustrate his points, and saying only a few times, or even once, what he thought he had said with sufficient clarity. Aristotle, moreover, seemed generally unwilling to practice the art of rhetoric in his own philosophizing, with the result that we his readers often find ourselves wishing he could have written just a bit more by way of introduction and conclusion to his treatises. He even seems to have been wary of making his dialectical arguments overly long. His time being short, perhaps he worried that the varieties of error and of unhealthy intellectual custom were practically infinite, and that what mattered was not to address every potential audience, but to address the ones that could best profit from his instruction. And so it falls to us, his latter-day expositors, to labor as best we can to prepare our students to understand his arguments.

¹⁶A version of which was published as: Ronald McArthur, "Saint Thomas and the Formation of the Catholic Mind," in *The Ever-Illuminating Wisdom of St. Thomas Aquinas* (San Francisco: Ignatius Press, 1999), 123–43.

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