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**Maritain and the Philosophy of Nature**

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## God & Nature ~ Is the Divorce Final?

Leslie Armour

The separation of the Christian God and all other gods from nature has become a passion. In the scientific community, even the thought that nature might show signs of intelligence, much less clues about its origin in a mind, is regarded by many as a major assault on the integrity of the community, by some as a return to superstition, and even by reasonable thinkers like Michael Ruse as a "science stopper."<sup>1</sup> By this, Ruse means that all such suggestions have the effect of stifling research since, he thinks, once we decide there is divinity or some other "designer" involved, we will stop the search for mundane explanations. On the fundamentalist side, the notion that intelligence might be evident in nature is acceptable, but the suggestion that we might discover something new and important about their god is not. For all we are entitled to know about the divinity is already to be found in revelation. Even believers devoted to reason tend to reject the notion that what we find by studying nature could change our views about the deity, though it is hard to know how you could find intelligence in nature without learning something about the nature of that intelligence.

The separation of scientific enquiry and religious truth goes back a long way, and the notion that faith and reason have their own domains probably has its origins in honest attempts to promote free enquiry into nature as well as to attempts to protect religion from assault by those who conducted such enquiries. Ibn Rushd, Averroes, whose work emerged on the European stage

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<sup>1</sup> Michael Ruse, *The Evolution-Creation Struggle* (Cambridge, MA: Harvard University Press, 2005), p. 281.

in our high middle ages is one of the sources of the idea that separation is necessary, and Thomas Aquinas gave it his own twist and made it almost the standard currency.

The Pakistani philosopher M. M. Sharif thought that Ibn Rushd himself, and Averroism in general, were to be found at the heart of a change in thought that was to prove disastrous. But the disaster was not provoked directly by the attempt to assign faith and reason their proper spheres or even by the related "two truths" doctrine which characterised what was called "Latin Averroism." It was, according to Sharif, provoked by Ibn Rushd's doctrine of matter.

It was this, Sharif believed, that most influenced – and led astray – the West as well as bringing disaster to Muslim thought. It is the preoccupation with matter, conceived in a certain way, that makes intelligence as a shaping force in nature seem an outrageous intrusion.

Certainly, whatever it entailed, Averroism was influential. Sharif says that despite its many official condemnations, Averroism really dominated Italian thought for four centuries, from the 12<sup>th</sup> to the 16<sup>th</sup> and led to an instructive crash in the Islamic tradition.

"From the thirteenth century onwards... there was a rapid decline. The reasons for this decline were many, but one of them was the extreme philosophies of al-Ghazali and Ibn Rushd – extreme intuitionism of the one and extreme rationalism of the other. Under the influence of the former, Muslim thought was lost in clouds of mysticism, under the influence of the latter, Western thought ran into the abyss of materialism."<sup>2</sup> It was not rationalism itself that Sharif was attacking in that sentence, but materialism.

It was not exclusively materialism, though, for Sharif's quarrel with Ibn Rushd (as I shall continue to call Averroes, since that was actually his name) included an issue that bothered Thomas Aquinas, too: Ibn Rushd did not want to admit that each of us has a distinct agent intellect. His particular form of panpsychism implied, as Sharif says, the immortality of the world soul but the mortality of the individual human soul.<sup>3</sup> Thus Sharif saw Ibn Rushd as dehumanising the mediaeval world and leading that world along the mechanical line that led to materialism. But one could argue that Ibn Rushd's theory of matter led directly to materialism.

Sharif believed – and I think there are grounds for this belief – that for Ibn Rushd, matter was not a negative reality as Ibn Sina's, Avicenna's, thought. It was not, that is, simply the limitation forced on being in order to make distinctness possible in the world, but the true reality, and the source of all power. The world was a mechanical system in which nothing was truly added

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<sup>2</sup> M. M. Sharif, *Muslim Thought* (Lahore: Sh. Muhammad Ashrhaf, 1951), p. 105.

<sup>3</sup> *Ibid.*, p. 94.

– only the potentialities already in matter could appear in the world. To make his theory acceptable to the religious community, Ibn Rushd, of course, had to urge the acceptance of his two truths thesis, the thesis religious and philosophical truths were distinct, and this, says Sharif, "was a godsend to the scientifically minded people of the world" who "were as a rule condemned and persecuted by the orthodox church and state." But the result was to debase religion, to leave it in the hands of the mystics and fundamentalists, and to encourage scientific materialism.

I think Sharif was right about the importance of his idea of matter. The change in thought that led a tailspin in Arab philosophy and that still lies at the heart of important problems in our own time did very likely come about through Ibn Rushd's view of matter. It was not, however, the doctrine of matter that worried Thomas Aquinas a little later. Aquinas was worried about Averroes' notions of the soul and the idea that we all shared in a single agent intellect, but I think people often acted as if the Averroist view of matter was a necessary part of Thomas's campaign to clarify the realms of faith and reason. I shall argue that this was a bad idea. Aquinas did not, I think, actually hold the disastrous doctrine about matter, though the distinction between the realm of reason and natural science and the realm of theology did end in a situation in which Jacques Maritain and others found it necessary to struggle over the philosophy of nature, and to find that they had difficulty getting from nature to the God of Christianity without recourse to mystical experience. Aquinas insisted that "God exists in everything, not indeed as part of their substance or as an accident, but as agent is present to that in which its action takes place." Such a god is not in things, nor do things possess properties in common with that divinity, though they possess analogies of those properties. Though one of his arguments for the existence of a god emphasises the evidential value of the fact that things work together, he would not have expected that the study of cell biology in its particular details would give us information about divinity which we could not infer from abstract nature of the causal system of things, though he would have been interested in some things that biologists have lately discovered. At any rate, a struggle to get the philosophy of nature in its right order occupies most of Maritain's *Distinguer pour unir*,<sup>4</sup> surely his masterpiece, and the book ends with appeals to mysticism.

I am not alone in thinking that the ontologies involved in some widely accepted forms of the separation of the domains that belong to students of nature and those that belong to students of theology have led to disaster. John Haught, the director of Georgetown University's Centre for the Study of

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<sup>4</sup> Jacques Maritain, *Distinguer pour unir ou Les degres du Savoir* (Paris: Desclée de Brouwer, 1932).

Science and Religion, began a recent book by recalling that Hans Jonas said just before his death that philosophy has yet to produce an ontology adequate to evolution.<sup>5</sup> Haught comments: "Materialism, the belief that lifeless and mindless 'matter' alone is real has provided the philosophical setting for most evolutionary science.... Alfred North Whitehead had already demonstrated that the reigning materialist metaphysics... choked out any sense of emergence novelty."<sup>6</sup> One does not have to agree with Whitehead or Haught to suspect that the problem of an effective ontology might lie with ideas of matter so conceived as to draw a sharp line between intellect or intelligence and the workings of nature.

In point of fact, Aquinas himself was clear that form has "more being" than matter and matter is not anything in any ordinary sense. He says that "matter is what in itself, i. e. considered according to its essence, is neither a what, i. e. not a substance, nor a quantity nor something belonging to other genera by which being is determined or divided."<sup>7</sup> And so his view was nearer to that of Ibn Sina, one of Sharif's heroes, who thought that matter is a limitation on form than to Ibn Rushd who thought it was something in itself. But we must be careful. I said that I think Sharif was right about Ibn Rushd on matter, but the issue is very subtle. We are on slippery ground here. Near the beginning of his *Kitab al-Nafs*, Ibn Rushd concedes that matter is only the potentiality to take on form, but he insists that the forms we find in matter have no existence outside matter.<sup>8</sup> In Aristotle though, the forms inform matter and do not exist in some Platonic garden by themselves, they are not merely confined to the objects informed by them in the material world at any moment, but also act as formal causes, and the universe is so organised that they have an intelligible propensity to manifest themselves. In Aquinas, of course, there are exemplary ideas in the mind of the Christian God and everything in matter directly reflects that mind in some way. Furthermore, forms abstracted from matter have an existence in our minds as the basis for our knowledge of things, Ibn Rushd seemingly reads Aristotle so as to create a greater degree of independence for matter, and this is likely crucial for our

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<sup>5</sup> John Haught, *Mortality and Morality* (Evanston IL: Northwestern University Press), p. 52.

<sup>6</sup> John Haught, *God After Darwin* (Boulder CO: Westview Press, 2000), p. 1.

<sup>7</sup> Thomas Aquinas, *Commentary on Aristotle's "Metaphysics,"* 7.3 (1029a5-30), on substance and prime matter, tr. by Peter King. Reproduced here from a University of Toronto web site.

<sup>8</sup> p. 8 in the edition cited by Ahmed Fouad El-Ehwany edited by himself, Cairo, 1930, and discussed in his article on Ibn Rushd in M. M. Sharif, ed., *A History of Muslim Philosophy* (Wiesbaden: Otto Harrassowitz, 2 vols., 1963), pp. 540-564. The reference to matter is on p. 552.

story here. The point for our story is that in the *Kitab a-Nafs* the ground is laid for the doctrine that is now often taken as standard: we cannot look to nature for any sign of god because the forms exhibited in nature have no place beyond the realm of material things.

Jacques Maritain, who would surely have said that he was reflecting on Thomas, also urges us to remember that "what philosophers call matter (the existent non-being of Plato) is in the last analysis nothing other than the ontological source of relative unintelligibility." But he adds darkly that matter "signifies the distance which separates [material things] from the intelligibility in pure act." The objects of science are discovered "by the operations of the intellect that are freed from matter."<sup>9</sup> This suggests on the one hand a separation of the world from the "pure act" that is Maritain's God, and on the other, the dark side of things as they are in themselves. Is anything left unknown after all abstraction? In any case what be known about the originating being of the universe from the material world is what can be learned, according to Maritain, at the third level of abstraction, beyond the most empirical sciences and mathematics and at the point where it is the being of things as such that becomes apparent.<sup>10</sup>

This suggests a struggle for a satisfactory doctrine, and the issues raised here will emerge more clearly as we go along; but first, let us look at the shift in Arab philosophy and, as it happens, its Christian background. Ibn Sina was a Neoplatonist, but his view of matter seems to trace back to Gregory of Nyssa, who entered the Arab world via philosophers in Baghdad, especially, perhaps, Dirar bin Amr.

Gregory of Nyssa was in one sense of the term an idealist. The nature of Gregory's idealism is, however, a matter of dispute. He has been likened to Bishop Berkeley but it is not the idealism of Berkeley's *Principles* and *Three Dialogues* that comes to mind but the more Neoplatonic Berkeley of the *Siris*. Gregory did not deny that there were material objects. What he held – as did Berkeley in some of his most read works – was that material bodies are only collections of qualities and that the qualities are in turn thoughts or concepts which have their origins in the mind of God.

Our world, however, is organised and has an objective structure which all minds share. Gregory speaks of this as a "substratum" in which these qualities in our world somehow inhere. Darren Hibbs, in his *British Journal for the History of Philosophy* paper thinks of this substratum as a "point of

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<sup>9</sup> Maritain, *Distinguer pour unir*, p. 70. In the English translation by Bernard Wall, *The Degrees of Knowledge* (London: Geoffrey Bles, 1937), p. 44.

<sup>10</sup> *Ibid.*, pp. 73-74; translation, p. 46.

confluence for qualities."<sup>11</sup> And perhaps this suggests something other than idealism.

Such a "substratum," however, would be a Neoplatonic emanation, the expression of the mind of God in a world which is distinct from him. Our minds are part of the same emanation or system of emanations and so we share in its structure. Thus the idealist point seems to be sustained.

It remains true, that is, that for Gregory the world can only be understood as being dependent on a mind.<sup>12</sup> His fundamental argument was that, if anything like the Christian God exists, the things in the created world could not be wholly unlike their creator. They would have to bear the mark of divinity and in some way share in the divine nature. This, of course, is the very view that is now so widely under attack. But Gregory argued that the separation would make creation unintelligible.

Gregory is arguing from what he believes about the Christian God to what he believes about the world. But the argument can readily be reversed. What we perceive in the world are, as Gregory says, collections of qualities. We believe that something holds them together and that this is what gives them their intelligibility. This intelligibility can readily be understood as the substratum of which Gregory speaks, but the intelligibility would seem reasonably to be the intelligibility that comes from an intellect.

Richard Sorabji associates Dirar bin Amr (the Baghdad philosopher who lived around 800) with Gregory of Nyssa and cites Fritz Zimmerman as

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<sup>11</sup> Daren Hibbs, "Was Gregory of Nyssa a Berkeleyan Idealist?" *British Journal for the History of Philosophy*. Vol. 13 no. 3 2005, pp. 425-435. The quotation is on p.433.

<sup>12</sup> There is a theological argument that underlies Gregory's position. The clearest statement of it perhaps is in *De Hominis Opificio, Patrologiae Cursus Completus, Series Graeca* (Paris: P. J. Migne, 1858), vol. 44, col. 133 AD. There is an English translation by H. A. Wilson in *Select Writings & Letters of Gregory, Bishop of Nyssa: Nicene & Post-Nicene Fathers, Second Series*, Oxford, Parker, 1893, Vol. 5, pp. 413-414. Richard Sorabji calls attention to Gregory's discussion in his commentary on the *Hexaemeron* of his brother Basil. The Greek text cited by Sorabji is in *Patrologiae Cursus Completus, Series Graeca* (Paris: P. J. Migne, 1858), vol. 44 Col. 69-BC. There is a Latin version in the Migne edition and a very influential one, *In Hexaemeron commentarius*, ed. Petro Francisco Zino, (Venice: Aldi filii, 1553). The argument is that God would or could not create things wholly different from himself, and so would not create material substances, but only material properties that depend on minds, so "none of the things we call a body is on its own a body." That is, things that appear to be material turn out to cease to exist if the supporting minds are withdrawn. Sorabji likens Gregory to Bishop Berkeley, though as I noted this has been disputed. Gregory's idealism is also to be found in *De Anima et Resurrectione*, translated in *Select Writings & Letters of Gregory, Bishop of Nyssa*, vol. 5, p. 445 and in *Patrologiae Cursus Completus Series Graeca*, vol. 46 col. 124 BD.



providing evidence that Gregory's writings were available in the Arab world in Dirar's time.<sup>13</sup>

This view is consistent with the conclusions of H. M. W. Alousi, a recent scholar, and with the reports of Dirar's near contemporary al-Jahiz about the work of Dirar.<sup>14</sup> Dirar also believed that bodies are collections of perceptions.

Dirar has become a shadowy figure and Sorabji thinks his idealism may have been exaggerated, but Alousi has found references in al-Jahiz's *Kitab al-Hayawan*,<sup>15</sup> a notable work of the time, asserting that Dirar spoke of things as being created "only as seen." Dirar and Gregory were at one: There is no separation of God and nature, and cannot be. Ibn Sina simply continued to build on this tradition.

To say this, however, is to state a problem, not to solve it. Both Gregory and Dirar thought they knew certain things about God, a lot about our experience, and only such things about nature as they could infer from practical life or by interpreting their experience in the light of their philosophies, their theologies, and their religious revocations. Platonism and Neoplatonism were their natural allies in any attempt to build a picture of the world. Aristotle did not seem an alien thinker, but someone from whom they could draw arguments as they needed. Like Plotinus himself they did not in any case see Aristotle and Plato as related in quite the way that many scholars beginning in the high middle ages did. To some extent the changing view of Aristotle must be attributed to Ibn Rushd and the Arab community. The availability of texts no doubt played a part, but the separation of faith and reason clearly had something to do with the way in which one read Aristotle on matter even though thinkers like Thomas Aquinas approached it with great caution.

What was at work was a combination of a desire to open thought to new knowledge and a natural consequence of certain kinds of theism. The change from polytheism, taken for granted by the Greeks even if skeptically by their philosophers, to monotheism brought a range of demands to conceive of a god who was separate from the world and from all earthly spirits who might

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<sup>13</sup> Richard Sorabji, *Time, Creation & the Continuum* (London: Duckworth, 1983) pp. 295-296.

<sup>14</sup> H. M. W. Alousi, *The Problem of Creation in Islamic Thought* (Baghdad: National Printing & Publishing, n.d. [The British Library gives 1965 as the date]). The cover & title page reads Husam Muhi Eldin al Alousi, but the British Library gives the author's name as Alusi, Husam Muhyi al-din.

<sup>15</sup> Al Jahiz, *Kitabal-Hayawan* (Cairo: al-Halabi, 1938), ed. al-Salam Muhammad Harun, vol. V, pp, 10, 12, 13 . "al-Jahiz" was the common name of Abu Uihman Amr Ibn Bahr al-Kinani al-Fugaimi al. He was born in Basra in 776 and died in 869. His book contains a pioneering theory of evolution in which the issue of animal minds and bodies is discussed.

be deified. Judaism banned representation of the deity and insisted on narrow channels through which, exclusively, the deity might be approached. The idea that there might be intermediaries between us and God did not wholly die out in all parts of the Jewish community, but it became at least a dark subject. God still spoke to his people and promised a Messiah, but communication was mainly through the scriptures and, after the fifth century B.C., gaining acceptance as a prophet certainly became difficult and in some people's eyes virtually impossible. Islam, when its turn came, took this process further. God spoke to Mohammed and dictated the Koran, but he was not to be represented in any way,

In between Judaism and Islam, it would certainly seem that Christianity amounted to an attempt to restore personal relations with the deity. For the Trinitarian doctrine has it that God appears among us as one of us. To locate himself in the natural world clearly shows a regard on God's part for nature and, as Cardinal Bérulle and many others have argued, a humility that transforms all our relations. Christianity with its rich cast of saints also established a great many lines of communication through which believers might seek interventions in the world, and Christian art brought divinity itself into view. The Reformation recoiled from much of this, and we may well ask why.

Is it because the separation of realms begun in the high middle ages had become a deeply entrenched pattern of belief so that it seemed to the reformers a part of the "real religion" and the observable traces of god in the world seemed doubtful? Certainly by the Seventeenth Century thinkers like Thomas Hobbes and the practitioners of the new sciences had come to think of matter as something much more than the non-being described by Thomas Aquinas or indeed, than the "ontological source of relative intelligibility" mentioned by Maritain. The relevance of the forms espoused by Platonists and Aristotelians in their different ways disappeared from the sciences. So matter had to take on more and more of a life of its own. Even Maritain's matter seems a little richer than Thomas's. Hobbes still claimed to believe in god, but how he managed it he never made clear. God has disappeared from the Hobbesian world. He may be looking at it with a jaundiced eye. But he is not directly apparent in the objects that we see. Still, whatever Christian doctrine may say, Maritain's God is not among the objects that people Maritain's world, either.

The much older view, that of Gregory of Nyssa, Dirar bin Amr and perhaps Ibn Sina also makes a comeback in the Seventeenth Century, however. Nicolas Malebranche said we see all things in God and Bishop Berkeley spoke of nature as "natural language of God."

But notice that difference is, indeed, in their views of matter. What one believes Berkeley thought about matter may depend on what book one reads. In the *Principles* and the *Dialogues* matter most often seems to be a collection of perceptions in the mind of God. The notion of nature as the natural language of god appears in the *Principles*, too. That idea of a "natural language" is developed in *Alciphron* and then, perhaps, matter is just the stuff of god's alphabet – a collection of symbols. In the *Siris* matter is more nearly, as it was for Gregory, an expression of Neoplatonic ideas, so that the world expresses God's mind in a slightly different sense. Malebranche and Berkeley shared some notions – as one may learn from reading Canon Luce<sup>16</sup> – and, for Malebranche, matter, though real, is an expression of the divine ideas, distanced from his God no more than my idea of the computer on which I am writing is distanced from me.

The suggestion in these theories is that we can learn about a specific god – the Christian God – by studying specific elements in nature and not merely by abstracting from our ideas of nature and reaching the concept of being. There is no residue of Averroist matter as something real in its own right or even of whatever it is that we abstract from in Maritain's sense. There is no sense in such theories that there is no nature to be studied, only that whatever matter is, it gets its reality from the expression of the divine nature. The divinity which is expressed is clearly an intelligence.

The question, of course, is whether or not an intelligence really is expressed in nature and, if so, how we might find out. Of course if one believes on any ground that there is a god who is the author of nature one will believe that an intelligence is expressed in nature, but it would not follow from that we could find it there or that the study of nature would confirm our theistic hypothesis.

So what are we looking for? I think first of all we are looking for signs of bias in the universe, the kinds of bias that suggest that intelligence and

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<sup>16</sup> A.A. Luce, *Berkeley and Malebranche* (London: Oxford University Press, 1934). Luce's *Sense Without Matter* (Edinburgh: Nelson, 1954) gives the exposition of the case for Berkeley as he is most commonly understood by readers of the *Principles of Human Knowledge* and the *Three Dialogues Between Hylas and Philonous*, but the notion that nature is the natural language of God runs through Berkeley's writings. In *A New Theory of Vision*, Section 147, p. 51 of *George Berkeley, Philosophical Works*, ed. M. R. Ayers (London: Dent, 1975), Berkeley says: "Upon the whole I think we may fairly conclude that the proper objects of vision constitute an universal language of the Author of Nature." In the first edition the text read "the universal language of Nature" The same line can be in *The Principles of Human Knowledge*, first published in Dublin by Jeremy Pepy in 1710 §65. The idea is expounded in important ways in *Alciphron or the Minute Philosopher*. In the Fourth Dialogue, Section 7, *Works*, ed. A. L. Luce and T. E. Jessup (London: Nelson, 1948-57), Vol. III, p. 149.

intentionality are at work. There are two questions, here. The first is: Is there any bias? And the second is: Is it the kind of bias that would result from the exercise of intelligence? It would be most convincing if we were to find signs of a plan.

The answer to the first question is that there is and has to be some bias. To say that something happens purely by chance is to say that it is likely as not or as unlikely as not. If there is no bias for or against an event, then the probability of an event is  $\frac{1}{2}$ . This is called the principle of indifference. If there are two such events, the probability that they will both occur is  $\frac{1}{2} \times \frac{1}{2}$  or  $\frac{1}{4}$ . But the probability that at least one will occur is  $\frac{1}{2} + \frac{1}{2}$  or 1. If we had three such events the probability that at least one would occur would be  $1 \frac{1}{2}$  -- and that is a contradiction.<sup>17</sup> So in any universe in which there are three or more possible events, there has to be some bias. We know by observation that we live in such a universe, but we also know something about biases. A die is a little universe with a bias, because it has six sides and you have one chance in six of rolling any number given numbers between one and six just as you have one chance in 52 of pulling the Ace of Spades out of a standard deck. But the way a cube lands allows simple reckoning, because only its uppermost side is relevant and it is designed so that it will always land with one side uppermost. Given all we know about it, we are fairly safe in saying that its bias is designed. With respect to a whole universe, however, very many properties reveal themselves as it unfolds and at every stage there are apparently many possibilities. Two properties may be especially interesting for our enquiry, however: complexity and organic unity. Successive states may show more or less complexity and more or less organic unity. A steady movement in one direction or the other would indicate a bias. It need not be a direction without exception. Individual organisms, for instance, tend to become more complex when they are in their growing phases and then become disorganised and die. And, of course it is only the observable features of the natural world that we can pronounce upon. What goes on inside black holes involves speculation, what goes on in other spaces and times, if there are any, is unknown to us.

With life forms we have a lot of data. The oldest life forms we can observe seem to be unicellular and there has been steady development since involving more complexity, at least up to the appearance of mammals like us. We also know quite a lot about the observable features of the space-time system in which we live. The simplest atom is hydrogen, but many much more complex

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<sup>17</sup> This is a notion advanced by John Maynard Keynes and discussed by Bertrand Russell. See Russell, *Human Knowledge, Its Scope & Limits* (London: George Allen & Unwin, 1948), pp. 391-392.

atomic structures can be developed from it. Our present universe shows a great deal of atomic complexity.

Living creatures are collections of such atoms, but in cells we find very close unities and dynamic systems that constantly adjust to sustain life. Multicellular creatures have organic unities characterised by the fact that very many individual components work together in mutual dependence and in a constant process of adjustment. Still closer unities seem to develop as mind appears on the scene.

There is now a very strong tendency for social processes to bind the whole world together in a unity which we have discovered no successful means of managing – and which we mysteriously try to manage by harnessing the forces of industrial capitalism. But those forces are designed to give profit and power to individuals in a way that opens increasing gaps between rich and poor people and between rich and poor societies. If real unity comes it seems it will have to arise out of a different vision of the possibilities for organic unity.

There are forces that make us move toward social unity or face extinction. But they are paralleled by another tendency: the tendency for individuals to have more choices and for individuality to become more marked. This, of course, exacerbates the problems. Mind permits self-awareness and reflection and the building of individual interests, but they can be developed only in a social context. If we understand this we may begin to see a way out.

But what would make one think this bias is related to a divine intelligence?

Within whatever biases there are, certain things happen. Within the biases of the cards royal flushes occur in poker. It seems very likely, though, that they occur with just the frequency that our probability theories agree on even if the notion of probability remains somewhat problematic. It is perhaps much odder that some processes that lead from, say, the amoeba to us should happen to have the results that they do. Of course, life did not develop in a simple linear way. Life forms came and went. There were dead ends and regressions to simpler life forms. The process may work through Darwinian "natural selection" provoked by mutations of genes and the tendency for organisms well adapted to their environments to survive. But as Jerry Fodor has pointed out, one who ascribes this to random chance runs laughably against the odds of probability.<sup>18</sup> We can certainly laugh at probability if we want, but let us think a little more about chanciness.

We are talking here about the probability that events within a universe that admittedly shows a bias might all still be chance events within the scope

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<sup>18</sup> Jerry Fodor, "Climbing Mount Improbable," *London Review of Books*, Vol. 19, No. 8, April 18, 1996, pp. 19-20, reprinted in *In Critical Condition* (Cambridge, MA: MIT Press, 1998), pp. 163-170.

of the bias, as throwing snake's eyes or craps is an event within the probabilities determined by the form of the dice.

What of the possibility that a whole universe *with the biases we think we detect* should just happen by chance? It is often said that from a scientific point of view the universe just happens. Astro-physicists are not quite content with the notion that before the big bang there is nothing. Logically this seems to mean that universes might spring spontaneously from nothing. But if that can happen, anything can happen. If universes can spring spontaneously from nothing, why should lesser things not do so as well? Perhaps then the explanation for anything might be that it "just happened." The answer to this complaint – the complaint that allowing a big bang opens the door to anything whatever is that once you have a universe at all what there is gets in the way of other things and structures the balance.

It is on this account that people in the sciences think they have a chancy beginning and still do not think they must abandon all explanation. But how are we to look at the structure of what gets in the way of mere chaos or simple randomness? Does the study of what there is give us any clues?

Consider: There are not usually tigers in London outside the zoo and the circus because the conditions are not right for tigers. The conditions are rather complicated. They include not only a somewhat more suitable climate but also such things are being at the right point of the evolutionary chain.

Jerry Fodor, as I said, thought chance wouldn't take us all through the evolutionary chain. But if one concedes that probability makes us expect that things do happen against the odds – people in poker games do sometimes draw into a royal flush – how much that's against the odd is admissible? Is there any way of answering such a question?

Certainly scientific investigators want to talk about repeatable processes if they can. For the ability to do the thing over again is a test of many scientific hypotheses. Those who think that life arose naturally think that, given the right moment in the history of the cosmic soup, life sprang from lifeless chemicals – and we would do again. There are those, however, like Stephen J. Gould, who think it might have done so, but might not do so again – that neo-Darwinian<sup>19</sup> evolution may well depend on non-repeatable events.<sup>20</sup>

Neo-Darwinian explanations then become no more than saying "it happened and it could have happened by natural selection." But Gould thought, of course, that the model was like the luck of drawing into an inside straight in a poker game.

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<sup>19</sup> Darwin's theories combined with later theories about genes and chromosomes are generally dubbed "Neo-Darwinism."

<sup>20</sup> Stephen J. Gould, *Wonderful Life, The Burgess Shale and the Nature of History* (New York: Norton, 1980).

People once believed in spontaneous generation. No one does now. If life can be generated from random mixtures of chemicals why doesn't it happen quite often or at least within the laboratories of those who believe in such things? The answer is that no one has been able to say exactly what the necessary conditions are.

Let us then look at the next episode of the story. Suppose life could be generated. Such life might be a virus (which seems simplest) or a unicellular organism. There are, though, those like Michael Behe<sup>21</sup> who think that the simplest cell is "irreducibly complex." That is to say that you can't get from a pile of chemicals to a cell just by adding bits because there is nothing simpler than a cell from which a cell could be derived. There is much argument about this.

In any case, to get from bacteria to tigers, of course, one would have to have multicellular creatures. There are some oddities involved. Creatures like us have cells powered by mitochondria. Unicellular creatures generate power by manipulating the inner and outer membranes which surround them but not enough power could be generated that way to run very complex creatures. Our mitochondria have, however, DNA which is different from the rest of our DNA. They were once separate organisms. How they got into their present condition and traded off some of their genes so that though they are still distinct we cannot propagate them on dishes outside cells is a mystery. The appearance of mitochondria powered eukaryotic cells = cells with nuclei – is called by Nick Lane "the arrival of a "hopeful monster." It happened 2,000 million years ago, through the merger of two cells, one of which continued its life inside the other. Without them we would not now exist. Yet it is an event that seems to have happened only once.<sup>22</sup> He thinks it is a once in a universe event and a major objection to the hope of generating complex life in the laboratory. Be that as it may, mitochondria will play an important role in our story for quite another reason: they pose a problem about how we identify different life forms.

People, then, keep turning up sobering facts about chance and the universe. We have seen at least that the universe does have biases and that we may be able to guess what some of these biases are like. But this does not take us very far.

The question is: what does what we know about bias in nature tell us about the likely nature of its inner well-springs, of whatever explains the bias and what we would need to know more about it? Perhaps we can even detect a

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<sup>21</sup> Michael Behe, *Darwin's Black Box Biochemical Challenge to Evolution* (New York: Free Press, 1996).

<sup>22</sup> Nick Lane, *Power, Sex, and Suicide* (Oxford: The University Press, 2005), especially p. 23ff.

direction in things, but what we would like to see is a sign of intelligence. But if it does show intelligence at work it must also show some values. When we look at bridges and tall buildings and aeroplanes we get some idea of what the people who built them had in mind. It is not always so. Getting a glimmering of the minds of those who built the great figures on Easter Island has proved very difficult, and Stonehenge remains a subject of entertaining speculation. It is always possible that whatever designed the universe, if anything did, had values unimaginable to us. It is said that the Cambridge mathematician G. H. Hardy once remarked that our planet seems to be the only thing in the world with strange fungus growths on it and that a deity might regard it as merely unsanitary. In that case our attempt to fathom the mind of a cell-designer from what we know of cell biology would be wholly misguided.

But we may know something. Alfred North Whitehead noted that everything in the universe has a mental as well as a physical pole.<sup>23</sup> By that he meant that there is an inner process that reaches out into the world. He thought that the world was composed of events rather than of substances and that everything we need to talk about has a measure of indeterminateness. Nothing is a perfect or exhaustive example of the idea or concept by which we identify it, and everything has a certain openness which he thought of as a degree of freedom. Notice that in raising these questions we are not saying that the world has inexplicable gaps and then filling them with an unexplicated god. Keith Ward, an Oxford divinity professor, recently accused Michael Behe of doing this,<sup>24</sup> and indeed Behe opens himself to this accusation by saying he knows nothing scientifically about the designer of his irreducible complexity. The point here is to try to find some intelligible pattern in the whole of nature – one that, if it existed, would require a *different mode of explanation*, one that if a god is too involved logically points to an appropriate god.

The thought here is that things have an inner side and that the inner side reveals a mind at work. Famously, Pierre Teilhard de Chardin in *The Phenomenon of Man* opened the notion of a "within" of things.<sup>25</sup> But he was

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<sup>23</sup> Alfred North Whitehead, *Process and Reality* (New York: Macmillan, 1929), "corrected" edition, ed. David Ray Griffin and Donald W. Sherburne (New York: Free Press, 1975). The "mental pole" is introduced on p. 45 but reappears throughout the book.

<sup>24</sup> Keith Ward, "Beyond Boundaries, The Infinite Creator," *The Tablet*, September 2, 2006, pp. 6-7.

<sup>25</sup> Pierre Teilhard de Chardin, *The Phenomenon of Man* (London: Collins, 1959), Chapter II, Book One.



not alone or the first to do so. John Scott Haldane had raised the same suggestion in 1935.<sup>26</sup>

These are not easy notions to understand, much less to sustain. We are aware that the world as we see it in our reflective consciousness is individual and particular and cannot be reduced to the world that others see from the outside. At one time many people believed that we could, for scientific purposes, dispense with the inner side and learn all there was to by studying the external behaviours of things and people. Behaviourism was popular in psychology and in the social sciences. People could take this seriously only at a certain level. and there is an old joke about the two behaviourist psychologists who meet and one says to the other "you're fine, how am I?" Behaviourism has faded in those fields but there are still philosophers, of course, who think the inner life is a kind of mirage, merely a way that matter appears in certain circumstances or that its phenomena are epiphenomena – that is, that they have no real independence. Perhaps, like optical illusions, they have no objective existence. Optical illusions do, though, have a real place in our inner lives.

Very big questions are involved. I have written about them extensively elsewhere,<sup>27</sup> and I can only note here that there are various properties which cause us to take the inner life seriously. If I say I saw a little green man with antennae growing out of his head descend from a space ship, there will be a legitimate debate about whether there was something else which my perceptive powers organised into that shape, but the question of whether I saw it or not is one that only I can answer, even though I am limited by the fallibility of memories and limitations of my language and its concepts.

But let us pursue the matter. If I ask you to imagine a round red patch you can probably do so. It may be that in some sense you are really seeing one of your brain states, but that has to be a rather *Pikwickian* sense. For I can ask if what you saw was really round or perhaps looked a little ovoid, but there are no round or ovoid brain states.

So there is an inner side to our lives, and we are quite sure our dogs have inner lives, too. It is a good guess that the Sparrow who hangs about with his mate on the British Library terrace in search of crumbs from Kit-Kat bars has an inner life, too. Charles De Koninck brought this problem home to us in *The Hollow Universe*,<sup>28</sup> De Koninck's basic argument was that science presents us

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<sup>26</sup> John Scott Haldane, *The Philosophy of a Biologist* (Oxford: Clarendon, 1935), second edition, pp. 72-74; there was a second edition in 1936,

<sup>27</sup> See Leslie Armour and Edward T. Bartlett III, *The Conceptualization of the Inner Life* (New York: Humanities Press, 1980).

<sup>28</sup> Charles D. Koninck, *The Hollow Universe* (London and Toronto: Oxford University Press, 1960); Québec, Presses de l'Université Laval, 1964.

with a universe of abstraction. Unless we understand the principles on which it is built and the sense in which it cannot be the whole of reality, we are apt to mistake a hollow shell for the whole of reality. Part of the problem is the dominance of calculation in which our concern is not with things as they really are but with what we can do with them, and hence with the external natures. Science also tends to substitute the formulae which govern calculations for descriptions of reality. This is not a criticism of science, but of the misunderstanding of its nature, and of its misuse.

One of De Koninck's important examples concerns life. He wonders why live animals in the zoo are more interesting than dead ones in a museum. Our purely scientific descriptions may make it appear as though "life" is not something which can figure in knowledge. His book, is, in effect, a plea for the construction of an adequate philosophical framework within which science can be understood, and it was towards the construction of this framework that most of De Koninck's later philosophical work was directed.

No one quarrels with De Koninck about lions and tigers but, as we go down the evolutionary line to much earlier life forms, we become doubtful. Do the mitochondria in our cells have an inner life? What went on when they first entered a cell, entered into the co-operative living arrangements, and made possible the eukaryotic cells that in turn enable complex living things to develop?

John Scott Haldane as much as Teilhard wanted to say that the germ of the inner life goes all the way back and is part of evolution. He was less often shot at by his biologist colleagues than Teilhard de Chardin was to be later, perhaps because he had the advantage of not being a Jesuit, though he did have a tendency to talk about god. In any case, their thesis is the old one: *ex nihilo nihil fit*, out of nothing, nothing comes. If there is an evolutionary story it includes everything. In that case, consciousness is the reflective outcome of something that has always been there.

If that is so, we can see a continuous process which, again, seems to have a direction. Samuel Alexander thought ahead of us in time was the development of "deity,"<sup>29</sup> though he thought that deity never quite emerges. In this way, he was on the same track as Teilhard, though Teilhard thought deity would emerge and indeed, in one sense, had been present all along.

What can we make of such arguments? What is their logical structure? Do they really close the gap between god and nature?

They are extrapolations from data which are in dispute. Worse, they do not close the gap because whatever emerges as the ultimate form of consciousness might be a moral disaster. After all, we have now subverted or

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<sup>29</sup> Samuel Alexander, *Space, Time, and Deity* (London: Macmillan, 1920).

at least brought to an end the processes of evolution in the sense that we now dominate the planet and contemporary genetics probably allows us to determine our own future. The human mind has so far shown itself to be rather destructive.

Using evolutionary development for theological ends also raises, in many people's minds, suspicions of heresy. There is a suggestion sometimes put forward explicitly as it is in the work of Samuel Alexander and Teilhard de Chardin that divinity develops along with the world. If divinity puts itself in the world it is hard to know how one can insist that divinity does not change as the world develops. Of course, one could try to square this with Christianity, for the Christian God does make a personal appearance at a particular time and will appear again, it is said, at or near the end of time, but to say this still leaves us with the notion we actually learn about a Christian God by studying evolutionary biology. Not everyone is happy with that. The unhappiness of believers with such a notion is not philosophical or my concern here. But an evolutionary god does pose philosophical questions about just how one is to delimit the concept of god so that one can tell whether nature does or does not provide evidence of divinity. If our concepts of god are defined essentially by reference to a theological tradition, there is every likelihood that they cannot be made to mesh with any scientific evidence.

In any case, however, the gulf between god and nature cannot be spanned so easily as the theological evolutionists sometimes seem to suggest. And this is true for two different reasons. One is that we have gone on from Averroism to insist on a distinction between facts and values. It seems a natural move. The concept of god that permeated the work of the Arab philosophers at least up to and including Ibn Sina and that of the Church fathers was imbued with the Platonic idea of the good and the Aristotelianism which followed did not break that bond. If the Averroist matter was something in its own right, then it was separated from that value. If the forms that it could take on were such that they could exist *only* in matter — as the reading of Ibn Rushd I have been following insists — then they have to be comprehensible without values.

The separation of facts and values is often located in the Seventeenth Century and it certainly has connections with the materialism of thinkers like Thomas Hobbes and received support from those who read Descartes as insisting that what science studies are measurable properties of things. For we cannot weigh goodness or put a tape measure on it. But the split between facts and values no doubt has roots going back much further. If science has no truck with values one will not find traces of any god in nature. And so, as I suggested, even if one finds a bias in nature not only toward complexity but also toward consciousness, the enrichment of the inner life, and the freedom

that allows us to dominate nature, it does follow that one will have found any traces of god.

Traces of god would have to be traces of a purpose, a purpose sufficiently rich so that we could say that it was intelligibly the purpose of a plausible deity. This would mean that one would have to read nature as revealing a story. Facts, if they are supposed to be stripped of values, do not, of course, provide any such story.

The truth of the matter, however, is that the appearance of facts as stripped of values, may well be achieved in the biological realm only by a kind of sleight of hand. We need to think for a moment of how it is that we divide up the biological world and provide ourselves with the data which we then link with evolutionary theories. The days when biology was largely devoted to naming and classifying life forms are certainly long gone. Yet very much still depends on getting classifications right.

How is it that we decide that dogs and worms are two different species while the myriads of cells in your body constitute a single organism? The answer, of course, is that, though many of your cells can live independent lives and be cultured by researchers, they all work together for some single end whereas the dog and its worms have aims which clash. We may identify your various cells by common patterns in their DNA, but every one of your cells has mitochondria without which it could not survive and which have different DNA. Indeed, the mitochondria – which were once distinct creatures in the evolutionary tree – co-operate with their host cells. They have co-operated to such an extent that they have engaged in genetic transfers so that attempts to breed them outside a cell have up to now failed. Yet they can live in the culture dish.

In a larger way it is difficult to imagine understanding the workings of a human heart without grasping its functions or to imagine medicine without taking account of such purposive activities. So values do in one way or another enter into accounts of the biological realm.

Can we substitute the language of random chance for all the occasions in which we introduce values? This in itself seems to be a decision about values. Physicists lately have been interested in the fine tuning of the universe. A very slight change in any of the conditions would have resulted in our not being here at all. Fine tuning has implications for the idea of purpose

But all this again takes us only a little way. And we tend to duck such issues. In our scientific studies we prefer some kinds of explanations rather than others partly because we have a tradition of preferring explanations without values. The issues raised by Michael Ruse, whom I mentioned at the beginning of this paper, are relevant here. One reason that those who practise the sciences have a distaste for any explanations which have theistic or deistic

implications is, as Ruse says, because they believe that such explanations bring scientific research to a halt.

There is no reason that this should be so. If, say, Michael Behe is right and there is a case to be answered about irreducible complexity we can search for more and better examples, try to show weaknesses in existing examples, and of course investigate the contexts in which cases of irreducible complexity arises. All that sounds as if it is part of ordinary everyday scientific activity. If Behe's case is demolished we will learn something along the way, and if it is not demolished, we may have to do some rethinking.

What may be dispiriting is that if Behe were right we would have a new mystery on our hands. As I noted, Behe does not claim that he can reason his way to a Christian God, much less find out anything about any god. He says only that there seem to be signs of intelligent design. Is this a dead end?

Explanatory patterns *do* tend to land in dead ends. The child told that God created the world naturally answers by demanding to know what created God and is not likely to be mollified by the answers. Physicists, who have now taken the side of the Christian philosophers against people like Ibn Sina who thought the universe was eternal, seem content to say that nothing happened before the big bang.

There are long and short answers to these conundrums. I have given a long answer elsewhere,<sup>30</sup> but the short answer is that whatever you postulate one entity as the explanation of another, it is legitimate to ask for an explanation unless the only alternatives are all logically contradictory. It would seem to be true, then, that if we are not to have endless infinite regresses we would have to have a necessity at the end of our line of explanations. Now a god might be logically necessary in some sense, though the big bang is not. But Thomas Aquinas, unlike Anselm, did not think we could see into the essence of this necessity and indeed, in the sense of a Christian God who did all the things Thomas believed in – came among us as a man, for instance – he is certainly right.

A necessary entity is something that cannot come into existence or pass out of it, but anything which we might call a being is subject at least to logical limitations and can not be shown to be necessary in that sense. Goodness, though, is another matter. You can create good things, but not goodness itself, or what Plato called the form of the good. Nor can you destroy it, however many of Mr. Bush's aeroplanes and tanks you deploy.

John Leslie and I have therefore suggested that the universe exists because it ought to.<sup>31</sup> Of course, as I have argued, if that is true then one of the things

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<sup>30</sup> Leslie Armour, "Values, God and the Problem About Why There is Anything at All," *Journal of Speculative Philosophy*, (New Series), Vol.1, No.2, 1987, pp.147-162.

<sup>31</sup> John Leslie, *Value and Existence* (Oxford: Basil Blackwell, 1979).

that ought to exist is a God of the sort that I think Christians do or ought to believe in. A Cudworthian God whose nature is love and who "governs sweetly."<sup>32</sup>

This, of course, is a speculative theory. There are no objections to those, though there have been recent rumblings but physicists about "string theory" which it is hoped might be the explanation of everything physical but which is a wholly mathematical enterprise and may remain so.<sup>33</sup> The question is whether or not such speculative theories might give rise to research programmes which could, as Sir Karl Popper liked to insist, tell against them. Popper thought that the falsification of theories was the major issue and that it was a simple idea. It has turned out not to be so simple, but at least one has to allow that something would count against any theory.

Theists have often insisted that nothing would count against the existence of God. The Book of Job seems to be a story to that effect. For believers that is a matter of faith. But the thesis that something might tell against a specific argument for the existence of God is, of course, a different story and has always, I think, always been recognised as such. The notion that the world shows the conditions that would exist if a god of love existed is, I think, quite capable of investigation.

Love requires a plurality of persons for its fullest expression. Self love, to repeat, is possible but always a doubtful commodity. So the world would require a plurality of beings capable of love. Love has to be freely given not something created by an external agency. It requires a world of free agents who will find themselves initially in various degrees of separation, but who will have the capacity to come together – and will show a tendency to do so.

Such a world could not be created all at once. A Hindu god with a taste for cows might think first of creating them, but a cow without an environment — gravity to hold it together, food to eat, the company of other cows, would be impossible. Our world has evolved to contain cows and then to contain human

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<sup>32</sup> Cudworth says that God is love, "if by it be meant, eternal, self-originated, intellectual Love, or essential and substantial goodness, that having an infinite, overflowing fullness and fecundity dispenses itself uninviciously, according to the best wisdom, sweetly governs all, without any force or violence... and reconciles the whole world into harmony." His final judgement is that "love in some rightly qualified sense, is God," *The True Intellectual System of the Universe* (London: Royston, 1678), p. 123 (the page number is misprinted 117 in the three British Library copies); ed. John Harrison, London: Thomas Tegg, 1845, vol. 1, p. 179. (The Harrison edition has a rich index and also J. L. von Mosheim's still-valuable notes.)

<sup>33</sup> See Peter Woit, *Not Even Wrong: The Failure of String Theory and the Continuing Challenge to Unify the Laws of Physics*, London: Cape, 2006, and the discussion by Philip Anderson in *The Times Higher Education Supplement*, August 25, 2006, pp. 22-23.

beings who can express their love and can imagine the divine love of which Cudworth talks.

We can explore this phenomenon. Is it all a kind of sham? Does love merely conceal self-interest? Is it simply driven by biology? Such questions suggest research projects open to us.

What is it that makes people on both sides of the debate so uneasy when such proposals are made? For one thing, any empirical research project with theological implications blurs the distinction which has been endemic in much of our thinking between the natural and the supernatural. Few people, as Anthony Kenny has recently pointed out, now really want to set out to disprove the existence of God. Rather, they think of themselves as devotees of naturalism, the doctrine that there is nothing outside nature, and then they interpret naturalism as physicalism, the thesis that what is described by the natural sciences is what there is, preferably physics.<sup>34</sup> Biology, which, as I said, keeps throwing up traces of issues about values, thus becomes the frontier of a certain kind of unease.

And when the line between the natural and the supernatural is said to be breached, we also become uneasy because such breaches so easily come to seem or to be absurd. An elderly priest once explained to me how the angels won football games for Notre Dame. When I asked what would happen if Notre Dame played Fordham, he assured me that that did not happen. Ruth Kelly, who has lately been the British "communities secretary" and the education minister, landed in controversy for suggesting that a Scottish football player should not cross himself on the pitch on the ground that it aroused enmity between Catholics and Protestants. He was actually given an official "caution" by the Scottish police. Strife on football pitches is a real threat, but Ms. Kelly might have contented herself with raising a wry smile by pointing that it seems unlikely that any god bets or is concerned with the outcomes of football games, and, anyway, we do not know what such an interest would bring about. It is well known to lovers of baseball that the god of perfection is a Chicago Cubs fan on the ground that Wrigley Field is the perfect place for the game and such a god must be present wherever perfection is to be found, but it is also well known that the Cubs usually lose.

Once we admit that values enter into the story, however, we do have to erase the line between the natural and the supernatural. In these terms we can read the New Testament as a story about the coming Kingdom of God, a world in which what ought to happen is what does happen. Thus the New Testament miracles could be taken as precursors of change in which moral laws come to take precedence over the old order laws of the universe.

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<sup>34</sup> Anthony Kenny, *What I Believe* (London: Continuum, 2006).

Sometimes in the New Testament the hungry are fed with loaves and fishes, the thirsty have good wine to drink, the sick get well, and even the unfairly dead, like Lazarus, come to life again – or like Jesus himself turn out to never have been truly dead. Looking for such signs in our world would no longer be taken as moments of dark superstition, but they would have to be related to an understanding of what the good is and given a law-like form. Neither believers nor unbelievers might take kindly to this.

What all this suggests is that there are various ways of reading the world, that the world needs to be interpreted – as does the scripture of whatever religion one subscribes to – in such a way as to make an intelligible story. If, as Gregory of Nyssa urged, what we are confronted with are clusters of qualities which we must arrange in a way which makes sense and can, as he thought, arrange in such a way as to make intelligible the handiwork of the God in whom he believed, then all of this makes sense. The notion that the world is to be read and has more than one reading goes back to Philo whose notions find echoes in the Fourth Gospel.

But that is also the view of contemporary physics. Fuel has been added to the impulses toward the idea of real multiple readings by some recent work of Stephen Hawking and Thomas Hertog. The implications of quantum theory and speculations about the origin of the physical universe lead to the view, indeed, that the history of the universe varies with the way we look at it. There may be infinitely many different histories to choose from, and the one which appeals to us may be determined by the observations we make of it.<sup>35</sup>

The notion that the world is, in some sense, a book to be read, seems to inspire the idea that the world has an author. Sir Arthur Eddington, who was convinced that reality is best understood as the expression of underlying mathematical structures, thought that there was a god who "mathematicises." Such notions are deeply puzzling, perhaps, but the divorce between any intelligible god and any nature we can believe in may not be final, though anyone who tries to bring them together again may well expect to excite the suspicions of both sides. One can avoid that by following Maritain's road. But there is a price to be paid for that, too.

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<sup>35</sup> See the account by Amanda Gefter, *New Scientist*, April 22, 2006, pp. 28-32.



# Matter: From Evil to Subjectivity

Richard Feist

## I. The Malaise of Modality

In everyday discourse we often say things like, “you must hand your paper in on time” or “it is possible that the mission will succeed.” Such utterances heavily rely upon modal terms, for instance, “necessity,” “contingency,” and “possibility,” and we employ modal terms without giving them much thought. This general complacency about such terms is not limited to ordinary discourse; the history of philosophy is full of the uncritical use of modalities. The single most famous critic of modal notions is without doubt W.V.O. Quine. Throughout his long intellectual career, Quine launched several serious attacks against modal terms.<sup>36</sup>

Generally speaking, there have been two types of attacks on the cavalier use of modalities. One stems as far back as Hume (and no doubt further into the complex systems of medieval logic) and is an empirically-based attack on the semantics of modality. Hume insisted that all our terms be, in some sense,

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<sup>36</sup> A classic example of Quine’s analysis of the problems with modal notions is in his “Two Dogmas of Empiricism,” in *From a Logical Point of View: Logical-philosophical Essays* (New York: Harper and Row, 1963). Quine’s writings on modal terms have generated a voluminous reply, which I make no attempt to summarize here. However, a simple overview of modality (including a critique of Quine’s views) can be found in Joseph Melia, *Modality* (Montreal & Kingston: McGill-Queen’s University Press, 2003).

traceable back to experience.<sup>37</sup> Given that experience does not yield necessities, then to the flames with the *enfant terrible* “necessity” and all of its modal siblings that masquerade as ontological terms. Of course Hume’s attack is within the context of a particular interpretation of the semantics of experience itself. What is found within experience is highly dependent on what one takes as constitutive of experience.<sup>38</sup> For instance, Hume’s notion of “experience” would not include such an event as the “intuition of fundamental truths” as one finds in Aristotle’s epistemological investigations.<sup>39</sup>

One might reply that Hume did accept necessity as applicable to the relations between ideas. This account of necessity among ideas is not the same as any kind of ontological necessity; that is, for Hume, necessity ultimately makes sense only within the context of language or as a misnomer for some kind of psychological feeling.<sup>40</sup> The point is that, empirically speaking, modality makes sense only within the context of language.

If one does not like building upon a highly disputable notion like “experience,” one can embrace the second attack on modality, which concentrates on language. Because of this concentration on the proper functioning of language, it is not surprising that this second attack has a relatively recent origin – the early twentieth century.<sup>41</sup> This second, more technically-based attack, insists that all language must be extensional. This raises two questions. First, why should we insist on extensional language? And second, what is extensional language? I will look briefly at the second question.

Admittedly, analytic philosophers use the term “extensional language” quite often and yet rarely define it. “Extensional language” is a very difficult term to nail down – still, the following may help. A piece of language, or a discourse formation, can be classified as extensional when the interchanging

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<sup>37</sup> This is a version of Hume’s insistence that *simple ideas* are derived from *simple impressions*. (*A Treatise of Human Nature*, ed. L. A. Selby-Bigge (Oxford: Clarendon Press, 1990), 2<sup>nd</sup> edition, 4. But the basic idea holds: that experience itself is the basis for ideas.

<sup>38</sup> Not all philosophers agree with the basis of experience upon which Hume constructs his philosophy. For example, Franz Brentano and Alfred North Whitehead are two thinkers that would disagree with Hume’s starting position.

<sup>39</sup> See Aristotle’s discussion in Book I (and especially Book II, chapter 19) of the *Posterior Analytics*. For a good overview of Aristotle’s thinking concerning the foundations of experience, see C.C.W. Taylor, “Aristotle’s Epistemology,” in *Epistemology*, ed. S. Everson (Cambridge: Cambridge University Press, 1990).

<sup>40</sup> See Book I, Part III, Section XIV, “Of the Idea of Necessary Connection” in *A Treatise of Human Nature*.

<sup>41</sup> This is largely, though not solely, through the influence of Quine’s work.

of any two of its co-referential terms does not alter the truth value of the embedding sentence. Consider the following sentence:

(1) The tallest man in Ottawa is taller than anyone else in Ottawa.

Clearly this is a tautology – or as one might say, it has *de dictu* modality.<sup>42</sup> It is a true sentence; however, there is no explicit term that expresses the modality. Nonetheless, this sentence can still be regarded as extensional. To see how, replace the term “The tallest man in Ottawa” with the term “Fred.” For the sake of discussion, suppose that “Fred” refers to the individual who is in fact the tallest man in Ottawa. Thus, “The tallest man in Ottawa” and “Fred” are co-referential terms. If we exchange these terms, (1) becomes:

(2) Fred is taller than anyone else in Ottawa.

This sentence is also true. So the condition of preserving truth conditions under interchanging co-referential terms is satisfied – at least in this case. Let us now generalize and state that if the set of sentences, Q, with truth value, “true,” remains true under the interchanging of “The tallest man in Ottawa” and “Fred” *salva veritate*, then Q is indeed an extensional discourse formation.

Now that we have some idea of what an extensional discourse formation should look like, let us return to the first question as to the importance of extensional discourse. There are numerous arguments for the importance of extensional discourse, but perhaps one of the strongest arguments is one of a logical nature. The point here is that when a language is extensional, we can know which sentences are derivable from which. Ultimately, this is a question of the logical links between sentences. For instance, the propositional calculus clearly illustrates the logical behaviour of the sentential connectives (“not,” “and,” “or” and “if...then”). The predicate calculus, turn, clearly indicates how the internal structure of sentences bears on their inferential relations.

In sum: we have well-understood, tried and true logical systems that reveal entailments relations among sentences. In essence, the ability to understand clearly what follows from what was thought to be of critical importance to doing serious philosophy.

Now, let us consider what happens when we explicitly bring in modal operators. Recall sentence (1) and let us explicitly write it as follows:

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<sup>42</sup> With *de dictu* modality the modality applies to the entire proposition.

(1') It is necessary that the tallest man in Ottawa is taller than anyone else in Ottawa.

Something is different, (1') is not extensional in the sense that (1) is. For if we make the same substitution into (1'), we get (2'):

(2') It is necessary that Fred is taller than anyone else in Ottawa.

This, however, is false—since someone could be taller than Fred. The situation is nicely summed up as follows:

...introducing terms expressing the modal notions into our language converts extensional contexts into non-extensional contexts; and according to many philosophers in the forties and fifties, that means that modal notions can have no place in serious philosophy. [One would think primarily of W.V.O. Quine's protests again modal logic here.]

Why are modal notions not part of serious philosophy? Because sentences containing modal notions cannot be accommodated by the various systems of first order logic. In sum:

...philosophers who invoke these notions have no account of the inferential relations between the various modal claims they want to make. *They have no firm grasp of just what they are committed to in making a particular modal claim; and that, critics insisted, is just to say that they really do not understand what they are saying.*<sup>43</sup>

Now, one might counter, why not just construct a logic for modal inferential relations, just like it was done for sentential and predicate inferential relations? In other words, why not just construct a *modal* logic?

That is precisely what many sympathizers with modal claims did. The problem is that constructing modal logics became a cottage industry: eventually there were too many systems of modal logic. For instance, given two sentences containing modal operators, one internally consistent modal system declare them logically linked while another internally consistent modal system will declare the opposite. Now, which internally consistent modal logic system is correct? This plethora of conflicting, yet internally consistent modal systems played was ample grist for the anti-modalist's mill.

In sum: both the empiricist and the analytic philosopher presented serious concerns about modal terms and, in many ways, caused the retreat of the

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<sup>43</sup> Michael J. Loux, *Metaphysics: A Contemporary Introduction* (New York: Routledge, 2002), 2<sup>nd</sup> edition, p. 180.

modal theorist. Without doubt most philosophers continued to nurse a private belief in the serious use of modals in philosophy but these two attacks left most believers speechless. But, this was about to change.

## II. The New Worlds

Perhaps one of the most fanciful pictures of the universe has to be the “Many Worlds Interpretation of Quantum Mechanics.”<sup>44</sup> This interpretation is certainly the most popular with science fiction artists, and arguably with the general public as well. The basic idea is that the formalism of Quantum Mechanics needs to be interpreted. However, some physicists, such as the late Richard Feynmann, were strongly against interpreting the formalism.

Do not keep saying to yourself, if you can possibly avoid it, ‘But how can it be like that?’ because you will get ‘down the drain,’ into a blind alley from which nobody has yet escaped. Nobody knows how it can be like that.<sup>45</sup>

However, there has been much good work on the interpretation of Quantum Mechanics and so Feynmann’s and Neumann’s views are regarded as somewhat dated. In fact, Quantum Mechanics, shortly after its birth, was given a particular interpretation, which came to be known as the Copenhagen Interpretation.<sup>46</sup> The point is that there are many ways to interpret the formalism of scientific theories and so one must be extremely careful not to naively read a theory’s underlying ontological presupposition straight out of its formalism. The continuing debate over how to interpret the basic equations of special relativity – now over a century since their publication – illustrates the difficulty of interpreting even very so-called simple pieces of scientific formalism.

But let us consider the Many Worlds Interpretation of Quantum Mechanics, which suggests that every time a specific kind of measurement is

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<sup>44</sup> The fundamental idea of the Many Worlds Interpretation was first presented by the physicist H. Everett in ‘*Relative State Formulation of quantum mechanics*’, *Review of Modern Physics* **29**, 1957, pp. 454-462. This idea has been developed in a variety of ways. Perhaps the most famous is that first offered by B.S. DeWitt in his “The Many-Universes Interpretation of Quantum Mechanics”, in *Foundations of Quantum Mechanics* (New York: Academic Press, 1971). The Dewitt line will be the one used in this paper.

<sup>45</sup> Richard Feynman, *The Character of Physical Law* (Cambridge, Massachusetts: M.I.T. Press, 1965), p. 129.

<sup>46</sup> In many ways the term “Copenhagen Interpretation” is a misnomer. The term is a combination of a number of physicist’s views on *how* to read the formalism of Quantum Theory. The most common aspect is of a underlying agnosticism concerning ontology.

made on a particular kind of atomic system, the universe bifurcates. In sum, you get a bubbling of universes. As one commentator on the Many Worlds Interpretation writes:

This universe is constantly splitting into a stupendous number of branches, all resulting from the measurementlike interactions between its myriads of components. Moreover, every quantum transition taking place on every star, in every galaxy, in every corner of the universe is splitting our local world into myriads of copies of itself.<sup>47</sup>

Still, one must keep in mind that the Many Worlds Interpretation is just that: an interpretation of the mathematics of the theory.<sup>48</sup> Moreover, judging by the products of currently working scientists, who rarely indulge in philosophical interpretations, it is not much accepted.<sup>49</sup> Second, judging by the products of currently working philosophers of science, who concentrate on philosophical interpretations, it is the favourite target for criticisms. The standard attacks on this interpretation range from the interpretation's internal consistency and philosophical coherency to the conflict it has with other physical theories. For instance, it presupposes an incredibly unique notion of causality: somehow very simple local actions immediately result in huge cosmic reproductions. That is, to account for a particular problem with measurement we have to accept that the universe somehow makes instantaneous copies of itself at the exact moment we make the measurement. However, it does show that even scientists are, at times, willing to entertain some wild types of ontological hypotheses to solve logical problems.

Now, why this discussion of a particular interpretation of Quantum Mechanics? It is interesting to note that around the same time that the Many Worlds Interpretation emerged, the modal believers held that they could solve the malaise of modality by a similar, multi-world approach. However, they did, as many philosophers tend to do, look back into their own tradition in order to find some sort of solution. What they drew upon was Leibniz's

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<sup>47</sup> R.I.G. Hughes, *The Structure and Interpretation of Quantum Mechanics* (Cambridge: Harvard University Press, 1989), p. 290.

<sup>48</sup> Admittedly, this is an overstatement, since some would argue that the Many Worlds Interpretation goes beyond a simple interpretation of the mathematics, since it drops any kind of wave-function collapse.

<sup>49</sup> Again, this could be an overstatement, since the proponents of quantum cosmology and quantum computing often embrace notions that resemble the views of the Many Worlds Interpretation. However, one must always keep in mind that even the "Many Worlds Interpretation" is not a single interpretation, but a genus of interpretations. Hence, a physicist who works in quantum computing and agrees with one species of the Many Worlds Interpretation may not agree with them all.

possible worlds. There may not be a causal mechanism for generating such worlds (which is likely God's work); however, these worlds are logically required. To declare a proposition is necessarily true is simply to quantify over worlds. Hence, "P is necessarily true" could be unpacked as "For any possible world, W, P is true in W." This provides an easy understanding of *de dictu* modalities. Indeed, one can go on to answer all types of questions concerning *de re* modalities as well.<sup>50</sup>

However, without going into such details, we have to ask: do all these possible worlds exist? What sense of existence are we using when we speak of something "being" or "existing" in a possible world? David Lewis, one of the founders of possible worlds semantics argues that these worlds do exist. Just like the many worlds interpretation of Quantum Mechanics, there a plethora of worlds is required to solve particular intellectual problems. Lewis writes:

Why believe in a plurality of worlds? Because the hypothesis is serviceable, and that is a reason to think that it is true. The familiar analysis of necessity as truth in all possible worlds was only the beginning. In the last two decades philosophers have offered a great many more analyses that make reference to possible worlds, or to possible individuals that inhabit possible worlds. I find that record most impressive. I think it is clear that talk of *possibilia* has clarified questions in many parts of the philosophy of logic, of mind, of language, and of science – not to mention metaphysics itself. Even those who officially scoff often cannot resist the temptation to help themselves to this useful way of speaking.<sup>51</sup>

There is no question that Lewis is right that talk of possible worlds has proven highly useful.<sup>52</sup> But, of course, "usefulness" is not truth in the traditional sense of that term. Instead, it is a pragmatic use of the term "truth." Many philosophers seem to hold a more traditional notion of truth when they encounter Lewis' views on possible worlds. Lewis himself confesses that many times, when presenting his position, philosophers in the audience replied with "blank stares."<sup>53</sup>

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<sup>50</sup> *De re* modalities apply within the proposition itself, i.e., to its parts.

<sup>51</sup> David Lewis, *On the Plurality of Worlds* (Oxford: Blackwell Press, 1986), p. 3.

<sup>52</sup> For an examination of the Many Worlds Interpretation of Quantum Mechanics and Lewis' ontology, see B. Skyrms, 'Possible Worlds, Physics and Metaphysics', *Philosophical Studies* **30**, 1976, pp. 323-332.

<sup>53</sup> David Lewis, *On the Plurality of Worlds*, p. 112.

There are many challenges to Lewis' system, Alvin Platinga, for instance, has responded with a well-developed system of his own.<sup>54</sup> But, the question that we should go back to is, how did we end up with all this wild talk of possible worlds? How did we get here?

### **III. Ontological Pruning?**

Michel Foucault once remarked that he worried that at the end of the day, despite all his attempts to construct history in a new and non-Hegelian fashion, Hegel himself might be standing at the end of such a task, motionless and waiting.<sup>55</sup> In a similar way, Hume stands behind it all – driving the show as it were by remote control.

We have seen that Humean types of empirical epistemologies were responsible for one of the attacks on modality. Although Hume had numerous motivations, one was the desire to eradicate metaphysical essences. They simply could not be brought before the tribunal of the senses and so were ultimately unacceptable. In other words, there was a strong nominalistic drive to Hume's program. This nominalism has appeared quite strongly in possible worlds theories, especially that of David Lewis. Recall that a modal notion like necessity, is reduced to a set of possible worlds. These worlds consist solely of individuals; there are no "properties" per se and certainly no second order properties.<sup>56</sup>

As many philosophers have pointed out, this seems to violate some basic intuitions that we have about properties and propositions. In other words, bringing in all these notions of possible worlds may, in some sense, solve problems, such as "what does necessity mean?" but does possible worlds theory solve problems in an acceptable manner? After all, the problem of the relationship of the mind and body is easily "solved" say the eliminative materialists like Paul Churchland – there is no such thing as mind! – but that is not an acceptable solution for everyone. Properties and propositions are things that we "know" and "believe." They are things towards which we have attitudes. The question is, is the analysis of a property in terms of a set of possible worlds truly addressing the problem of the meaning of modality or is such an analysis simply bypassing the problem of the meaning of modality in favour of another issue? It appears that some aspect of subject change is occurring here.

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<sup>54</sup> Alvin Platinga, "Actualism and Possible Worlds," in *Metaphysics: Contemporary Readings*, ed. M. J. Loux (London and New York: Routledge, 2001), pp. 168-188.

<sup>55</sup> Michel Foucault, *The Archeology of Knowledge*, tr. A. M. Sheridan Smith (New York: Pantheon Books, 1972), p. 235.

<sup>56</sup> Nonetheless, not all modal theories are nominalistic; Platinga's view, for instance, is not.



So, this is the turning point, to *completely* get rid of essences is to embrace nominalism. However, this would then start down the path to possible worlds and end up with very counter-intuitive explanations of such regularly used expressions as “necessity” and “contingency.” Perhaps we could say that underneath this turning point was a particular philosophy of nature – one with essences and one without.

But, many would argue, physical science jettisoned all talk of essences long ago. And, to employ a reasoning of which Quine would approve, science is simply the best game in town and all our ontological issues must be decided via the approach of science: the system’s edge squares with experience and its internal nature strives for simplicity of law.<sup>57</sup> So, let’s follow science and reject all talk of essences. Whatever happens philosophically after that, we just have to deal with it. There is no turning back. Or is there?

#### **IV. Essences in Science**

It is certainly the case that scientific investigations of the world began by using the notion of “essence.” Aristotle adopted the Socratic search for definitions as a basis for all investigations and such a search had as its goal the linguistic articulation of an essence. This methodology was, more or less, used throughout science for centuries until more empirically-based criticisms eroded confidence in essences.<sup>58</sup>

However, the history of science is extremely complicated; it is not a single march towards the truth; the history of science is not a continuum of theories that are converging on truth. As Larry Laudan points out in a classic paper, the notion of a convergence on truth is useful because it is so vague.<sup>59</sup> One should keep in mind that many theories are proposed, tested and rejected and yet live to return another day in another form. Aristotle, for instance, discusses and rejects a particular version of evolution since it simply does not fit the facts – at least those facts of which he was aware.<sup>60</sup> Indeed, one can point out, as Laudan does, that many theories come and go only to return again. Plate tectonics is another example.

In the history of the philosophy of science, the twentieth century led the charge against essences, indeed, any kind of metaphysics in science. Now, just because metaphysics is banned from science, that is not tantamount to a

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<sup>57</sup> Quine, “Two Dogmas of Empiricism,” pp. 44-45.

<sup>58</sup> This is a huge and sweeping generalization, but does, I maintain, capture the flow of the movement away from essences.

<sup>59</sup> Larry Laudan, “A Confutation of Convergent Realism,” in *The Philosophy of Science*, eds. R. Boyd, P. Gasper and J. D. Trout (Cambridge: The MIT Press).

<sup>60</sup> Aristotle, *Metaphysics*, Book II, Chapter 8.

ban on metaphysics *per se*. For instance, Pierre Duhem and Hans Reichenbach both agree that science does not – indeed, absolutely should not – attempt to include essences; science should stick to discussing observables.<sup>61</sup> This examination of the observables is the key to good science.

Where Duhem and Reichenbach part company is over metaphysics itself. Duhem still holds that not only is metaphysics possible, it is in fact a superior science to physics. Duhem explains:

Now these two questions – Does there exist a material reality distinct from sensible appearances? and What is the nature of this reality? – do not have their source in experimental method, which is acquainted only with the sensible appearances and can discover nothing beyond them. The resolution of these questions transcends the methods used by physics; it is the object of metaphysics.

Therefore, *if the aim of physical theories is to explain experimental laws, theoretical physics is not an autonomous science; it is subordinate to metaphysics.*<sup>62</sup>

Reichenbach agrees that there is a sense of meaning outside that of science, by which Reichenbach breaks with standard positivist thought. However, Reichenbach insists that the path towards any epistemology must first pass through natural science.<sup>63</sup> Reichenbach insists that there is a sense in which metaphysical considerations do influence one's scientific judgments – the topological structure of space in itself for instance, is influenced by the metaphysical judgment one makes concerning causality. If one assumes “normal causality,” by which Reichenbach means the standard causality accepted by working scientists, one then has the topological structure associated with relativity theory. If one assumes “non-standard causality,” by which Reichenbach means the “pre-established harmony” propounded by Leibniz, then one can preserve the Euclidean topology associated with everyday experience.<sup>64</sup> According to Reichenbach, any conflict between science and metaphysics should be decided in favour of science.

But there is another, perhaps more telling, connection between Duhem and Reichenbach. When each uses the term “science,” each is really speaking about “physics.” Neither thinker could be called a philosopher of biology or

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<sup>61</sup> For Duhem, see *The Aim and Structure of Physical Theory*, tr. Philip P. Wiener (New York: Atheneum, 1977). For Reichenbach, see *The Philosophy of Space and Time*, tr. M. Reichenbach and John Freund (New York: Dover Publications, 1958).

<sup>62</sup> Duhem, *The Aim and Structure of Physical Theory*, p. 10. (Duhem's italics.)

<sup>63</sup> Reichenbach, *The Philosophy of Space and Time*, p. 110.

<sup>64</sup> Reichenbach, *The Philosophy of Space and Time*, Section 12, “Spaces with Non-Euclidean Topological Properties.”

chemistry. More generally, when philosophers of science do write about science, they are writing about the philosophy of physics. More precisely, they are examining the philosophical foundations of the historical appearances of theories in physics.<sup>65</sup>

If one studies the history of physics, one certainly finds that physicists have been leery about essences. Descartes, for instance, regarded the essence of matter to simply be extension. Boyle, Locke and Newton regarded the true qualities of bodies, the inherent qualities, to simply be what is commonly called primary qualities. Differences between bodies must ultimately be traced to differences in primary qualities. But these primary qualities, in sum, are passive. The only place for activity is in consciousness – that of our minds and of God. Nature itself, as it was often said, was dead.

Were one to carefully study the history of chemistry one would get a different picture. Brian Ellis makes exactly this point in his recent and interesting book, *The Philosophy of Nature: A Guide to the New Essentialism*.<sup>66</sup> Ellis notes that he was in fact a Duhemian in many ways. After all, a point mass is not in any way achieved via some kind of stripping argument. Peeling away the inessential properties will not, ultimately, give us the essential properties of anything. Indeed, as is often pointed out, imagination plays a huge role in such accounts as Newtonian thought. This imagination is often rife with metaphysical ideas, which is grist to Duhem's mill. Despite the latent acceptance of metaphysical elements in physics, Ellis turns towards another branch of science. Ellis remarks:

The essentialist theory that I now accept derives mainly from taking scientific theories about the underlying causes of things much more seriously, and refocusing on areas of science where such theories abound – particularly chemistry.<sup>67</sup>

Chemistry, that is, the modern chemical theoretical picture, is loaded with all kinds of causal claims concerning chemical reactions – claims that Duhem would have regarded as metaphysical. The modern chemical theoretical picture, more accurately described as a family of chemical-based theories, are:

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<sup>65</sup> This has changed greatly since there are simply so many more areas of science now being philosophically examined. This is even reaching the teaching of the philosophy of science. A relatively recent undergraduate text book on the philosophy of science approaches the discipline from the perspective of immunology. (Paul Klee, *Introduction to the Philosophy of Science: Cutting Nature at the Seams* (Oxford: Oxford University Press, 1997).

<sup>66</sup> Brian Ellis, *The Philosophy of Nature: A Guide to the New Essentialism* (Kingston and Montreal: McGill-Queen's University Press, 2002).

<sup>67</sup> Ellis, *Ibid.*, p. 24.

not abstract model theories, like, for example, those that are commonly found in space-time physics. In relativity theory and Newtonian mechanics, the Duhemian account seems to be not too far from the truth, for the aim of physics in these areas is, very plausibly, just to provide a framework for representing objects in space and time, systematic ways of deriving the laws of motion for such objects, and ways of making predictions based on these laws. However, the chemical theories are not even plausibly describable as abstract model theories, as the dynamics of Newton and Einstein were, because nearly everyone who accepts them believes that the theoretical entities of these theories – the atoms and molecules – all exist, really have the properties ascribed to them, and actually take part in interactive processes like those described.<sup>68</sup>

### V. Matter as Evil and Matter as Subjectivity

Today it certainly seems odd to call matter “evil” or attribute subjectivity to it. Typically these are attributes that we limit to humans. Of course, the modern environmental movement, in the incarnation referred to as “deep ecology” often speaks of the world of non-human animals as “objects of moral standing” or “bearers of intrinsic value.” So, we have what we could call a modern discourse formation that does indeed speak somewhat in terms of evil and subjectivity outside the human domain.

Matter has long been a problem for philosophers. One can think of Aristotle’s struggles with it. Aristotle’s thoughts here are quite simple in one sense, yet perplexing in another. Suppose one has a lump of copper. One can shape it into a bowl, a cup, then perhaps a statue. So, the lump of copper has taken on three successive forms. But, consider the copper itself. That, too, has a form that makes that particular lump of matter a lump of copper and not something else. So, what is the ultimate matter that takes on the copper form and then the other forms? This ultimate, or prime matter, Aristotle defines as “...that which in itself is neither a something nor a quantity nor any of those other things by which being is determined.”<sup>69</sup> Negatively speaking, this is not difficult to understand: matter simply is not characterized in any way. I suppose that this, too, is a problem, since Aristotle insists that all characterizations of matter are only accidental characterizations of it. So, even to say that “matter is not characterized in any way” is, in fact, to assert a property of it – which is precisely what one cannot do. Positively speaking, matter is not something to which we can associate any kind of image or representation. This, however, is not a problem *per se*, since there are many

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<sup>68</sup> *Ibid.*, p. 25.

<sup>69</sup> Aristotle, *Metaphysics*, 7.3.1029a20.

knowable things for which no corresponding image exists, such as the chiliagon that Descartes discusses in his *Meditations*.

However, a triangle would be made of what Aristotle would call “intelligible matter,” matter that could be known but imperceptible to the senses. The lump of copper mentioned above would be sensible matter. But again, what about *completely* essence-less matter, this prime matter? Does it exist? This much is for sure: Aristotle epistemologically declares that “...matter is unknowable in itself.”<sup>70</sup> The medieval tradition certainly interpreted him as ontologically declaring that prime matter does not exist. However, there is an ongoing debate as to whether Aristotle himself ruled out the existence of prime matter. My point here is that matter was an extremely important concept in Aristotle’s philosophy but he was unsure as to what to do with it. It remains, in a sense, the ultimate other – something sitting just outside the limits of any possible human experience.

This view that matter was outside the limits of human experience also turns up in the thought of Plotinus. Plotinus’ relationship to Aristotle and Plato is a matter of much debate – beyond the scope of my paper here. But, suffice it to say that matter also serves as a kind of limiting concept and it is not entirely clear as to whether or not matter actually exists in Plotinus metaphysics. He certainly says that matter is “non-being” so that matter cannot exist in the way, say, a hat or a desk does, but that is not to say that matter is devoid of all existence in any sense of that term. But, I wish to pass over the exact nature of the existence of matter in Plotinus. What is interesting here is that matter has begun to take back some characteristics in Plotinus – he refers to matter as evil and as the source of evil in the soul. This, of course, leads immediately to the problem of the origin of matter. The One is, via emanation, the source of everything. The One would then have to be the source of matter and so, the ultimate source of evil. This, too, I shall pass over.

What I find interesting is that matter not only has a characteristic, but is also a causal agent. For, again, evil presents a problem for Plotinus’ metaphysics of soul. What is interesting is that the seeds of subjectivism in matter can be found in Plotinus’s notion of how the soul becomes evil via its interaction with matter. Plotinus writes:

Matter is therefore both cause of weakness in the soul and cause of sin. It is therefore itself antecedently evil and primary evil. For even if the soul, by being subject to some affection, herself generated matter, and if the soul then

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<sup>70</sup> *Ibid.*, 7.9.1036a8.

shared in matter and became evil, matter is still the cause of evil by its presence.<sup>71</sup>

So, matter is not inert since it is, in a particular sense, the cause of evil. Plotinus thinks that it is a necessary cause of evil, but not a sufficient cause.

Now, this notion of matter as having any kind of essence, as we have seen, was eclipsed shortly after the middle ages in the scientific revolution. We also saw that the rise of physics as the dominant scientific discipline led to burying the notion of matter having any kind of essence. But, as we have just seen with Aristotle and Plotinus, it is difficult to strip matter of all its determinations.

## **VI. Weyl and the “Agens Theory” of Matter**

In traditional or classical physics, matter became the object of geometrical treatment. In this matter remains as something quite other than anything else, except perhaps with the structure of space-time. Both matter and space-time were seen as something simply “there,” simply inert. Even relativity theory tended to treat matter as inert, in a certain sense. But things began to change, at least in the mind of Hermann Weyl, around 1920.

Without going into Weyl’s biographical details, suffice it to say that next to Albert Einstein, Weyl was the greatest contributor to the theory of relativity. Even some ideas that Weyl had concerning the development of the theory, ideas which Einstein rejected, were eventually regarded as entirely worthy of serious scientific investigation.

An important event occurred around 1920, the development of quantum mechanics – whereby the underlying picture of matter begins to change. Matter no longer was a simple object amenable to deterministic and geometric treatment. That is, matter was no longer seen as strictly governed by classical, deterministic laws. Statistical analysis was required to accurately treat matter. Instead of particular results concerning the behaviour of matter, scientists began to accept that one must speak in terms of “statistically significant trends.”

The next concept that came into play is that of the “developing continuum.” In other words, Weyl held that physics was indeed pointing towards a philosophy of nature that highly resembles what we today would deem “process metaphysics.” Regions of space-time must not be thought of as “entirely present, completed once and for all.” Instead, they are developing constantly and will only reach their final development at the end of all time. This notion of a developing space-time is notoriously difficult to square with

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<sup>71</sup> Plotinus, *Enneads*, I.8.14.49-54.

standard accounts of efficient causality since they have, so to speak, teleological overtones. Weyl writes:

Indeed, the future will act on and on upon the present and it will determine the present more and more precisely; the past is not finished. Thus the fixed pressure of natural causality disappears and there remains, irrespective of the validity of the natural laws, a space for autonomous and causally absolutely independent decisions; I consider the elementary quanta of matter to be the place of these decisions.<sup>72</sup>

For Weyl, the gravitational fields described by the field-equations of general relativity, then, are results of the inner activity – the subjectivity of matter. This really is the result of the problem of an extended object in field physics. Usually in describing objects in physics, the physicists were concerning solely with the object’s behaviour; the inside was ignored. But after the rise of the field theories, the problem of the “insides” of objects became increasingly acute. Weyl spoke about this in his 1921 paper, “Feld und Materie (Field and Matter).”

Technical details aside, the problem is quite simply stated: within the context of field-equations, one is limited to speaking solely about the behaviour of certain properties and a very limited notion – if at all – of their internal properties. In sum, the “insides” of objects just dropped out of the picture altogether. Weyl came to view the field simply as an inert transmitter of effects. Matter, he held, is “behind the field” and determines the effects transmitted by the field. Matter, as Weyl writes, is an *agens* (from the Latin term, “agree,” “to act” or “to move”).<sup>73</sup>

There are many more places in Weyl’s writings where he explicitly compares the human ego and that of the inner “ego of nature.” Nature, in this sense, has become very much alive. The point is that even physics, for a while, lead in the direction of a particular philosophy of nature and held matter as something that was not inert.

## VII. Summary and Conclusions

Briefly put, the drive to eradicate essences from the world, to construct a philosophy of nature that does without them, played a key role in what I called the malaise of modality and pushed much thinking in the direction of

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<sup>72</sup> Hermann Weyl, (1920). *Das Verhältniss der kausalen zur statistischen Betrachtungsweise in der Physik*. Schweizerische Medizinische Wochenschrift, 50:737-741.[GA 38: II, 113-122] This quotation is GA, p.121—my translation.

<sup>73</sup> Weyl, 1921a, p.254. “Ein die Feldzustände verursachenden *Agens*.” Not surprisingly, the term “*agens*” is borrowed from Leibniz, a considerable philosophical influence on scientists of this time.

embracing possible worlds semantics as a solution to the malaise. I also stressed that the history of physics substantially embraces this drive to eradicate essences. But, the history of physics, as I suggested, is a very complex object and should not be simplified by equating it with the anti-metaphysical interpretations of it. The same goes for the history of science; it too, is a complex object and it should not be equated with a subset of the history of physics. This, of course, makes the important history of chemistry and biology irrelevant.

Matter, as I have stressed, is simply something that continues to haunt thought. In a sense, it resists the attempts to strip it. When it is stripped in a system, eventually properties accrue to it in other systems. As we have seen matter went from an indeterminate nothing to something evil and something possessing subjectivity.

Now we might conclude from this that science, in some way, simply cannot work without essences. That the history of science just keeps pushing us back in that direction. That indeed, might be the case. However, the future history of science may say something quite different. And here I suggest that this might indeed be on the horizon. Of course this is only a suggestion – perhaps a “wait and see” kind of comment. If one examines Quantum Mechanics, which is pretty much the most developed and promising part of modern physics, and if one also holds to unity of science theme – which is not without controversy, then one might say something like the following.

Without going into technical details, it seems that properties are possessed in an odd way in Quantum Mechanics. Typically we ask that an object *O* bears property *P*. *O* is a distinct object and so on. Some properties are relational – father of, for instance. But, we clearly hold that some monadic. Quantum Mechanics points to a more relational, holistic view of properties. No properties are monadic. In this sense, nothing has an essence – or if it did, it would be the entire universe.

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# **The Recent Travails of Hylomorphism**

François F. Savard

## **Introduction**

I would like to open with a personal note. I come to philosophy from a background in the environmental sciences. As a result, my exploration of Thomism and Aristotelism is coloured by serious concern over technology. And so, the following excursions into societal, technological and historical matters will push the envelope of philosophical reflection.

This paper could have been limited to painting the picture of the travails of hylomorphism in the scholarly community, going from the mid-XIXth century to the present time. Such was my original intention. We will do some of this, but we will also explore a related theme: the relative absence of hylomorphism in our scientific and technological development, and the consequences of this absence.

## **1. Hylomorphism in the XIXth Century and Early XXth Century**

Matter and form, act and potency. We are back to the fundamental principles of substance in the Aristotelian universe: substantial form is to prime matter as act is to potency. Forms are not infused from above, but rather educed from the potency of prime matter. This occurs through the action of a sufficient agent possessing the perfection of the new form, acting in substances properly disposed for the new form. And the parts of a substance are not substances, but they exist in a kind of potency termed virtual presence, or presence by powers.

What of this ancient doctrine at the end of the XIXth century and into the XXth – the triumphal age of atomic chemistry and physics? Certainly, the hylomorphic doctrine had consistently faced opposition from many quarters. The Aristotelian and Thomistic notion of substance had been

challenged by modern science ever since Bacon, Descartes and Newton. The trend continued in 1876 with Félix Frédault's *Forme et matière*, which furnished a lively condemnation of Aristotelian hylomorphism.<sup>74</sup> Frédault was confident in the newly-acquired knowledge of his time regarding the atomic nature of matter. He argued against the traditional doctrines of hylomorphism and substantial unity, and in favour of the substantial existence of matter in its own right. The travails of hylomorphism continued apace.

In 1879, Pope Leo XIIIth issued the encyclical *Aeterni Patris*, enjoining Catholic scholars to embrace St. Thomas in no uncertain terms. The Pope's concern included the physical sciences (we will return to Pope Leo's encyclical below.) In 1892, he penned a particularly warm letter of introduction for the Sulpician father Albert Farges' *Matière et forme en présence des sciences modernes*. This work reached a fifth edition in 1900 as part of an eight-part course of philosophy whose stated aim was to "vulgariser les théories d'Aristote et de saint Thomas et leur accord avec les sciences."<sup>75</sup>

The end of the XIXth century also saw the foundation of the *Revue Thomiste* and a number of other Catholic scholarly journals. Their express purpose was to give voice to reflections on scientific scholarship in the light of Aquinas. A wealth of such activity was indeed documented in the *Revue Thomiste*, in the journals spawned at Louvain, and in the American journals that would emerge in the following decades.

In our exploration of the travails of hylomorphism, Louvain's Institut de Philosophie deserves a tome to itself. In this house of study created by order of Leo XIII, Cardinal Mercier, Chanoine Nys, and many others (including the young Charles De Koninck) studied the physical and biological sciences in the explicit light of Thomistic metaphysics and philosophy of nature.<sup>76</sup> No matter that Louvain was destroyed in both World Wars – she twice rose from the ashes to pursue her vocation.

The return to Thomas was re-affirmed by Pius X in 1914 and then by Benedict XV in 1916, who promulgated the "24 theses." In 1917, Canon Law incorporated the following text: "The study of philosophy and theology and the teaching of these sciences to their students must be accurately carried out by Professors (in seminaries, etc.) according to the arguments, doctrine, and principles of S. Thomas which they are inviolately to hold."<sup>77</sup>

<sup>74</sup> Félix Frédault, *Forme et matière* (Paris: Émile Vaton, 1876).

<sup>75</sup> Albert Farges, *Matière et forme en présence des sciences modernes* (Paris: Berche et Tralins, 1900), 5<sup>th</sup> edition. The quote is taken from the subtitle.

<sup>76</sup> Father Lawrence Dewan holds that much of what we might call philosophy of nature in fact belongs to metaphysics – including the hylomorphic doctrine.

<sup>77</sup> Codex of Canon Law, 1917, Canon 1366, s.2, as per p. xviii, Vol.1, *Summa Theologica* of St. Thomas Aquinas (Notre Dame: Christian Classics/Ave Maria Press, 1981). Reprint of the Benzinger Brothers edition of 1948.

## 2. Jacques Maritain's Contribution

L'entre-deux-guerres – the 1920's and 1930's – is where we rejoin Jacques Maritain. In his wide-ranging contribution to philosophy, he did not neglect the relations of philosophy and experimental science, including the topic of hylomorphism. These questions took up the first part of his magnum opus, *Distinguer pour unir, ou les degrés du savoir* (original French text in 1932; an English translation acceptable to Maritain appeared in 1959, published by Scribner's, New York). The same issues were also developed in his *Philosophie de la nature – Essai critique sur ses frontières et son objet* (Paris, Téqui: second edition in 1935).

Maritain desired to maintain a vital distinction between philosophy and experimental science. He developed a firm position on their distinct levels of intelligibility. Philosophy was a dianoetic science – a knowledge of essences, while experimental science was a perinoetic science – a science not of essences, but of phenomena. Maritain held that since hylomorphism was a dianoetic kind of knowledge, what kind of reception could it expect from the scientific community? How could it be made accessible to a scientific train of thought?

In this firm position, might he not have been excessively critical of fellow scholars' attempts at making hylomorphism more accessible to a wider, less philosophical audience? In other words, did he not set the bar too high regarding reflection on hylomorphism?

One particular case might serve to illustrate this situation. In 1924, Father Pedro Descoqs' *Essai Critique sur l'hylémorphisme* was published by Gabriel Beauchesne in Paris. This was a comprehensive attempt at affirming the ongoing validity of hylomorphism in the light of modern science. Descoqs was engaged in an ongoing polemic with Augustin Périer, among others, in *La Revue de philosophie*. Périer's own *Matière et forme: quelques objections contre l'aristotélisme ancien et moderne* had just been published in 1923 by Geuthner. In his preface, Périer took particular issue with Farges' earlier condemnation of those whose "contempt or laughter dispensed them of intelligence" on the matter of Aristotelian hylomorphism (my translation from the Avant-Propos). All three of these works had received the Imprimatur.

In his work, Father Descoqs took great pains to point out that philosophical principles cannot depend on scientific proof. And yet Maritain dismissed the attempt on the grounds that Descoqs did not sufficiently abstract philosophical meaning from the scientific facts. "C'est une illusion de croire qu'en faisant appel à des faits scientifiques sans les assumer dans une lumière philosophique on pourra dirimer un débat philosophique. C'est là, me semble-t-il, l'erreur du Père Descoqs dans son livre sur l'hylémorphisme. Il a recueilli avec une érudition très méritoire un grand nombre de faits scientifiques, mais de ces faits tels quels il a

voulu tirer des conclusions philosophiques. Les faits scientifiques bruts ne disent rien sur la question de la matière et de la forme...il n'est pas étonnant que l'enquête du P. Descoqs débouche sur des résultants décevants" (*Philosophie de la nature*, pp. 136-137.) Thus, an entire work – the fruit of decades of study and teaching – was summarily executed.

One might be tempted to ask: is this a reasonable approach to a fellow Thomist in a world increasingly hostile to Thomistic principles? Was this typical of Maritain's approach?<sup>78</sup> In his defence, Maritain was committed to the highest standard of quality. He had no idea of what the coming decades would hold in terms of the loss of institutions and resources dedicated to Thomism.

Maritain did not appear to take a significant interest in subsequent developments on hylomorphism. His discouragement regarding the future of hylomorphism seems to be shared by Etienne Gilson in a letter to Maritain, in 1971.<sup>79</sup>

### 3. Other Developments in the XXth Century

A variety of other views on science and philosophy developed among Thomists in the XXth century. Charles De Koninck and the scholars at the Université Laval (Simard, Kocourec) did not see the break between science and philosophy in the same light as Maritain. Father William Humbert Kane and his team – including Benedict Ashley, Nogar, and others – formed an academy in 1950 at the Albertus Magnus Lyceum near Chicago. Known as the River Forest School, this fruitful association would last until the 1960's. This school was based on a very positive approach towards the relations of philosophy and the experimental sciences. High school and university curricula were developed that integrated an Aristotelian philosophy of nature with contemporary science. Vincent E. Smith also showed significant leadership in the 1950's and 1960's. His tomes on philosophy and physics, and the series of studies he edited at St. John's University in New York expounded the compatibility of Thomism and modern science, including the case of hylomorphism.

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<sup>78</sup> In the 1930's, Peter Hoenen produced a series of studies on the philosophy of inorganic matter. Some of Hoenen's work is critically commented in Maritain's *The Degrees of Knowledge* (pp. 42-43).

<sup>79</sup> "What separates us most irreparably from (modern science) (insertion by L. Dewan) is the Aristotelian (and common sense) notion of Substantial Form ... Descartes rid nature of it. They understand nothing anymore since they forgot Aristotle's great saying that "there is no part of an animal that is purely material or purely immaterial". It is not the word "philosophy," it is the word "nature" which separates us from our contemporaries. Since I do not have any hope of convincing them of the truth (which yet is evident) of hylomorphism, I do not believe it is possible to propose our hypothesis to them as scientifically valid." (as quoted by Fr. Lawrence Dewan in his paper, "The Importance of Substance," first presented at the Maritain Summer Institute, University of Notre Dame, in 1998).

A similar positive approach is shared by Father William Wallace: “No inconsistency need be involved...in invoking both an essential composition and a structural composition in explaining the properties of bodies.”<sup>80</sup> Father Wallace’s summative work, *The Modelling of Nature* (1996, Catholic University Press) presents a unified vision of the philosophy of nature, the philosophy of science and scientific facts.

In the French tradition, F.-J. Thonnard provided a comprehensive overview of Thomistic philosophy and science up to 1950.<sup>81</sup> Jean Daujat demonstrated the compatibility of Thomism and modern nuclear physics.<sup>82</sup> P.B. Grenet provided an integration of biological evolution and Thomism.<sup>83</sup> And Georges Salet provided an answer to Jacques Monod’s influential *Le hasard et la nécessité*.<sup>84</sup>

The sixties, seventies and eighties saw a precipitous decline of interest in hylomorphism. In this context, the American Catholic Philosophical Association, the Aristotelian Society, the Society for Thomistic Natural Philosophy, and the various Maritain Associations worldwide, as well as similar organisations in Europe and in the Latin countries have all served as vital recipients for the ancient wisdom. The history of their work should one day be written.

Recently, Thomism has borne more hylomorphic fruit with Joseph Bobik’s *Aquinas on Matter, Form and the Elements: A Translation and Interpretation of the De Principiis Naturae and the De Mixtione Elementorum of St. Thomas Aquinas* (University of Notre Dame Press, 1998). *The Thomist*, *The Modern Schoolman*, and other specialized journals continue to publish hylomorphic-friendly articles. For example, see Christopher Decaen’s recent article in the *Thomist*, vol. 64 (2000), “Elemental Virtual Presence in St. Thomas,” with a comprehensive English-speaking bibliography on the subjects of hylomorphism and presence by powers since the 1930’s.<sup>85</sup>

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<sup>80</sup> William Wallace, “Hylomorphism,” *New Catholic Encyclopedia*, 1967, Vol. 7, p. 284.

<sup>81</sup> F.-J. Thonnard, *Précis de philosophie en accord avec la science moderne* (Paris: Desclée, 1950).

<sup>82</sup> Jean Daujat, *Physique moderne et philosophie traditionnelle* (Paris: Desclée, 1958).

<sup>83</sup> P.B. Grenet, *Les 24 thèses thomistes (de l’évolution à l’existence)* (Paris: Téqui, 1962).

<sup>84</sup> Georges Salet, *Hasard et Certitude* (Paris: Éditions Scientifiques Saint-Edme, 1972).

<sup>85</sup> These later works, along with those listed in previous footnotes, are also part of the extensive bibliography compiled by Michael Storck for his doctoral dissertation “St. Thomas Aquinas on the Presence of the Elements in Living Substances,” completed in 2004 at the Catholic University of America.

#### 4. The Damaging Role of Conflict?

Disagreement among Aristotelians and Thomists may have worked against the dissemination and maintenance of hylomorphism among the scientific community of the middle and late XXth century.

For example, in 1984, Patrick Chalmel published an abridged version of his doctoral dissertation completed at the Pontifical University of St. Thomas Aquinas, under the title of *Biologie Actuelle et Philosophie Thomiste* (Charles Téqui, Paris). His work included a preface by the eminent French biologist Pierre-Paul Grassé. Chalmel affirmed the compatibility of modern biology – with its basic postulates of the material origin of life, evolution, and the cybernetic nature of living organisms – with Thomistic philosophical principles.

Chalmel's work was criticized in the *Revue Thomiste* of 1986.<sup>86</sup> The reviewer held that Chalmel had misunderstood the notion of "virtus" and that he had erroneously reduced substantial form to the structure of living beings. This criticism may have been excessively harsh. Chalmel had in fact mapped out and furnished a valuable, in-depth discussion on the compatibility of modern biology and Thomistic philosophy.

A more positive review might have promoted the dissemination of Thomistic views in the critical ongoing debate on bioethics. The 1980's and 1990's saw the introduction of groundbreaking technologies in assisted human reproduction, in opposition to traditional notions of human nature and human dignity. If they had been recognized by the Thomist community, Chalmel's valid developments might have been fruitfully drawn out in the defence of traditional Church positions.

The above questions and comments may reflect a fundamental misunderstanding of Maritain and of his legacy. In any case, the fact remains that over the past century, the advocates of substantial hylomorphic unity have faced opposition from within their own scholarly community. This could only add to the increasing distance between hylomorphists and most scholars active in the physical and biological sciences.

Let us now consider a more general question: could the relative absence of hylomorphism in western scholarship have led to more than philosophical consequences?

#### 5. Unnatural Technology: Wherefrom?

The XXth century has spawned a wide variety of unnatural technologies. These appear to be the result of our growing ability to reduce substantial wholes into parts, and then to reconstruct them into artificial wholes. We can break natural materials down to the molecular and atomic level, and

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<sup>86</sup> Bernard Hubert, "Patrick Chalmel, *Biologie actuelle et philosophie thomiste*, *Essai de Philosophie*," book review in *Revue thomiste*, Tome LXXXVI, janvier-mars 1986, p. 167.

reconfigure them into a wide variety of synthetic materials. We have also acquired the ability to generate and transmit a wide variety of artificial electromagnetic signals.

Much of this technology has turned out to be hostile to the substantial bodily unity of human beings and all living things. We have surrounded ourselves with toxic chemicals and hazardous radiation, all of this leading to ecosystem instability and widespread illness.<sup>87</sup>

Who is not aghast at the momentum enjoyed by toxic technologies, and at society's eagerness to adopt new technology while remaining ignorant of its dangers? In this respect, scientists, educators and legislators have much to reproach themselves. A simplistic condemnation of moral weakness in at the prospect of financial gain does not serve as an explanation. The roots of our technological development must be examined – including its formative philosophical environment.

My question is, “what of the philosophers?” We have just seen that during the 1920's and 1930's, while organic chemistry, nuclear physics and radio technology were in a red-hot period of development, leading Thomists were arguing over finer points of epistemology. What were the consequences of this mutual isolation?

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<sup>87</sup> Among these widely-accepted yet destructive technologies, let us mention only three for the sake of brevity: first, mainline cancer therapies, which consist of carcinogenic radiation and chemotherapy; second, our modern food processing technologies, which have successfully removed the very expectation of substantial unity from the dinner table; third – and this is an example which will surprise many – our electrical and telecommunications technologies. An entire chapter of history might be written on the West's ill-advised embrace of electrical technology, beginning at the end of the XIXth century.

The Eastern Bloc and Europe developed a different approach to this area of research and medicine. Their electromagnetic exposure standards are designed to prevent whole-body symptoms. They reflect a robust conception of the substantial unity of living beings, as opposed to North American standards, which are based on a reductionistic approach that focuses on a single physical effect: heat. Russia, China, Poland, Italy, Belgium, Switzerland, Salzburg in Austria, etc., have all adopted radiofrequency and electrical exposure standards 100 to 1,000 times more stringent than those in place in the UK, the United States, and Canada.

The Eastern standards were developed in the 1950's, just as Thomism was about to begin its decline in the West. The irony is palpable. Over the past century, we have experienced an epidemic growth of degenerative and reproductive diseases of all types. Soviet-era research clearly shows that these diseases are encouraged by ill-managed artificial electromagnetic emissions. And we wonder at our astronomical health expenses. For a comprehensive treatment of these questions, see Jean-Pierre Lentin's *Ces ondes qui soignent, ces ondes qui tuent* (Paris: 2001, Albin Michel).

It would appear that the last two decades of the XIXth century – just after *Aeterni Patris* – were decisive for the West. The medical effects of electricity were being investigated, but this work was suppressed by the reorganisation of mainline Western medicine according to the chemical paradigm. In addition, the discovery of radioactivity attracted most biophysicists away from bioelectricity. As a result, electrical medicine was virtually abandoned. The work of documenting these vital decades is being done by historians of science, including the Institute for the History and Philosophy of Science and Technology at the University of Toronto, headed up by our conference's keynote speaker, Dr. Paul Thompson. See in particular the paper by Vivien Hamilton, Doctoral candidate at IHPST-UT: “*The Curative Powers of Electricity: Appealing to Public Authority in Victorian Canada*,” presented on Tuesday, May 30, 2006, at the Canadian Society for History and Philosophy of Science, York University, Toronto, Canada.

The lack of a robust doctrine of substantial unity in science – such as would have been provided by hylomorphism – may have led to our unnatural technologies. Instead of focusing on the inherent unity of living organisms, XXth century science embraced reductionism. We have generated miraculous pharmaceuticals by manipulating their fundamental molecular structure. And the human being is increasingly being considered as a genetically manipulable, highly complex machine. But these reductionistic technologies have not given us harmony with natural living wholes. Degenerative diseases continue to emerge in new forms, and the environmental crisis looms over us.

## **6. The Role of the Church**

In the search for a scapegoat, “traditional” Western religion has been blamed for our environmental and health crises. We are seeing a widescale return to animism, pantheism, and the adoption of Eastern forms of religion. In this context, and in the context of our scholarly tradition, what of Catholicism?

What is the Church’s role in this environmental and health crisis? Some say that she has exacerbated it through her irresponsible answer to the instruction in the Book of Genesis, to “go forth and multiply, and subdue the Earth.” She is particularly criticized for her dogged opposition to artificial contraception, abortion, and embryonic cloning. She is seen to be partly to blame for global overpopulation, the AIDS crisis, and the lack of progress in finding cures to many diseases. But let us take a more historical view on the subject.

What has the Church been saying about scholarship and science? Ever since the XIIIth Century, the Popes have repeatedly called scholars back to Thomas Aquinas. This means a call back to Aristotle’s hylomorphic notion of substantial unity. (Aristotle himself considered hylomorphism a summit of difficulty: this might well explain the need for regular encouragement.)

In his encyclical *Aeterni Patris*, issued in 1879, Pope Leo XIII affirmed that Thomas’ thought could illuminate and guide the physical sciences:

Hence, also, the physical sciences, which now are held in so much repute, and everywhere draw to themselves a singular admiration, because of the many wonderful discoveries made in them, would not only take no harm from a restoration of the philosophy of the ancients, but would derive great protection from it. For the fruitful exercise and increase of these sciences it is not enough that we consider facts and contemplate Nature. When the facts are well known we must rise higher, and give our thoughts with great care to understanding the nature of corporeal things, as well as to the investigation of the laws which they obey, and of the principles from which spring their order, their unity in variety, and their common likeness in diversity. It is marvellous what power and light and help are given to these investigations by Scholastic philosophy, if it be wisely used.



On this point it is well to call one thing to your minds. It is only by the highest injustice that any jealousy of the progress and increase of natural sciences is laid, as a fault, at the door of that philosophy. When the Scholastics, following the teaching of the Holy Fathers, everywhere taught through their anthropology that the human understanding can only rise to the knowledge of immaterial things by things of sense, nothing could be more useful for the philosopher than to investigate carefully the secrets of Nature, and to be conversant, long and laboriously, with the study of physical science. Indeed, they themselves proved this by their works. Thomas, and Blessed Albert the Great, and other princes of the Scholastics, did not so give themselves up to the study of philosophy, as to have little care for the knowledge of natural things. Nay, on this matter there are not a few of their words and discoveries which modern teachers approve and acknowledge to be in harmony with truth. Besides, in this very age, many distinguished teachers of physical sciences openly bear witness that there is no contradiction, truly so called, between the certain and proved conclusions of recent physics, and the philosophical principles of the Schools.

We, therefore, while We declare that everything wisely said should be received with willing and glad mind, as well as everything profitably discovered or thought out, exhort all of you, Venerable Brothers, with the greatest earnestness to restore the golden wisdom of St. Thomas, and to spread it as far as you can, for the safety and glory of the Catholic Faith, for the good of society, and for the increase of all the sciences.<sup>88</sup>

For many readers today, this text is of strictly historical interest; it holds little authority in the present times; it may even appear quaint or naïve. However, science and reality have not changed so much that Leo's text has become obsolete. In fact, the text is prophetic in the sense that I have been developing all along: Thomistic principles are called to protect science and technology from disorder. And these principles – particularly the notion of substantial unity – have not been followed.

It is my contention that the absence of a robust notion of substantial unity in the science classroom has cost us dearly. Modern technology's lethal and unnatural growth has occurred in direct proportion with its disregard for the notion of substantial unity, especially in living things. Enthusiasm for artificial substances such as refined fuels, fractionated and reformulated foods, synthetic pesticides and pharmaceuticals has led to widespread ecological damage and a growing health crisis. The absence of a notion of substantial unity has also denied their natural philosophical foundation to the XXth-century attempts to re-establish harmony with Nature – with human nature, with the ecosystem, and with the planet as a whole.

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<sup>88</sup> Leo XIII, *Aeterni Patris*, as reproduced in the *Summa Theologica* of St. Thomas Aquinas, Vol.1. (Notre Dame: Christian Classics/Ave Maria Press, 1981), pp. xvii-xviii.

Still, an atomist and reductionist notion of substance appears to be all that is taught in our scientific and technological institutions. For example, the curative power of any medicinal product is held to exist at the molecular level. Chemical pharmaceuticals do produce impressive results; they can be patented, and this approach has led to great financial success. As a result, the holders of pharmaceutical patents control health research. And so the expensive search for cures to cancer, heart disease, Parkinson's, etc., continues at the molecular level, ignoring dozens of natural cures based on natural substantial wholes. These natural cures have been used in "underdeveloped" traditional cultures for decades and even centuries. However, they are under constant attack by the scientific establishment with its basic dissatisfaction with the variability of plant and animal substances and its insistence on molecular quantification and standardization. In the meantime, modern toxicology is faced with the impossible task of evaluating the synergistic interactions of thousands of toxic chemicals, in order to set proper environmental standards and human exposure limits. We have truly lost the forest for the trees.

### Conclusion

A significant portion of contemporary technology is waging war on natural substantial unity. How much did dissent among Thomists contribute to this state of affairs? Should a greater effort have been made to spread the doctrine? Some might say that the die was already cast with Descartes: experimental science would inevitably break away from formal and final causes.

In any case, it seems that we have lived a tragic failure. While philosophers have argued fine points of epistemology, Aristotelian and Thomistic principles have not guided and illuminated the physical sciences in their development, as Pope Leo had hoped they would. And today, we are at risk of missing the vital rendez-vous with the growing environmental movement in its attempt to bring our damaging technologies under control.

Aristotelian and Thomistic-friendly scholars are in a special position today. They can play a natural leadership role regarding science, technology, health and environmental matters. Would they be willing to engage in dialogue with environmentalists and alternative health advocates, whose power and influence are daily on the rise, but who appear to be bereft of the guiding lights of Aristotle and Aquinas?

In this respect, the recent efforts of Willis Jenkins, Pamela Smith, Jame Schaefer and Jill LeBlanc in developing the nascent field of *eco-thomism*, constitute promising avenues of reflection and exchange.<sup>89</sup> Eco-thomism

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<sup>89</sup> (1) Jill LeBlanc: "Eco-Thomism," in *Environmental Ethics* (USA), Volume 21, 1999, pp. 293-306. Professor LeBlanc teaches philosophy at McMaster University (Hamilton, Canada).

demonstrates fundamental links between ecological science and Thomistic principles of nature. These efforts might find an echo in hylomorphism-friendly environments such as Maritainian, Aristotelian, Thomistic and Catholic philosophical associations. If such an echo does occur, we will have grounds to hope that the travails of hylomorphism have not been in vain, and that the ancient doctrine is called to bear new fruit in the XXIst century.

### Dominican University College

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(2) Willis Jenkins: "Biodiversity and Salvation: Notes for an Eco-Thomism." Presented at the "Ecology, Theology, and Judeo-Christian Environmental Ethics" conference held at the University of Notre Dame, Indiana, in February 2002. Web site for full text:

[http://www.nd.edu/~ecoltheo/text\\_Jenkins.htm](http://www.nd.edu/~ecoltheo/text_Jenkins.htm).

(2a) Jenkins is quoted in Francisco Benzoni, "Thomas Aquinas and Environmental Ethics: A Reconsideration of Providence and Salvation," *The Journal of Religion*, volume 85 (2005), pages 446–476.

(3) Jame E. Schaefer, *Ethical Implications of Applying Aquinas' Notions of the Unity and Diversity of Creation to Human Functioning in Ecosystems (Doctoral Dissertation)*. Marquette University, 1994. 325 pages.

(4) Pamela A. Smith, *Aquinas and today's Environmental Ethics: An exploration of how the vision and the virtue ethic of 'ecothomism' might inform a viable eco-ethic (Doctoral Dissertation)*. Duquesne University, 1995. 405 pages. Sister Smith is Superior General of the Sisters of Saints Cyril and Methodius in Danville, Pennsylvania.

## **Saving the Wilderness: When Beauty is not enough**

Elizabeth Trott PhD.

Defending the preservation of wilderness seems to be a pressing concern. Arguments that appeal to the beauty of the wilderness are promoted by environmentalists and philosophers. Such aesthetic judgments are thought to give weight to the case for preservation. Yet the question can be raised: Is the beauty of the wilderness a sufficient reason to have wide range appeal? What is needed to give beauty that stature? One response has been given (by Glenn Parsons and others), that is to add scientific knowledge about the natural phenomenon at hand to the aesthetic judgments directed towards that phenomenon. Consider: Would an aesthetic judgment about the beauty of the wolverine's habitat be persuasive as a reason to preserve such habitat? And would supplementing such aesthetic judgments with scientific ones emphasizing the unusual features of the habitat be persuasive enough to preserve it from those who would trample it for personal pleasure or develop it for economic gain? This paper shall question the usefulness of beauty as an argument to defend wilderness preservation and question further efforts on the part of philosophers to bolster the status of aesthetic judgments of any kind with scientific knowledge.

### **The Problem of Definition**

We begin by considering one source of difficulty in making a case for the preservation of wilderness on aesthetic grounds: the indeterminate content of the concept of wilderness. It is difficult to discuss beauty when the *referent of*

*the concept of wilderness* is unclear. Wilderness is more delineated than nature, which can be understood as undisturbed settings in which life thrives without the interference of humanity. Nature includes trickling creeks, meadow wildflowers, as well as violent thunderstorms and foot-long scorpions. Roderick Nash in his book *Wilderness and the American Mind*,<sup>90</sup> has as a primary meaning for wilderness, being uncontrolled, unruly (the wild factor) conjuring thoughts of evil, as in need of bringing under the control of man, (directed to do so by God).<sup>91</sup> The meaning implied by this understanding of wilderness is that a man's paradise on earth is not beyond his control. The term wilderness, since this early usage, has acquired more metaphorical dimensions. If we feel stripped of guidance, lost or perplexed we are also "in the wilderness."<sup>92</sup>

### **Historical Beliefs and Expectations**

The problem of a definition for wilderness, particularly in North America, is compounded by the historical beliefs that new settlers had. Certainly when the settlers came to the North American continent they considered the vastness of the continent to be in a wilderness state, in other words, it was not under the control of their systems of order. Man was an alien presence in this new land.<sup>93</sup> This belief, of course, did not reflect the settlement conditions already in place. Indigenous peoples, (whom the Europeans at first thought were not quite people – they were thought to be some wild beings which lived more like animals than men) lived on the North American continent. Communities had been established, farming and fishing practices were not unknown; paths had been carved through forests; fences for managing animals had been built. Social orders, bartering systems, languages, etc., all were in place. The European declarations about taming the wilderness really meant bringing the continent under the control of European values and standards. The notion of unruly, wild, or out of control, that is, the world as *hostile other* reflects particular cultural perceptions. The non-European inhabitants of the newly "discovered" continent lived within their own social and ethical orders. The early association of wilderness with social and moral chaos on the part of the immigrant arrivals was originally an obstacle to any recognition of beauty in the wilderness.<sup>94</sup>

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<sup>90</sup> Roderick Nash, *Wilderness and the American Mind* (New Haven, Conn.: Yale University Press, 1967), pp. 36-38 – hereafter referred to as *Wilderness*.

<sup>91</sup> *Ibid.*, pp. 1-4

<sup>92</sup> *Ibid.*, p. 3.

<sup>93</sup> *Ibid.*, p. 7.

<sup>94</sup> Territorial orders, as a fact of the biological world, well preceded the orders of men. Alexander Kropotkin, a Russian biologist, published his book *Mutual Aid* in 1902. In

### Is the Wilderness Hostile?

The idea of wilderness as a *hostile other* raises questions about what really counts as an example of *hostile other*.<sup>95</sup> What is a primeval state of nature? If you can visit such a place is it still wilderness? Perhaps wilderness is just an idea, a mental construct that has evolved and we apply it to places for various reasons. Nash goes on to suggest that wilderness and civilization are concepts that distinguish degrees of human involvement in places, not differences in kinds of places.<sup>96</sup> The wilderness is an idea that is part of a continuum of our understanding of places, and some places involve more people than others. The *problem* about how to preserve something we call the wilderness as if it were some stuff out there, is really a question: How much human involvement should determine the various distinctions that turn the environment into *places*? Places are identified by human needs, values, and experiences. They are the products of the human imagination. Wilderness is a place born out of our imagination where human intervention is both difficult and often life threatening to those unfamiliar with the skills required to live there. Presumably the less we have altered the environment, the more we think it is wilderness. Government national parks with well marked trails and campsites seem more to be wilderness in kind than streets. People retreat to these wild places to escape the chaos and life threatening risks of cities. Because both environments could be described as wilderness (not under the control of human systems of valuing and ordering), it isn't clear which is the better candidate for being called wilderness. National parks can be marked out in large scale or constructed in small scale as envisioned by a human imagination. Anywhere there is a trail used by people there is a degree of civilization.<sup>97</sup> Every surface square inch of this planet has been mapped, studied, photographed, and documented.

Concepts of wilderness today are not as much a reflection of the Christian ethos which associated lack of order with moral degeneracy. Freed from the weight of the discourse of darkness, evil, and Hell, places of the wilderness can simply be understood as places identified by a pronounced lack of

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it he demonstrated through his meticulous observations that living biological systems are both cooperative and competitive. Total competition as a principle of nature does not explain the complex integration of members of ecosystems. The wilderness has never been without principles of order.

<sup>95</sup> Efforts to find a definition for wilderness efforts have been made by Western governments. See Nash, *Wilderness*, pp. 5-7.

<sup>96</sup> *Ibid.*, p. 6.

<sup>97</sup> One might presume that every square inch of this planet's surface has been mapped, photographed and documented, testimony to some kind of human intervention everywhere.

knowledge and abilities to live in them.<sup>98</sup> Perhaps untamed wilderness is just another way of saying no running water, hydro lines or cell phone junctions. As far as surviving in the wilderness goes, we have figured out how to survive in almost any circumstance of environmental difficulty that we can anticipate or know about.

Yet the risk of not surviving in the wilderness is greater because the forces of the wilderness are less predictable. Losing a life trekking in the mountains we consider a risk of being in the wilderness. It is interesting that some insurance companies recognize “acts of God” for example, in house damage from unexpected natural assaults, but not in slipping off a mountain side because of an unexpected sudden rain. Yet the cause of both events is the same. Both events are caused by forces of the environment that have not been brought under our control.

### **Can What is Hostile be Beautiful?**

The wilderness understood as the *hostile other* (meaning difficult for people to survive) doesn’t intuitively bring to mind ideas of beauty. Lack of order and moral degeneracy certainly don’t incline us to seek properties of beauty, but what about places that are simply challenging, requiring struggle and patience? Is the concept of a difficult environment compatible with its also being beautiful?

One response could be that there are many environments which are both visually beautiful and yet difficult for human survival, such as Niagara Falls, or the deserts in Utah, or underwater coral reefs. A reply to that claim is that these environments lack at least one life supporting element, respectively shelter from powerful forces, water and protection from extreme temperatures, and air. One doesn’t expect to survive without extraordinary preparation and planning. We admire their beauty from a safe distance or during a short term visit as spectators, but not as inhabitants. Wilderness may not lack any of the elements of survival but is overwhelming difficult to live in nonetheless and equally difficult to admire, for when immersed in a dark forest, where is the view point?

### **Seeking the Beautiful in Wilderness: Kantian Judgments**

We can conclude that the concept of wilderness is a man-made idea reflecting our relation to the world of our experiences.<sup>99</sup> That relation is viewed

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<sup>98</sup> Even this definition does not suffice, because there is always someone who knows how to survive in conditions which others may call wilderness.

<sup>99</sup> For a further discussion of nature and wilderness as a human concept, see Anna L. Peterson “Environmental Ethics and the Social Construction of Nature,” *Environmental*

differently through the principles and precepts of different world philosophies.<sup>100</sup> Those very different philosophies alert us to the fact that beauty can be understood as a human category of judgment, an aesthetic judgment. This position has been most strongly associated with Kant in his *Critique of Judgment* and is the most appropriate theory for explaining the claims about nature, or the wilderness as being beautiful.

Instead as associating intrinsic beauty-making properties with the wilderness, we should regard it as the inspiration for aesthetic judgments. Because the meaning of wilderness is indeterminate it is unlikely that agreement will be reached on its intrinsic properties given that the source of those properties has no universally agreed upon categorical referent.<sup>101</sup> To regard beauty as judgment allows us to discuss wilderness without expecting a principle of universality to convince our fellow discussants. What is universal is our capacity to recognize aesthetic claims and know what is being claimed without having to agree.<sup>102</sup> Our ability to make aesthetic judgments “reveals something new and essential about us as human beings.”<sup>103</sup> Thus we have a capacity to make judgments of taste reflecting cognitive pleasures and displeasures. But there is little in Kant to assure us that we will all experience the same aesthetic pleasure for every experience that inclines us to judge our response to it through the disinterestedness of feelings without cognitive restraints. If there are principles of beauty, such as harmony and balance and other properties determined to be pleasing to the perceiving mind, then their existence in the wilderness is derivative upon our ability to constitute our experiences through the above principles of beauty as they are applied by the exercise of our aesthetic judgments.

But not everyone will have the perceptual sophistication to experience the beauty such judgments bring forth, and not everyone will choose to exercise such judgments. Indeed the choice to not exercise such judgments could be lifesaving when engaging in aesthetic indulgences in the wilderness. This

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*Ethics: Divergence and Convergence*, eds. Susan J. Armstrong and Richard G. Botzler (Boston, Mass.: McGraw-Hill, 2004), pp. 87-94.

<sup>100</sup> For a discussion of these differences see Nash, *Wilderness*, pp. 20-22.

<sup>101</sup> Those that support beauty as sustained by extrinsic properties such as balance and harmony must attribute to nature an aesthetic intentionality, presumably created and sustained by God.

<sup>102</sup> See R. K. Elliott, “The Unity of Kant’s ‘Critique of Aesthetic Judgment,’” *The British Journal of Aesthetics*, July 1968, Vol. 8, No. 3, p. 245. “And even if we assume that all men are capable of aesthetic experience, and that aesthetic experience involves the feeling of an optimal ration of the cognitive powers, this ratio need not be the same for each individual.”

<sup>103</sup> Christian Helmut Wenzel, *An Introduction to Kant’s Aesthetics: Core Concepts and Problems*. (Malden, MA, Oxford: Blackwell Pub., 2005), p. 3.



critical fact of choice means that aesthetic judgments about the wilderness are neither universal nor necessary. Seeing beauty in the wilderness is a learned experience, and this experience can be disregarded more easily in regards to the wilderness than when a specific effort has been made by an artist-creator to address aesthetic principles in his/her creations of things, places and designs.

### **Promoting Beauty in the Name of Preservation**

We can now ask: Will extolling the beauty that some perceive in the wilderness environments serve as a reason for its preservation? If enjoying its beauty were a guaranteed experience then one would think that promoting such beauty would be a good thing to do. But I think there are weaknesses in this position. Consider first the conveniences required to enjoy the beauty of wilderness environments.

The argument that we should preserve the wilderness because it is beautiful has much to do with our development of amenities that make it possible for us to relax on some shoreline instead of having to chop wood to prepare supper.<sup>104</sup> Tom Thompson had to have a cabin in which to store and mix his paints and a pail in which to wash his brushes before he could start capturing on his canvasses the beauties of the world north of Toronto. He didn't just wander off into the bush and paint the wilderness. Seeing beauty in the wilderness often means being able to look at the wilderness from an airplane or from some vista viewpoint where someone has conveniently put a little roadside parking space for gazing from a car window (especially if the mosquitoes are bad). Such experiences of beauty are not guaranteed by definition just because one thinks one is in a wilderness environment, no matter how sophisticated one is as a perceiver. For example, there is nothing particularly beautiful about hauling one's canoe through dense shoreline bush filled with thick spider webs in the rain hoping to be in the area of a mapped campsite. (Unsettled environments can offer spectacular visions, more easily seen when one is warm and dry.)

### **The Role of Judgment and Choice in Recognizing Beauty**

Positive aesthetic recognition of wilderness requires more than convenience and good weather. It requires a decision to recognize through an aesthetic category of judgment what the senses provide. While such recognition may engage a universal human capacity, this capacity for beauty recognition is not automatically triggered without reflection and reflection is a choice that we make. We will never know if those who are being killed by a raging river

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<sup>104</sup> Nash concludes in his explorations of the wilderness that arguments for its preservation primarily concern the needs and values of civilized people. See Nash, *Wilderness*, p. 271.

current or forest fire, or experiencing snow suffocation or freezing limbs, have as their last thoughts how beautiful their world really is.

I am not suggesting that the wilderness does not appear beautiful from different perspectives etc., but with every judgment we make, our values and expectations, our needs and comfort zones, our general understanding of risks and hazards affect the judgment. For example, our skills at surviving, contribute enormously to our perceptual claims about beauty in the untrammled world. One person, even though a swimmer and quite secure in a life jacket, can be terrified in a canoe and fail to see beauty anywhere until he or she has the knowledge and skill level to manage the canoe and realize canoes can be quite safe, though not in all circumstances. The point I would make, is that some aesthetic judgments such as those which can be evoked or activated in art galleries, or in controlled city environments, can be enhanced by knowledge of the history of art, or the various art movements. The aesthetic judgments no doubt are accompanied by knowledge that is related to the object or performance or design. But aesthetic judgments in the wilderness require circumstances of appreciation which themselves require knowledge that has little to do with what is being seen or heard or felt. This knowledge is of temperatures and sound implications and principles of change, factors of survival. Such factors have little bearing on the actual aesthetic judgment. Consider the following example. Being mesmerized in one's canoe by the beautiful mist rising round a corner in a river could detract one from the fact that the mist is being caused by a waterfall. Watching the rapid changes in the clouds above is the last thing one wants to do if those changes signal a coming thunderstorm. Aesthetics judgments, while certainly possible in the wilderness, may need to be restrained in light of more pressing cognitive content.

### **The Problems with Marketing Beauty**

The beauty of the wilderness is not a strong argument for the preservation of wilderness because admiring that beauty without cognitively attending to a myriad of non-aesthetic judgments could seriously threaten one's life. A conclusion that could follow from these observations is: Get rid of what threatens human life. Tame the park, turn it into pastoral nature, or development properties; leave it natural, but not hostile. This is not the conclusion sought after by those who want to preserve the wilderness.

There is a corollary to the promotion of the wilderness as beautiful. Once we extol the beauty of the wilderness, (assuming we support the position that we need more beauty in the world and the wilderness provides a great deal) then people will want to partake of such experiences. Perhaps they will want to buy an SUV with which to look at how attractive the pristine world is.

Wise folks know that is exactly what we do not want people to do. So how does one promote the wilderness through being an advocate of its beauty without having everyone else rushing about on one's favourite canoe routes? Furthermore with the novice beauty enthusiasts filling up the wilderness, the wilderness becomes crowded. Some people will go not properly prepared. Others will upset the local inhabitants, who may respond by eating the odd intruder. Government employees then shoot the threat to human life, and nature lovers park their cars and tents all over sensitive environments to stage a protest. The end result is that in the name of beauty the wilderness is further under assault. Perhaps wilderness defenders really mean that they want every one **other than themselves** to stay away from the beauty. To preserve the wilderness we have to have reasons that make sense to persons other than those who are sufficiently wealthy and skilled to visit and admire its beauty.

### **A Philosophic Conjunction: Aesthetics and Science**

Some philosophers, (notably Glenn Parsons and Alan Carlson) have tried to strengthen the beauty argument in relation to nature, (if not the more specific wilderness) by trying to associate aesthetic judgments with scientific ones presumably thereby making a more universal case for the beauty arguments. The position argued for is that scientific knowledge reveals much that is unexpected and our responses to this cognitive content, when positive, count as aesthetic judgments (Parsons 2002).<sup>105</sup> What kind of scientific content will augment one's aesthetic appreciation of natural phenomenon?

Certainly Parsons and his contemporaries would have us best learn to appreciate nature through scientific knowledge. Parsons suggests that when faced with knowledge that reveals the unexpected, our initial reactions to that experience, of surprise, or shock or wonder, are aesthetic ones. The reaction could involve the ugly as well as the beautiful and Parsons example is of the ugliness of a Venus fly trap (2002). He refers to the jaw-like formation as a contra standard piece of knowledge, one we do not expect to associate with plants. In spite of the possibility of such negative aesthetic reactions, Parsons suggests that we should regard nature, (and presumably teach others about it) by focusing on the categories of science which reveal its positive side (2002, p. 293). As we grow to understand more about the natural world, with the

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<sup>105</sup> In what follows I shall be referring to work done by Glenn Parsons appearing in the *British Journal of Aesthetics*: "Nature Appreciation, Science, and Positive Aesthetics," Vol. 42, No. 3, July 2002; "Natural Functions and the Aesthetic Appreciation of Inorganic Nature," Vol. 44, No. 1, January 2004; "Freedom and Objectivity in the Aesthetic Appreciation of Nature," Vol. 46, No. 1, January 2006. I shall refer to articles by year of publication.

emphasis on its positive aesthetic features, we will be more inclined to support its preservation. The knowledge itself becomes the source of its beauty.

Parsons is not the first philosopher to associate beauty with knowledge, but when Plato made the connection he insisted that the knowledge most significant to beauty was moral goodness. Beauty prior to the separation of the moral and the beautiful demanded of us moral cognitive awareness. Once the moral and the aesthetic parted ways, the aesthetic found home in the discourse of the art world, and while discussions of nature were plentiful, they reflected the visual spectator's point of view, not the active wilderness visitor. This new excursion (suggested by Parsons) into associating the aesthetic judgment with non-aesthetic categories of knowledge raises serious questions. What guides our choice of the particular scientific content to be associated with positive aesthetics? In promoting some aspects of scientific knowledge to enhance the beauty of nature, (or the wilderness) what other kind of knowledge might be suppressed or neglected? Could we be lured into making an aesthetic judgment while failing to note some morally relevant information that could be equally scientific? (How much information should be promoted about the health risk of ground ticks?)

### **An Example of Matching Science and Aesthetic Judgments**

Consider the following example: The individual who is enamoured of the Temagami wilderness studies its rock formations, its geological history, its diverse wildlife. With considerable marveling and care he/she documents this information, and then, determined to convince others about its precious uniqueness, begins to publish travel guides and organize visits to the area – teaching trips that include science that will let the positive aesthetics reign. Parks Canada soon has to regulate the number of visitors in the park, and in order to finance the patrols and administer the trip permits, negotiates to begin selling old growth forest wood. The native bands and inhabitants find lucrative employment, their views of what is beautiful being informed by a different philosophical culture. The wilderness shrinks, being overrun by logging roads, and plastic water bottles. The scientific knowledge invited the appreciation of the beauty of the wilderness but also contributed to the escalation of its loss. The scientific knowledge needed will not be focused on supporting aesthetic judgments about beauty, but on supporting moral judgments about human behaviour and how much human presence the wilderness can absorb, before it evolves from wilderness to a natural man-controlled park. The question being raised here concerns the association of scientific and aesthetic content independently of a moral context. Could we, through such a choice of cognitive categories, be mistaken and generate a reaction of aesthetic wonder (short-lived though that may be), when moral

outrage, born out of the greater perspective of preserving habitats for living things could be a better response? Our finding beauty in the wilderness requires wilderness, and that requires moral decisions that have little to do with aesthetics judgments discussed today.<sup>106</sup>

### **Wilderness as Economic Resource**

The perspective that we cannot avoid is the wilderness as a resource or as an economic factor. Preserving the wilderness is largely deciding how much intervention there should be. When the continent was first being settled, its riches fell under the categories of resources, and agricultural land to live on. Logging companies may agree that the woods look pretty, but with economies and profits at stake that is not an over-riding reason not to log, anymore than the argument that cattle look pretty has prevented the slaughter of them for food and other uses.<sup>107</sup> We are creatures who want to possess and control our environment.

Everyone knows that some parts of the resource industry are short lived in the long run. Drastic measure like seriously controlled population growth on a world scale might lower demand for wood or oil. Meanwhile we will exploit resources as long as the economy demands them. And as trees disappear, new jobs will be necessary. Perhaps the solution is in the other direction. We need to demonstrate that the viability of the tourist industry in the long term will need the wilderness for tourists to view. The more wilderness that we can make accessible to people, the more the need for wilderness to not be tampered with so that *it remains as people imagine it*. The beauty of the wilderness is economically of high value, a capital good for everyone. Selling people on the need for the protection of eco systems and the environment when based on recreation, health, pollution, spiritual renewal, getting a beauty fix, loving space and the great outdoors, (which some people despise) etc., has not yet grabbed the public imagination. By setting out the research and data that economies depend on protection not exploitation of wilderness environment, less settled places would have a better chance at

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<sup>106</sup> Parsons work seems to be an exercise in conceptual analysis. Such projects are of philosophic interest. But with the wilderness under as much assault as it is, conceptual analysis carries little weight as a practical tool. Such excursions belong to the academy of aesthetic discourse. The preservation of the wilderness requires some morally charged arguments beginning with the fact that wilderness will disappear long before man-made creations. Does this bother anyone? It seems a travesty of the intellect to treat nature and the wilderness as a problem for philosophical exercises.

<sup>107</sup> The celebration of a scenic view point in Georgian Bay did not prevent people from buying the point of land, thereby preventing others from gazing from that point. Building a cottage on that scenic spot for viewing the Bay may well have destroyed the view others across the lake might have had of the “viewpoint” location as they gazed from their cottage.

keeping their place in the order of things, which now is a human imposed order.<sup>108</sup> If beauty is to be a reason for preserving wilderness, the reasons will have to sway everyone, not just those fortunate enough to be able to travel and survive there while others sweat in the cities.

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<sup>108</sup> We invented capitalism and cling tenaciously to it, so we might as well market preservation in the universal language. Tree hugging, no matter how much true real and emotionally wrenching love there really is for trees, achieves little.

# Dialectic and Demonstration in the Philosophy of Nature

Christopher S. Morrissey

## 1. Aristotle's Definition of Science as Certain, Causal, and Demonstrative

Modern thought has acquired a prejudice about the relationship between dialectic and demonstration. In this prejudice, dialectic is characterized as *induction* that attains only *probable* knowledge. Additionally, demonstration is characterized as *deduction* that attains *certainty*. But this modern characterization is a false dichotomy. Moreover, the false dichotomy is oblivious to the careful treatment of deduction and induction that has been preserved in the Aristotelian-Thomistic tradition. In order to begin to correct the false understanding of dialectic and demonstration (which we inevitably acquire from our current cultural milieu), I argue we need to call to mind Jacques Maritain's careful treatment of deduction and induction, for which Maritain is indebted to John of St. Thomas.<sup>109</sup> True, there are some minor reservations that Aristotelian Thomists should still have about Maritain's understanding of dialectic and demonstration;<sup>110</sup> but these reservations can be

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<sup>109</sup> For my account, I am greatly indebted to John Deely's path-breaking and illuminating exposition of the history of this false dichotomy in *Introducing Semiotic: Its History and Doctrine* (Bloomington: Indiana University Press, 1982), pp. 67-82. For the pertinent quotations from Maritain on deduction and induction see Deely, *ibid.*, pp. 181-184, who quotes Maritain's *Formal Logic* (trans. 1937).

<sup>110</sup> For the requisite improvements upon Maritain, see Benedict M. Ashley, O.P., *The Way toward Wisdom* (Notre Dame, Indiana: University of Notre Dame Press, 2006), pp.

answered and accommodated by the River Forest Thomists' treatment of dialectic and demonstration.<sup>111</sup> My thesis is that the distinctions made by John of St. Thomas about induction (to wit, "ascending" induction and "descending" induction) are analogous to what William A. Wallace describes in his treatment of the "demonstrative regress" in scientific method (a treatment of the philosophy of nature that offers subtle improvements upon Maritain's).<sup>112</sup> In order to help you see the truth of this, let me remind you about the correlatively dialectical and demonstrative methodology of the philosophy of nature. To do this, I wish to remind you of Aristotle's definition of science and then explain how it is related to his correlatively dialectical and demonstrative method.

Aristotle defines science neither too broadly nor too narrowly, but precisely: "Science is certain knowledge through causes and effected by demonstration."<sup>113</sup> This definition may seem confusing, especially the phrase "certain knowledge." (For one could ask whether "uncertain knowledge" is still knowledge or whether it is better termed "belief.") To make clear its

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44-169, who rectifies the "unfortunate position" of Maritain (which divides the sciences along *perinoetic* and *dianoetic* lines) as identified by John Deely, "The Impact of Evolution on Scientific Method," in John Deely and Raymond J. Nogar (eds.), *The Problem of Evolution*, (New York: Appleton-Century-Crofts, 1973), p. 33 n. 53, p. 35 n. 61, p. 69 n. 172, and p. 70 n. 174. Cf. Jacques Maritain, *The Philosophy of Nature, To which is added, "Maritain's Philosophy of the Sciences,"* by Yves R. Simon (New York: Philosophical Library, 1951) and Jacques Maritain, *The Degrees of Knowledge, Collected Works, Vol. 7*, trans. Gerald B. Phelan (Notre Dame, Indiana: University of Notre Dame Press, 1995).

<sup>111</sup> Cf. Benedict M. Ashley, O.P., "The River Forest School and the Philosophy of Nature Today," in R. James Long (ed.), *Philosophy and the God of Abraham: Essays in Memory of James A. Weisheipl, O.P.* Papers in Mediaeval Studies 12 (Toronto: Pontifical Institute of Mediaeval Studies, 1991), pp. 1-15.

<sup>112</sup> The River Forest treatment is epitomized in William A. Wallace, *The Modeling of Nature: Philosophy of Science and Philosophy of Nature in Synthesis* (Washington, D.C.: The Catholic University of America Press, 1996). Cf. William A. Wallace, *Causality and Scientific Explanation*, 2 vols. (Ann Arbor: University of Michigan Press, 1972-1974).

<sup>113</sup> This is the compressed formulation of Aristotle's definition of science from Aristotle, *An. Post.* 71b 9-16 as made by William A. Wallace, O.P., "Some Demonstrations in the Science of Nature", in Dominican Fathers of the Province of St. Joseph (eds.), *The Thomist Reader, Texts and Studies, 1957* (Washington, DC: The Thomist Press, 1957), pp. 90-118. I quote the text of Wallace from p. 91. Cf. the manuscript of James Athanasius Weisheipl, O.P., *Aristotelian Methodology. A Commentary on the Posterior Analytics of Aristotle* (River Forest: Pontifical Institute of Philosophy, 1958), p. 2, and Vincent Edward Smith, *The General Science of Nature* (Milwaukee: Bruce Publishing, 1958), p. 4.



content, let me restate it, quoting portions from the Latin translation which St. Thomas used, to which it corresponds, and with which it may be clarified: “Science [*scire unumquodque simpliciter*] is certain knowledge [*quoniam illius causa est propter quam res est*] through causes [*cum causam arbitramur cognoscere*] and effected by demonstration [*et non est contingere hoc aliter se habere*].”<sup>114</sup> And perhaps it is most helpful to restate it once again, in order to give fewer Latin terms for each key English word: “Science [*scire*] is [*est*] certain [*simpliciter*] knowledge through causes [*causam cognoscere*] and effected by demonstration [*per scientialem syllogismum*].” In other words, science is both *inductive* cognition and yet also effected by *deductive* demonstration. That is, science simply grasps the cause of something in a kind of *intuitive cognition*; yet this intuitive grasp of the cause is also somehow correlatively consolidated as being *necessarily so* by demonstration.

Note that science (*scientia*) is the species being defined, and its genus is cognition (and thus *knowledge* in the generic sense is represented by the Latin term, *cognitio*). In other words, science is a specific type of cognition, i.e., a special type of knowledge. Sometimes people take the word *knowledge* to be synonymous with *science*; for such has been one venerable, traditional way of translating *scientia*. But that is not the meaning of *knowledge* here for us. Here, *knowledge* is the more general term, i.e., the genus of cognition in general, of which *science* is the species to be defined.

Continuing to clarify Wallace’s compressed formulation, I notice how we may parse out three terms (*certain*, *causal*, and *demonstrative*), each of which correspond to the parts of the definition given by Aristotle<sup>115</sup> to define the species *science* of the genus *knowledge*. *Causal*, i.e., *through causes*, represents the first stipulation given by Aristotle,<sup>116</sup> *cum causam arbitramur cognoscere*: viz., we know “the cause from which the fact results.” *Certain* represents the second stipulation,<sup>117</sup> *quoniam illius causa est propter quam res est*: viz., we know “that it is the [proper] cause of the fact.”<sup>118</sup> *Demonstrative*, or *effected through demonstration*, represents the third stipulation, *non est contingere hoc aliter se habere*: “and that the fact cannot be otherwise.” Demonstration is a scientific syllogism, i.e., a syllogism that

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<sup>114</sup> I quote the Latin translation of the Marietti edition of the Aquinas in my italics.

<sup>115</sup> Aristotle, *An. Post.* 71b 9-16.

<sup>116</sup> Aristotle, *An. Post.* 71b 11-12.

<sup>117</sup> Aristotle, *An. Post.* 71b 12.

<sup>118</sup> Or as William A. Wallace, *The Role of Demonstration in Moral Theology: A Study of Methodology in St. Thomas Aquinas* (Washington, D.C.: The Thomist Press, 1962), p. 16, puts it: “we know that that cause is what makes the object to be what it is.”

allows us to achieve scientific knowing by the mere fact that we grasp it: *scientialem syllogismum dico secundum quem in habendo ipsum scimus*.<sup>119</sup>

In other words, the *form* of the syllogism guarantees that, simply by the fact that it is executed, its conclusion cannot be otherwise. Now, a flaw in the conclusion of a syllogism can only be due to a *material* flaw in its premises. But if its premises indicate proper causes of the fact, as Aristotle specifies with the first two stipulations (*causal* and *certain* – in the compressed formulations I have adopted from Wallace), then the conclusion cannot be otherwise, provided that the syllogism is in the proper form. Its proper form is that which guarantees the results of science. For in the demonstrative syllogism, i.e., in the scientific syllogism, we reason from premises more certain *quoad nos* “as far as we’re concerned”) to conclusions more certain *quoad se* (“as far as the thing itself is concerned”).<sup>120</sup>

It is most important to recognize that the three stipulations given to identify scientific knowledge (*certain*, *causal*, and *demonstrative*) are grounded in Aristotle’s text. The widespread failure to understand the interrelation of dialectic and demonstration is due most of all to the prejudice that the modern conception of science is somehow superior to Aristotle’s. By focusing on Aristotelian methodology, i.e., the careful elucidation of definition and demonstration in key Aristotelian-Thomistic texts, I argue that Aristotle’s definition of science is “truly scientific” (i.e., possessing what Maritain would call true certainty)<sup>121</sup> and superior to the self-understanding of modern science. To clarify how dialectic and demonstration works correlatively in the Aristotelian sense of what science is (and not as in the modern dichotomy between the two), I turn now to discuss how the *principles of a demonstration* are for Aristotle central to both dialectic and demonstration.

## 2. Certainty Attained in the Demonstrative Ordering of Proper Causes

If physical science, in its demonstrations, is to be *certain knowledge in terms of causes*, as defined above, then “it needs principles to be causal knowledge and first principles to be certain knowledge.”<sup>122</sup> In other words, the scientific knowledge of physical science will be *causal* but these causes must be *proper*, i.e., they must be founded on *certain* knowledge of the causes. In Aristotle’s own formulation, it is not just knowledge of “the cause from which the fact

<sup>119</sup> Aristotle, *An. Post.* 71b 17-19. Latin trans. Moerbeke.

<sup>120</sup> Wallace, *Role of Demonstration*, p. 21. Translations mine, but I follow Wallace’s preference for the pithy Latin terminology.

<sup>121</sup> Wallace, “Some Demonstrations,” p. 91.

<sup>122</sup> Vincent Edward Smith, *The General Science of Nature* (Milwaukee: Bruce Publishing, 1958), p. 11.

results” but also “*that* it is the cause of the fact;” i.e., not just *causal*, but also *certain*. And the certainty of what is predicated of the subject matter of a science depends on the subordination of that science within the architectonic of knowledge. If the reasoning within a particular science is properly founded both on first principles extrinsic to the science and through mediate principles intrinsic and proper to the subject matter within it, then it is scientific reasoning that is certain in Aristotle’s sense, because it can be traced back in a chain of syllogisms right up to first principles which are self-evident and therefore absolutely certain.

What this means is best expressed by showing the possible types of *causal* and *certain* demonstrations. There can be demonstrations of the fact (*quia*), and demonstrations of the cause (*propter quid*). The former (*demonstratio quia*) are more characteristic of *science* in its merely *causal* sense, i.e. as knowledge *through causes*.<sup>123</sup> The latter (*demonstratio propter quid*) is, however, more characteristic of science in its *certain* sense, i.e., as *certain* causal knowledge.<sup>124</sup> The meaning of “certain” here, however, is not an otiose synonym for “demonstrative,” but instead indicates the dignity of the demonstration (and perhaps would be better put in English as “proper knowledge” than as “certain knowledge” [*scire simpliciter*]).<sup>125</sup> The dignity of the demonstration, whether it is “better” (*potior*)<sup>126</sup> than another demonstration or not, is based on the order of predication in the demonstration. Before I explain what this “order of predication” is, we should first be clear on the relation between science and demonstration.

I have set forth the Aristotelian conception of science as certain, causal, demonstrative knowledge. I stated that Aristotle’s definition of science contains three stipulations, one of which is the stipulation *demonstrative*. However, looking at the text, apparently Aristotle defines demonstration separately from science. For Aristotle, *science* is certain knowledge of things in terms of *proper* causes or reasons or principles.<sup>127</sup> *Demonstration*,

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<sup>123</sup> Note that the most general mark of science’s type of knowledge is *knowledge through causes*.

<sup>124</sup> Note that the more specific mark of science’s type of knowledge is *certain knowledge through causes*.

<sup>125</sup> In other words, “Science is proper knowledge through causes and effected by demonstration.” But I stick with the formulation of Wallace, “Some Demonstrations”, p. 91: “certain knowledge.” For, in another way, this formulation is superior, because it also covers the other sense in Aristotle of the concept “certain,” i.e., particular (*scire unumquodque simpliciter*). And this is appropriate for Aristotle, for whom “certainty” is not merely a formal, logical concept, but rather the demonstration appropriate for the particular subject matter: *quoniam illius causa est propter quam res est*.

<sup>126</sup> Wallace, *Role of Demonstration in Moral Theology*, p. 20.

<sup>127</sup> Aristotle, *An. Post.* 71b 9-16.

however, is a syllogism *producing* such knowledge.<sup>128</sup> But, in fact, these are not two separate definitions of two different things. The definition of demonstration simply follows the definition of science, in order to make clear what the third stipulation means: i.e., science, most properly speaking, is *demonstrative*.

These two definitions of *science* and *demonstration* are two ways of expressing the same thing. The two definitions are related in the following way. The relation between science as *certain knowledge through causes*, and science as *effected by demonstration*, is a relation clarified only when we understand what the principle of a demonstration is. *The middle term* of a demonstrative syllogism represents the cause or reason or principle for connecting the major term with the minor in the conclusion.<sup>129</sup> *Demonstration* is a syllogism in which the causal knowledge or middle term is certain; and it therefore yields certain knowledge in terms of causes, i.e., it yields *science*.<sup>130</sup>

But what makes a middle term *certain* in itself? This is a very important question. It brings us back to the question of the order of predication in demonstrations. For the certainty of middle terms admits of gradation: i.e., considered with regard to the subject of the demonstration, *some causes are more proper than others*. For a demonstration to be certain, a middle term must be proper with regard to its subject.

When perfected, science is knowledge through *proper* causes.<sup>131</sup> In knowing proper and precise (as opposed to common and imprecise) causes, the mind knows better “how one thing differs from another.”<sup>132</sup> This means knowing the subject matter of a science better.<sup>133</sup> “A middle term that represents a proper cause of a subject is a ‘commensurate universal’ of that subject; i.e., it is appropriate to, and coextensive with, the subject in question.”<sup>134</sup>

Let the subject of a demonstration be S. The form of demonstration is: “(All) M is P, but (all) S is M; therefore, (all) S is P.”<sup>135</sup> The middle term M has to be proper to S. (This means it is all or part of the real definition of

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<sup>128</sup> Aristotle, *An. Post.* 71b 17-18.

<sup>129</sup> Smith, *General Science of Nature*, pp. 4-6.

<sup>130</sup> Cf. *Ibid.*, p. 5: “Demonstration, then, is a syllogism in which the causal knowledge or middle term is certain. Put into other form, knowledge resulting from demonstration is always a certain knowledge in terms of causes, precisely what Aristotle called *science*.”

<sup>131</sup> Aristotle, *An. Post.* 71b 10-11.

<sup>132</sup> Smith, *General Science of Nature*, p. 6.

<sup>133</sup> *Ibid.*, pp. 5-6.

<sup>134</sup> *Ibid.*, p. 6.

<sup>135</sup> Wallace, “Some Demonstrations,” p. 94.

S.)<sup>136</sup> Discovering the proper M for a demonstration about S is not an exercise in logic, as if any observation could be plugged into a chain of dry reasoning. On the contrary, discovering the proper M that explains the predication of P to S is a genuine advance in knowledge, because it will clarify all other strands of scientific reasoning, showing how the principle M of this demonstration places the conclusion about S (“S is P”) in relation to all other known principles, whether extrinsic or intrinsic to the matter under consideration. Otherwise, the demonstration utilizing M will simply be less certain, because it will be a demonstration not of the *reasoned* fact (*propter quid*), but merely of the fact (*quia*).

For example, consider the negative demonstration that a wall does not breathe because it is not living.<sup>137</sup> S is the wall, M is “not living” and P is “not breathing.” M is not a proper cause and hence the demonstration, although still *a priori* (because M is a cause and not an effect of P), is only a demonstration of the fact (*quia*). M is a remote cause. “Many living things do not breathe, and yet the fact of the wall’s not being alive is sufficient here to explain its not breathing.”<sup>138</sup> The proper cause of the wall’s not breathing is not having lungs. But if M were “not having lungs” instead of “not living” then the demonstration would be *propter quid*.

Science in the Aristotelian sense, then, is produced by demonstration. Demonstration can be causal (*propter quid*) or factual (*quia*). The *propter quid* middle term is the real definition (at least in part) of the subject, and hence it provides the real cause or reason why the attribute belongs to the subject. The *quia* middle term usually represents the cause or reason why we know that the attribute belongs to the subject; it is not the *proper cause in reality itself* why this is so. In general, *demonstratio propter quid* goes from cause to effect (i.e., is *a priori*) and *demonstratio quia* goes from effect to cause (i.e., is *a posteriori*). For modern thought, the former appears to be a “deductive” movement and the latter an “inductive” one; but this simplistic dichotomy blurs something very important. Demonstrations *propter quid* and demonstrations *quia* do not form a strict dichotomy between *a priori* reasoning (cause to effect) and *a posteriori* reasoning (effect to cause), because there are cases of *quia* demonstrations that are in fact *a priori*. For example, this occurs when an *a priori* demonstration is made from a remote

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<sup>136</sup> What a “real definition” is is best discussed in Vincent Edward Smith, “Definitions” in *From an Abundant Spring: the Walter Farrell memorial volume of The Thomist*. Edited by the staff of *The Thomist* (New York: Kenedy, 1952), pp. 337-362, and in Wallace, *Modeling of Nature*, pp. 285-292.

<sup>137</sup> Aristotle, *An. Post.* 78b 15-27.

<sup>138</sup> Wallace, *Modeling of Nature*, p. 295.

but not a proper cause, as in our example of the wall not breathing because it is not alive. Table 1 sums all this up schematically:<sup>139</sup>

**Table 1**  
**Certainty in Demonstrations Reflected in the Order of Predication**

<b>Demonstration</b>	<b>Order of Predication</b>	<b>Example: “S is P because M.” (S = wall)</b>
<i>propter quid</i>	<i>a priori</i>  (reasoning from cause M to effect P)	“The wall does not breathe because it does not have lungs.”  P = not breathing M (proper) = not having lungs
<i>quia</i>	<i>a priori</i>  (“negative proof through a remote cause in the order of predication is <i>a priori</i> but not <i>propter quid</i> ” <sup>140</sup> )	“The wall does not breathe because it is not alive.”  ( <i>demonstratio quia</i> because “many living things do not breathe” <sup>141</sup> )  P = not breathing M (remote) = not living
<i>quia</i>	<i>a posteriori</i>  (reasoning from effect M to cause P)	“The wall does not have lungs because it does not breathe.”  P = not having lungs M (effect) = not breathing

<sup>139</sup> My table is modeled on Owen Bennett, O.M.C., *The Nature of Demonstrative Proof, According to the Principles of Aristotle and St. Thomas Aquinas* (Washington, D.C.: Catholic University of America Press, 1943), p. 37 and Wallace, *Modeling of Nature*, pp. 294-295. Cf. Melvin A. Glutz, C.P., *The Manner of Demonstrating in Natural Philosophy. A Dissertation Submitted to the Pontifical Faculty of Philosophy of the Studium Generale of St. Thomas Aquinas in Partial fulfillment of the Requirements for the Degree of Doctor of Philosophy* (River Forest, Illinois: 1956).

<sup>140</sup> Bennett, *Nature of Demonstrative Proof*, p. 37.

<sup>141</sup> Wallace, *Modeling of Nature*, p. 295.

### 3. The Three Stages of Scientific Inquiry: Abduction, Deduction, Retroduction

Note that when I speak of science as “certain” in the Aristotelian sense, I am referring to *the order of predication* involved in the demonstration. In other words, I speak of the *real relation of cause and effect with regard to the subject matter of the demonstration*. In one sense (the usual English sense of “certain”), all demonstration is “certain” (*per scientialem syllogismum*) when in syllogistic form, because it “cannot be otherwise” (*non est contingere hoc aliter se habere*). But when we speak of Aristotelian science as “certain,” this formal, logical sense of “certain” (*per scientialem syllogismum*) is not the meaning we should have in mind. This is because that formal, logical sense (*per scientialem syllogismum*) is the sense indicated by the third stipulation *demonstrative* (i.e., “cannot be otherwise”) in Aristotle’s definition of science, which is meant to express the character of the *conclusions* in a demonstration as more certain *quoad se* and the premises as more certain *quoad nos*. Rather, the sense here of the first stipulation, *certain* (*scire simpliciter*), indicates the real, factual relation between the terms of the propositions in the demonstration: *quoniam illius causa est propter quam res est*; i.e., ordering what in fact is cause, and what in fact is effect, with regard to the subject. In other words, *a cause is more certain than an effect, and a proper cause is more certain than a remote cause*. Therefore, a demonstration will be more certain (really speaking, and not simply logically) when the principle employed in the middle term M is a *proper cause* and neither a *remote cause* nor an *effect*.

Whether something is a cause or effect of a subject can, of course, only be observed from sense experience and made known through dialectic and induction.<sup>142</sup> Concepts are then subordinated to one another in scientific demonstrations when they are cast in terms of the *certainty* of the order of predication, which is determined by whether the principle used in the demonstration is a cause or an effect. The common caricature of Aristotle is that his science is obsolete because he mostly reasoned *a priori* (“deductively”) and not according to experimentation and sense data (“inductively” and *a posteriori*), and that Galileo initiated true scientific progress because he did the reverse, starting not from suspect “first principles” but from experimentation. But this is a gross misunderstanding of Aristotelian methodology. It is not my task here to show it, but in fact Galileo’s innovations were made possible by the Aristotelian tradition that reflected profoundly upon the *Posterior Analytics*.<sup>143</sup> Galileo learned the

<sup>142</sup> Aristotle, *An. Post.* II. 19.

<sup>143</sup> Cf. William A. Wallace, O.P., *Galileo's Early Notebooks: The Physical Questions. A Translation from the Latin, with Historical and Paleographical Commentary* (Notre

“demonstrative regress” (*regressus demonstrativus*) from this tradition: the art of discovery by which an *a posteriori* demonstration *quia* is convertible to a *propter quid* demonstration. If an effect is “not convertible with the cause,” the *a posteriori* demonstration “yields knowledge of the existence of the cause and some of its conditions.”<sup>144</sup> However, “if the cause and effect are of commensurate universality,” then a proper cause has been discovered and the terms M and P may be switched “without circularity,” i.e., the demonstration may be “recast as a *propter quid* demonstration.”<sup>145</sup>

For example, in Table 1, the cause is “not having lungs” and the effect is “not breathing” and therefore the demonstration is *propter quid* or *quia* depending on whether or not “not having lungs” is taken as the principle M of the demonstration or as the predicate P (i.e., *propter quid* if the former; *quia* if the latter). It is no mere logical game whether or not “not having lungs” is made the principle M or not. It is not a mere tautology to say, “Not having lungs is not breathing,” or to say, “Not breathing is not having lungs,” although it appears that way to someone not acquainted with the subject matter of the science. Someone not familiar with the matter of the science will be mostly indifferent to the order of predication in the demonstration, and to what is or is not a principle, because they are not sufficiently familiar with all the observations and dialectical inductions made. They will think that demonstration is a mere game of transposing circular definitions. However, the scientist will know the difference between cause and effect. The scientist will know by experience whether the principle of the demonstration should be “having lungs” or “having breath,” because he will know the difference

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Dame, Indiana: University of Notre Dame Press, 1977); “The Philosophical Setting of Medieval Science,” in *Prelude to Galileo: Essays on Medieval and Sixteenth-Century Sources of Galileo's Thought*. Boston Studies in the Philosophy of Science, vol. 62 (Dordrecht-Boston: D. Reidel Publishing Company, 1981), pp. 3-28; “Aristotle and Galileo: The Uses of *Hypothesis* (*Suppositio*) in Scientific Reasoning” in D.J. O’Meara (ed.), *Studies in Aristotle. Studies in Philosophy and History of Philosophy* 9 (Washington, D.C.: Catholic University of America Press, 1981), 44-77; “Galileo and Aristotle in the *Dialogo*,” *Angelicum* 60 (1983): 311-332; *Galileo and His Sources. The Heritage of the Collegio Romano in Galileo's Science* (Princeton, New Jersey: Princeton University Press, 1984); *Galileo's Logic of Discovery and Proof: The Background, Content, and Use of His Appropriated Treatises on Aristotle's Posterior Analytics*. Boston Studies in the Philosophy of Science, vol. 137 (Dordrecht: Kluwer Academic Publishers, 1992); and *Galileo's Logical Treatises, A Translation, with Notes and Commentary, of His Appropriated Latin Questions on Aristotle's Posterior Analytics*. Boston Studies in the Philosophy of Science, vol. 138 (Dordrecht: Kluwer Academic Publishers, 1992).

<sup>144</sup> Wallace, *Modeling of Nature*, p. 295.

<sup>145</sup> *Ibid.*



between cause and effect. In fact, it is the material presence of lungs in a body that causes breath, and therefore “having lungs” must be the principle of all respiratory science. If a wall without lungs is observed to breathe, then the principle will have to be reconsidered, i.e., a new principle will have to be found, since there can no longer be *certain* science founded on this principle.<sup>146</sup> “Having lungs” will no longer be the proper cause for *propter quid* demonstrations about respiration. A proper cause must be the *certain* middle term of any scientific reasoning about cause and effect.

Galileo mastered the art of the demonstrative regress, and was such an innovator because he was such a profound Aristotelian. The demonstrative regress is the conversion of a *quia* demonstration to a *propter quid* demonstration when the cause is observed, through careful and deliberate experimentation and dialectical reasoning, to be convertible with its effect.<sup>147</sup> The first stage of the procedure is the regress from effect to cause: “The cause is materially suspected but not yet recognized formally as the cause;” in the second stage, the intellect goes to work, “testing to see” if the cause is “convertible with the effect,” by “eliminating other possibilities;” in the third and final stage, the progression is made “from the cause, recognized ‘formally’ as the cause, to its proper effects.”<sup>148</sup>

To my mind, in John of St. Thomas, this “demonstrative regress” (upon which Wallace has been our pre-eminent contemporary commentator) is clearly described with the three key distinctions between *abduction* (*ascensus*) from sensible effect to intelligible cause, *deduction* (*sylogismus*) as the work of the discursive intellect, and finally induction or, better, *retroduction* (*descensus*) from intelligible cause to sensible effect. Abduction intuitively abstracts a cause from the sensory data; deduction rationally draws out the consequences of this sense-based intellectual intuition; and then retroduction tests the deduction’s insight against further sense experience in order to strengthen the initial abductive intuition (or to revise it in light of new sensory data).<sup>149</sup>

The examples and details of Galileo’s applications of this Aristotelian methodology do not concern me here. But I should point out why Galileo and

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<sup>146</sup> Note that I am using “breathe” carefully and scientifically, in a univocal sense; any objections to my argument must not make the mistake of using “breathe” in an analogous sense, e.g., “fish breathe (with gills)” or “(porous) fabric breathes.”

<sup>147</sup> *Ibid.*, pp. 300-308.

<sup>148</sup> *Ibid.*, pp. 304-305.

<sup>149</sup> Cf. Deely, *Introducing Semiotic*, p. 73. Cf. also Brother Benignus of Jesus, *Nature, Knowledge and God. An Introduction to Thomistic Philosophy* (Milwaukee: Bruce Publishing Company, 1947), pp. 391-397, on the “sensio-intellectual act” of perceptive judgment.

those who imitated him were so successful: i.e., they cultivated the skill of discovering *proper* causes of things. For while any demonstrative syllogism can be called “certain” simply by virtue of the form of its reasoning, it is *truly certain* when considered in terms of the real, factual description of the relation between cause and effect that it expresses. In other words, science and scientific demonstration are most truly scientific, i.e., *certain* in the proper sense, when proper causes are taken as the principles of *propter quid* demonstrations.

Therefore, science is *certain* because it orders demonstrations according to the order of cause and effect. It does this by taking *proper* causes as the principles of demonstrations, thereby demonstrating *propter quid*, and not through either a remote cause or an effect. This order of predication is what is meant when Aristotelian science refers to its knowledge as being certain. It is *certain* because it is knowledge of *proper* causes.

Demonstration doesn’t impose a deductive formal certainty on the already-acquired inductive results which the ongoing dialectics of experimentation yield. This wrongheaded characterization is the false dichotomy that modern thought on science unthinkingly presents to us. Opposed to this false dichotomy is the threefold Aristotelian-Thomistic description of how demonstration and dialectic work *correlatively* in ongoing experience: the ongoing process of *abduction*, *deduction*, and *retroduction*.<sup>150</sup> In a phrase, these are the three stages of the one “demonstrative regress” (or even, as postmodern consciousness would put it, of the one “spiral of semiosis” that structures all experience).<sup>151</sup>

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<sup>150</sup> Cf. Deely, *Introducing Semiotic*, pp. 71-74.

<sup>151</sup> Cf. Wallace, *Modeling of Nature*, pp. 300-308. Cf. also John Deely, “The Role of Thomas Aquinas in the Development of Semiotic Consciousness,” *Semiotica* 152 (1-4): pp. 75-139.

## **Christian Philosophy, Critical Realism and the Apprehension of Existence: Etienne Gilson's “Knowledge and Existence”**

Michael DeMoor

**Abstract:** Rather than being simply an elaboration in the realm of epistemology of his metaphysical conclusions in the first chapters of *Being and Some Philosophers*, Gilson's chapter on “Knowledge and Existence” is crucial for his life-long attempt to show the possibility of a genuinely Christian philosophy by establishing that Thomas Aquinas in fact already articulated one. It is argued, however, that this crucial effort to explain how it is that we can apprehend the act of existence does not succeed on Gilson's own terms, but requires a revision of his view of the kind of causality proper to the act of existence.

The final chapter of Etienne Gilson's *Being and Some Philosophers* – “Knowledge and Existence” – is a fascinating exploration into a Thomist epistemology that attempts to take seriously Gilson's “rediscovery” of “existence” (*esse*) as the primary theme of St. Thomas' metaphysics. Thus, on the one hand, it can be read as an attempt to apply the metaphysical doctrine discovered in the first five chapters of the book to questions about our knowledge. More specifically, since Gilson's interpretation of *esse* places it beyond essence and therefore beyond quidditative conceptualization, the sixth chapter can be read as showing how being as *esse* can nevertheless be known, given that it is a basic Thomist commitment that being is the first object of the intellect. The conclusion of this effort, as I will discuss, is that *esse* is known via an act of judgment rather than (as with quiddities) by an act of

abstraction. This is the intra-textual context for the chapter. However, there is a much broader horizon within which it must be understood as well. At its broadest, this context is a struggle over the meaning of a Christian philosophy in a post-Christian intellectual world. More particularly, “Knowledge and Existence” needs to be seen as part of Gilson’s contribution to the debate over the possibility of a Thomist “critical realism.” I will begin this paper by briefly outlining this debate and showing how high the stakes were for Gilson. I will then show how – on Gilson’s reckoning at least – the question of critical realism revolves around the problem of the apprehension of existence; precisely the problem addressed in “Knowledge and Existence.” From there I will move on to an analysis of that chapter, tracing a particular problem, in an attempt to see if his conception of the knowledge of existence is adequate and thus whether it can shore up a coherent non-critical realism. I will conclude that it can succeed only given considerations about *esse* that are not discussed in the chapter and which may in fact require an alteration of the conception of *esse* propounded in the first five chapters of the book.

### **Critical Realism and Christian Philosophy**

Perhaps the over-riding task of Gilson’s entire philosophical career was his desire to show that, rather than being a contradiction in terms, an integrally Christian *philosophy* was a real possibility. His strategy was to demonstrate this possibility by showing that there in fact *is* a philosophy that is both genuinely Christian and philosophically coherent, *viz.* that of St. Thomas Aquinas. Since the inference from actuality to possibility is valid, showing this suffices to prove the possibility of such a philosophy.<sup>152</sup> According to this strategy, one of the ways of defending the possibility of Christian philosophy is to defend what one takes to be a truly Christian philosophy against all the various objections leveled against it and thus to show its ongoing viability as a philosophy.

Many neo-Thomists, particularly Msgr. Leon Noel and Cardinal Mercier, sought to show that philosophy of St. Thomas remained viable in the modern world by attempting to demonstrate that Thomas’ realism<sup>153</sup> is compatible with the nearly

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<sup>152</sup> Virtually all of Gilson’s works bear directly on this task, but some more directly or explicitly than others. See, for example: *Christian Philosophy: An Introduction*, tr. Armand Maurer (Toronto, Pontifical Institute for Mediaeval Studies, 1993) and the first two chapters of *The Spirit of Mediaeval Philosophy*, tr. A.H.C. Downes (Notre Dame, University of Notre Dame Press, 1991). In the former, Gilson carefully distinguishes a Christian philosophy from Christian theology, while insisting that the two are dependent upon each other.

<sup>153</sup> It is not easy to define just what “realism” means in this debate. It implies at least two different things: First, a belief in the actual and independent existence of a world of bodies (“external world realism” if you will); second, a belief that human knowledge is somehow in touch with this world and determined by it (“epistemological realism” perhaps). As we will see, an essential part of Thomist realism – which connects primarily with “epistemological realism” –

ubiquitous modern commitment to the methodological primacy of a critique of knowledge. That is, they attempted to formulate a “critical realism” whereby a philosophical starting point along the lines of Descartes’ *cogito* or Kant’s *Critique* would ground a Thomistic account of the world and the various entities therein. For Gilson, this could never be; the only logical result of a critical realism is a dogmatic idealism antithetical to the Christian philosophy of Thomas. Thus, a Christian philosophy must resist the kind of accommodationist posture expressed in critical realism; rather it must boldly begin from its own starting point and its own principles, not that of Descartes or Kant.

In *Thomist Realism and the Critique of Knowledge*, he attempts to show that the project of critical realism is not only unfeasible<sup>154</sup> but incoherent. Any critical philosophy, he argues, begins with concepts; that is (in Thomist terms), with quiddities abstracted from the intelligible being (essence) of a real thing. Thus critical philosophy always begins, not with a real world of existents, but in the purely intelligible world of concepts. Furthermore, this attitude posits this intelligible world as independent of – indeed, prior to – the “real” world of sensibility. The critical *realist* – like Descartes – hopes to move through this intelligible world to an understanding of the world encountered by sense, but this is exactly what Gilson believes cannot, in principle, be done. Rather, this critical method turns the world on its head: “If, as has been seen, intellectual knowledge is abstractive knowledge, the reflexive method undertakes to posit what the understanding retains from reality as the necessary and sufficient cause of what is eliminated during the course of its regressive analysis. Such a method is sophistical and replete with impossibilities of all sorts.”<sup>155</sup> That is, by beginning with an abstracted quiddity, critical realism attempts to account for what is left behind in the act of abstraction – viz. real, sensible existence – in terms of what remains – viz. a concept. But how could one do so, without making over all “reality” in the image of the concept, which is nothing other than idealism? In Jason West’s paraphrase: “Any attempt to begin from concepts within the mind can only hope to end with concepts within the mind.”<sup>156</sup> Since the critical project can only lead from methodological idealism – the positing of the world of concepts as explanatorily

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is that being is the primary object of the intellect; that is, that all acts of thinking are directly and intrinsically related to what is real.

<sup>154</sup> That is, it is not only the case that he argues that it won’t actually happen that anyone could derive Thomist principles from a Cartesian or Kantian starting point, but that this is impossible.

<sup>155</sup> Etienne Gilson, *Thomist Realism and the Critique of Knowledge*, tr. Mark A. Wauck, (San Francisco, Ignatius Press, 1986), p. 213. It should be noted that the original French edition of this book was published in 1939, a decade before the publication of *Being and Some Philosophers*; there is therefore nothing anachronistic about placing his refutation of critical realism in the background of his discussion of judgment in the latter work.

<sup>156</sup> Jason West, “Gilson, Maritain and Garrigou-LaGrange on the Possibility of Critical Realism” *Etudes Maritainiennes/Maritain Studies* 17 (2001), p. 51.

prior to the sensible world – to dogmatic idealism, the realist<sup>157</sup> cannot afford to admit the methodological point but must have a completely different starting point.<sup>158</sup>

This starting point can only be the sensible world. Unlike critical philosophy, Thomist realism must give an account of intellectual knowledge that shows its fundamental continuity with the world of real existents, and thus of *existence* as such. On Gilson's understanding of the Thomist view of reality, a quiddity (or concept) is the intellectual expression of the essence of a thing. Since a thing is composed of both matter and form, the thing's being *qua* essence is caused by what makes the thing actual, viz. the form. The act by which the form makes for an actual thing, is then "the very heart of reality"<sup>159</sup> and this is existence. Thus, the essence and the quiddity by which it is (intellectually) known are "in potency with regard to the existential energy of the form" and so "the act of existence is seen by the realist as the ultimate source of what causes experience."<sup>160</sup> Therefore, if truth is an adequation of understanding to being, and if truth is the aim of knowledge, then it is clear that "a being's act of existence, not its essence, is the ultimate foundation of what we know to be true about it."<sup>161</sup>

For a real world to be known in truth, then, requires that there is more to knowledge than the conceptual apprehension of essences through a quiddity: "In order for man to perceive being with his intellect, an existent must be given to him, an existent perceptible to his sensibility"<sup>162</sup> and this requires an inseparable continuity between sense and the intellect that is ruled out by the starting point of critical philosophy. An inseparable continuity, but this does not imply the identity of sense and intellect by any means. The intellect is still abstractive and knows universals,

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<sup>157</sup> Or at very least this applies to the Thomist realist, who (like all Thomists) believes that intellectual knowledge is abstractive; the crucial premise of Gilson's refutation of critical realism is the commitment to this view of intellectual knowledge. It leaves open the possibility of a critical realism that does not regard such knowledge thus, but that would not be a Thomist realism.

<sup>158</sup> Thus, for Gilson, there are at least two perfectly coherent philosophical positions: Realism and idealism, both of which consistently draw out the implications of their respective principles. Any philosopher is free to choose which principles to begin with, but thereafter is bound to philosophize consistently from them. All that is ruled out in this picture is any mediating position. In "Gilson, Maritain and Garrigou-LaGrange on the Possibility of Critical Realism," Jason West argues that this admission of Gilson's part is a mistake and in fact conflicts with his realist principles. Instead, any realism (critical or otherwise) must include a refutation of idealism, showing that, since realism is true, idealism is impossible. He finds such a case in the philosophy of Garrigou-LaGrange. Unfortunately, I cannot enter this discussion in the present context.

<sup>159</sup> Gilson, *Thomist Realism*, p. 200.

<sup>160</sup> *Ibid.*

<sup>161</sup> *Ibid.*, p. 204.

<sup>162</sup> *Ibid.*

whereas sense knows individuals. What is required is an account of the fact that what sense discovers – an actually existing object – is what is known by the intellect in virtue of its intelligible existence (its essence). This is what makes it necessary to give an account of how the intellect knows this actual being. In other words, if the act of existence is the heart of reality, a realist philosophy must assume that this act is present to (or in) the act of knowing (otherwise knowing would never reach the real) and it can only be so via sensible knowledge: “Here we discover the true realist meaning of the formula: *ens est quod primum cadit in intellectu*. With its first thrust the intellect apprehends what is most profound in its object: the *actus essendi*. But we do not encounter Pure Being in experience; we encounter the being of concrete substances whose sensible qualities affect our senses. Therefore, one could say that existence accompanies all our perceptions.”<sup>163</sup>

That existence is apprehended by the intellect in any truthful knowing is therefore assumed in any coherent realism; *how* this can be accounted for is, however, not easy to see. It cannot be by means of abstraction, since this apprehends only universals and the *actus essendi* is that of a particular substance (since it is the act by which the form makes a particular thing actual). Nor can it be known merely by sense, since the objects of sense are sensible qualities and existence is certainly not that. That is: “the apprehension of existence belongs in the class of apprehensions of the singular, [therefore] we must also seek to determine how the apprehension of existence differs from other members of this class.”<sup>164</sup> As we will see in the next section, this is the task of a philosophy of judgment and thus what is undertaken in “Knowledge and Existence.” What I have tried to show thus far, is that the question of the apprehension of existence is absolutely central to the task of formulating a coherent realist alternative to the idealist project of critical philosophy and thereby to helping to establish the possibility of an independent Christian philosophy that can boldly assert its own principles without the fatal accommodation to modern critical methodology. A realist philosophy must show how “the existential acts which affect and impregnate the intellect through the senses are raised to the level of consciousness, and [thus how] realist knowledge flows forth from this immediate contact between the known object and the knowing subject.”<sup>165</sup>

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<sup>163</sup> *Ibid.*, p. 205.

<sup>164</sup> *Ibid.*, p. 195. Gilson goes on to argue that the difficulty of this task is part of what has motivated neo-Thomists to take up the critical project: “This difficult undertaking seems to have lead certain realists to become involved in critical philosophy. Thus they made a difficult task impossible, for when a problem concerning being arises, only metaphysics, not the critique, can offer a solution. Now, we have seen that the Cartesio-Thomists seek a critical justification for metaphysics; it therefore becomes necessary for them to explain how it is possible to apprehend existence before knowing what existence is.” (195) This is further evidence of the extent to which the problems raised by critical philosophy and the task of articulating a non-critical realism revolved around the question of existence and its apprehension.

<sup>165</sup> *Ibid.*, p. 206.

### Judgment and the Apprehension of Existence.

The apprehension of existence was a contested matter amongst neo-Thomists. Jacques Maritain attributed it to an intellectual intuition that is expressed in an affirmative judgment of existence and discovered reflexively therein and known under a concept, or else abstracted from sensible things in the same manner as any other common notion.<sup>166</sup> For Gilson this cannot be right. First of all, there can be no concept of existence, since concepts correspond to essences and existence is “beyond essence.”<sup>167</sup> Furthermore, we have intuitions of sensible *things* not their existence as such. To be known by an intuition, the intellect would have to apprehend the existence apart from any phantasm “but that is impossible in the present state of human nature.”<sup>168</sup> Rather, Gilson’s account sees existence as the object of an act of judging.

In this he follows Thomas himself. As Joseph Owens explains, Thomas understood there to be two ways in which a thing presents itself to us: by its nature (or essence) and by its being. There is a corresponding two-fold activity of the intellect: first there is “formation” by which the intellect apprehends the thing by according to its nature or quiddity.<sup>169</sup> Second: the intellect “comprehends the thing’s being by composing an affirmation, because also the being of a thing composed of matter and form, from which it [i.e., the intellect] gets the cognition, consists in a composition of form with matter, or of accident with subject.”<sup>170</sup> In other words, just as the being of a thing is a composition of form and matter, so the apprehension of that being consists in an act of composition. There is then a structural isomorphism between the object and the act by which it is known. This composition, argues Owens, cannot be expressed merely by a noun, or indeed as a noun-phrase: “The cognitional activity in question is the knowledge that something exists. Just ‘knowledge of existence’ or ‘apprehension of existence’ will not do [to name the activity], since the term ‘existence’ taken by itself does not say that anything exists. Here the object has to be

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<sup>166</sup> My very brief summary is derived from a summary of Maritain’s conception of the apprehension of existence found in Joseph Owens: “Aquinas on Knowing Existence” *The Review of Metaphysics* 4 (1976): pp. 671-672.

<sup>167</sup> It is “beyond essence” insofar as it is the act of an essence comprehending the intelligible form of a thing (hence: *actus essendi*). In the 1952 afterword to *Being and Some Philosophers*, Gilson admits that there must be a certain kind of concept of existence, but not a quidditative one. For discussion of this and later developments regarding his view of the concept of existence see: Harry La Plante, “Etienne Gilson and the Concept of Existence” *The Thomist* 28 (1964), pp. 302-337.

<sup>168</sup> Owens, “Aquinas on Knowing Existence,” p. 72.

<sup>169</sup> *Ibid.*, p. 674. Owen’s puts this apprehension into contemporary parlance with the term “concept.”

<sup>170</sup> *Ibid.*, paraphrasing from Aquinas’ Commentary on the *Sentences* of Peter Lombard d. 38, q. 1, a. 3, Solut.



expressed in a proposition, not by a noun alone.”<sup>171</sup> This complex apprehension of a composite object is, then, rightly called “judgment,” though St. Thomas himself does not use the term.

There are a couple of characteristics of Thomas’ conception of judgment that should be noted. First, just as existential judgment must always be expressed in a proposition, so, conversely, predication in a judgment is always at bottom existential. According to Owens: “the [predicative] ‘is’ expresses for him first and foremost the ‘actuality of every form.’ The fact that something either exists or is so and so is in every case an existential actuality of the thing.”<sup>172</sup> We will see that Gilson has a corresponding notion that “existential propositions” underlie predicative propositions. Secondly, the actuality of the form that is the object of judgment is “highly individual and non-repetitive.”<sup>173</sup> Existence is not a universal and is not predicated univocally of each existent, but is particular to the thing in question at a given time. Thus knowledge by judgment is a kind of knowledge of singulars, but of a different order from the bare perception of sensible qualities. Judgment is a genuine act of the intellect rather than just sensation, but it is not simply abstractive. Thus it fulfills Gilson’s requirement – discussed above – that, to understand the apprehension of existence, we need to find a kind of intellectual apprehension of singulars that is not mere sensation.

Gilson’s philosophy of judgment in “Knowledge and Existence” stays largely true to Thomas’ conception as unpacked by Owens; and it is to that chapter that I now turn. I will give a detailed analysis thereof, paying particular attention to a particular problem that needs to be addressed, viz. what is the nature of the connection between existence and judgment in Gilson’s view? Is it representational? Causal? Etc. After I have done so, I will offer what I take to be the only way that Gilson can make the connection intelligible on his own terms, though this will require a change in the kind of causality that he imputes to *esse*.

### **The Knowledge of Existence in “Knowledge and Existence”**

Gilson starts out, like Aquinas, by distinguishing between judgment and conceiving. All knowledge is an act that forms a conception<sup>174</sup> of its object. There are two kinds

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<sup>171</sup> *Ibid.*, 680.

<sup>172</sup> *Ibid.*, p. 681.

<sup>173</sup> *Ibid.*, p. 683.

<sup>174</sup> It is important to distinguish here between a “concept” and a “conception.” The former refers specifically to the formulation of a definition of the nature or quiddity of a thing, whereas the latter is a “looser” term, referring to any act of apprehension or comprehension. La Plante argues that Gilson (particularly in the Appendix to *Being and Some Philosophers*) relies on the distinction between *conceptio* – which “refers to the act of judgment” – and *conceptus* – which “means the intellect’s abstraction of an essence.” The former includes the latter, but is not reducible to it. “Etienne Gilson and the Concept of Existence” pp. 317-318.

of such conception, simple – as in the bare contemplation of a quiddity (knowing what that is) – and complex – as where “our intellect compounds or divides such quiddities.”<sup>175</sup> In the first case, the act of the intellect is called a *concept* and in the second, a *judgment*. We express judgments verbally as *propositions*. Propositions consist of a *subject*, and a *predicate* and the proposition relates these so as to affirm or deny the predicate of the subject. The two terms are verbally joined by a *copula*, which (unlike the subject and predicate) does not designate a concept “but a determinate relation between the two terms.” (190) The copula is a verb, specifically (and significantly) the verb “to be” usually in its present tense: “is.”

This verb can do two things, however. First, it can function as the copula (as in the proposition “snow is white”). Second, it can be used to assert the existence of a subject (as in “snow is”). These uses give rise to two different sorts of propositions: “two term” and “one term.” One term propositions pose a problem for the notion of judgment and propositions as typically understood: how can a one-term proposition be a composition or division of two concepts, since only one is named?

One answer would be to show that one-term propositions are merely disguised two-term propositions. Just as the apparently one term proposition: “Peter runs” can be put as a two term proposition: “Peter is running” (191), so perhaps we could say that “God is” could be made a two term proposition like “God is being.” (191) The problem is, that, though we could conceive the “is” in “Peter is running” to merely be a copula rather than part of the meaning of the supposed predicate “running,” this doesn’t apply to the verb “to be”: “is being” is redundant, since the “is” means the same as “being.” It is not, then a genuinely two term proposition. In a two term proposition, the copula does not have any significance of its own apart from the syntactical function of relating the subject and predicate; in a one-term proposition it does have its own (semantic) significance.

This all confirms the “metaphysical truth that existence is not a predicate” (as was discussed earlier in the book), since “being” can’t be sensibly predicated of a subject as in “God is being.” And this is no surprise, since the terms of a proposition must correspond to concepts, which are concepts *of* quiddities (essences), and existence doesn’t have an essence; it is not a “what;” it is an act, the “primary act of being.” (193) In one-term (or “existential”) propositions, it never loses this “existential connotation, so that it cannot become a copula.” (193)

Thus existential propositions cannot be converted into two-term “predicative” propositions. Can the reverse be done? Brentano tried, but his attempt did not fly. His primary mistake, says Gilson, was to assume that the copula of a two-term proposition “already means existence” (195) rather than merely signifying a relation. The “is” of the copula does not denote the actual existence of either the subject or the predicate. The proposition: “All swans are white” in spite of the actual existence of

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<sup>175</sup> Gilson, *Being and Some Philosophers*, p. 190. Henceforth, references to this text will be in parentheses in the text.

black swans is formally correct; which is to say that “existence is a prerequisite for the truth of any predication, but it does not directly fall under the scope of predication.” (196).

The upshot of the mutual irreducibility of existential and predicative propositions is that the word “is” in a proposition must have its meaning “wholly contained in itself,” (196) since it neither signifies the subject nor the predicate. “Is” thus does not signify a concept, which is the function of a noun. As an alternative, Gilson moves to consider it seriously as a verb, and to do so he turns to the proper custodians of verbs: the grammarians.

Gilson laments, however, that grammarians have largely been under the sway of the “metaphysical substantialism of Aristotle.” (196) He disposes quickly with two early modern grammarians, Lancelot and Bossuet, who tried to wrestle the verb “to be” under a manageable concept. He then turns to modern grammarians for some help. Brunot manages to take verbs out from under Aristotle’s substantializing thumb; where the philosopher analyzed verbs in terms of concepts (where “to depart” means “departure” (199)), Brunot lets verbs stand directly for “action in time and mode” (199). He thus “found himself in complete agreement with Thomas Aquinas.” (199) That is, both of them realized that the function of “is” in existential propositions (i.e., as a verb) is primary and that, contrary to the problem for logicians, the real puzzle is how it came to be used as a copula in predicative judgments.

The answer to that puzzle, says Gilson, cannot be a logical one, but must be metaphysical. This is because logic cannot be concerned with existence or truth but only with formal correctness or validity: “If a judgment aims to be true, it aims beyond purely formal and logical correction, to achieve an adequate expression of actually existing reality.” (200) Therefore, each predicative judgment, to be true rather than merely correct, must presuppose an existential judgment, and this latter judgment is beyond (or “below”) the scope of logic. So the verb “to be” became the copula, since even predicative judgments (which are the province of logic) are aimed at truth and truth is a function of actual existence: “the verb ‘to be’ is used as a copula because all judgments of attribution which are true or intend to be true aim to affirm or deny a certain way of being.” (200) This confirms what we saw earlier as Thomas’ own insistence that the predicative “is” is primarily (or originally) existential.

So, the whole logical problem that the differing use of “is” has in existential and predicative propositions is undermined by the fact that existential propositions do not fall under the scope of logic, but are also presupposed by the use of “is” in predicative propositions, since these too aim at truth and, hence, existence. That is, logic in a sense can’t “catch” the copula, because it comes to the predicative proposition from a realm beyond its domain of competence: the realm of existence and truth, rather than validity. Once again, we can see here that, on Gilson’s view, the starting point of critical philosophy (the realm of validity) cuts it off from its own existential sources,

from those conditions that it cannot itself acknowledge and which nevertheless bear it up.

But questions remain about these existential judgments, which elude logic and underlie predicative propositions: “what remains for the metaphysician to do is to define the conditions for their very possibility.” (202) These conditions are two-fold: that reality actually includes an act of existence that is distinct from essence, and that the mind is yet able to grasp it in thought or speech somehow. And this is Gilson’s big trick, the one I have been anticipating thus far: can he pull off an account of existence that satisfies both these conditions? As I’ve argued, a great deal depends upon the answer, viz. the existence of a philosophically satisfactory realism that is a real alternative to critical idealism.

Gilson is confident that he has already proven that the first condition obtains, by having shown that any metaphysics that tries to do without existence fails. As for the second, it seems dubitable, since it seems that the mind grasps things via an essence (or a representation of some sort at least), and so existence – which is beyond essence and representation – must elude the mind. But, says Gilson, those who argue like that “fail to grasp the cognitive power of judgment.” (202) Existence lies beyond essence and representation, but not beyond intellectual knowledge since it doesn’t lie beyond judgment (as he has shown) and judgment is “the most perfect form of intellectual knowledge, and existence is its proper object.” (202) In this he accords with the Universal Doctor, but this doesn’t explain, nor has he yet explained how it is that judgments can be *about* existence, since they are made of words which stand for concepts and existence can’t be conceptualized. How can something made out of concepts be about something beyond concepts?

But perhaps this is not really such a mystery. Even concepts, says Gilson, pick out something that transcends them and which they cannot contain. A concept corresponds to an essence, but an essence is always the essence of an actually existing thing, and this act of existence is something that the essence cannot contain: “the actual object of a concept always contains more than its abstract definition. What it contains over and above its formal definition is its act of existing.” (202) But Gilson just brings us back to the question here, by continuing: “and because such acts [of existing] transcend both essence and representation, they can be reached only by means of judgment. The proper function of judgment is to say existence, and this is why judgment is a type of cognition distinct from, and superior to, pure and simple abstract conceptualization.” (202) Thus I will hold onto the question as we continue to follow him.

The problem with essentialists, says Gilson, is that they mistake the part for the whole, abstract essences for actually existing things. The role of judgment is to put those abstractions back into reality by saying either *that* they actually do or do not exist (existential judgments) or *how* they actually do or do not exist (predicative judgments). In the case of existential judgments, “my mental act [of judging] exactly

answers the existential act of the known thing. Let us, rather say, that such a judgment intellectually reiterates an actual act of existing.” (203) Is this our answer: that judgments can “contain” existence because the act of judging is the mental version of the act of existing? So in just the same way that existence is the primary act of a form/essence, so judging is the primary act of a concept? If this is right, we have an isomorphism between knowing and being all right (which is very much in keeping with Thomas), but it does not yet explain how the one can be “about” the other. What is the nature of the connection? We’ll keep the question in mind a little longer, but return to Gilson’s story.

Both abstraction – which separates essences from existents – and judgment – which puts them back – are necessary for knowledge. As such, though they are distinct, these two intellectual operations must never be conceived of as being separate: “abstraction and judgment are never separated in the mind because essence and existence are never separated in reality.”<sup>176</sup> (203-4) Thus, even when we simply think something through a concept (via an essence), it is always attached to existence, otherwise that thinking could never amount to knowledge. And this in turn means that being (understood as that which essence and existence together constitute) is always a component of our thinking: “Being accompanies all my representations. But that even is not saying enough, for each and every cognition is a cognition of being... Being, then, is not only the first and primary object of intellectual cognition, it is the cognition into which every other one ultimately resolves.” (205)

Given this understanding of being and knowing, both essentialism and existentialism are wrong in that they both privilege one “aspect” of being and mistake it for the whole. Gilson/Aquinas’ understanding of being and knowing emphasizes their inter-twining, whereas both essentialism and existentialism obsess about the world as it appears on one side or the other. For Gilson, “concepts express the common act of the knower and the known thing. To know a thing is to *be it* in an intellectual way.” (205) This is his version of Aristotle’s doctrine of knowing as the *adequatio rei et intellectus*.<sup>177</sup> So there is no fundamental division between knowing and being as both essentialism and existentialism suggest, “For an intellectual being such as man, thought is not the abstract objectification of existence, nor is existence the ceaseless breaking up of thought. To think is to act, just as to be is to act.” (206) Thus we see how Gilson grounds his epistemological realism – which attempts to

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<sup>176</sup> Gilson is here again in agreement with Owens’ understanding of Thomas. He argues that “nature and existence are always known together” though they are irreducibly distinct, since existence actualizes nature and nature (formally) determines existence. Cf. “Aquinas on Knowing Existence,” pp. 681-2.

<sup>177</sup> This is in fact a very Thomist spin on the formula. By saying that knowing is the thing “in an intellectual way,” Gilson is incorporating an insight that Thomas adds to the account that Aristotle gives in *De Anima*, viz. that the form of the object is received by the mind in the act of knowing *according to the mode of the receiver*.

overcome the critical split between intellect and sense – in a Thomist metaphysics and ontology, which posits no fundamental gap between minds and bodies. Does this answer my question? I indicated above how Gilson takes judging and existing to be isomorphic; what if they're identical? Can this help us explain how judgment hooks onto existence? I'm not sure that it does. An intellect becomes its object formally; their identity is formal. As Gilson himself puts it, knowledge is "the intellectual becoming of an actual existence in an intellectual being." The existence of the object is its own and the act of the essence in the mind (which is the act of judging) is still the mind's own. They remain merely parallel in this sense. Existence is not a form, but the act of a form; thus judging cannot "take on its form" in the way the mind takes on the form of its object in conception. Are they linked by the formal identity of essence and quiddity? That would seem to fall afoul of the essence/existence distinction. Gilson has not yet provided the answer to my guiding question.

Perhaps we shall find the solution in sense perception. This is, he says, "the vital exchange which constantly takes place between existing intellectual souls and actually existing things. It is, in fact, the meeting point of two distinct acts of existing." (207) Gilson distinguishes *thinking* (the bare contemplation of essences, perhaps, as in logic) from *knowing*, which is indivisibly connected to existence by its truth-character. Perception is then essential to knowing by keeping thinking in touch with being: "To perceive is to experience existence, and to say through judgment that such an experience is true is to know existence." (207) We have seen that this connection is essential to a realist philosophy and its methodological denial is the downfall of any critical realism, but does it answer my question? Does judgment hook up with existence through a sensory experience of existence, the latter supplying the supra-conceptual content of the judgment (namely: existence)? Could it be that, though existence cannot be conceived, it can be experienced? I don't see that this helps. Though we can experience acts like kicking or running, these can be conceived. Existence itself cannot be perceived. It is for this reason that recourse to judgment – as an intellectual knowledge of singulars – was required in the first place; and we have thus just come back around to the question again: How does "judgment" explain the apprehension of existence? We shall wait some more.

Essentialism wants experience without existence, and existentialism wants experience without essence. You can't have the former because existence hitches a ride on every essence (as we've seen) and you can't have the latter since it would lack all intelligibility: "no concept there, nor even judgment, but the bare experiencing of an *is* which is not yet a *being*." (208) We don't ever have any experience that isn't simultaneously conceptual and existential: "That is why there are no concepts without judgments nor any judgments without concepts... all that which is conceived as a being is also judged to be an *is*... but the reverse holds true." (209) So my question about experiencing existence might have interpreted him a bit glibly. You don't experience pure existence, it always comes in a package with essence. But then that

doesn't help explain how the act of judging "answers" the act of existence, unless you could say how existence hitches a ride on the communicated essence and gets the judgment going.

Essentialism and existentialism, Gilson says, are based on a mistaken desire for purity; the whatness of a thing totally unmixed with anything that blurs it, or the "thatness" without being diluted by thought. But purism always fails, as "pure art" and "pure music" show. Being means impurity since it is neither pure essence nor pure existence, but their unity. (209)

Gilson concludes by saying something about what this means for philosophy. Philosophy cannot simply be an act of thought (or "assumption" (212)), as with the idealists, because this leaves existence, and hence knowledge, out. It must instead be based on "seeing." That is, philosophy cannot start where critical philosophy does, but must begin with the world as experienced. This "seeing" is not an intellectual intuition, seemingly provided only to a chosen few, but the experience of a real world. This world is *both* intelligible *and* real, the things in it have both existence and essence. We can conceive the essences and make judgments about their real existence; a philosophical realism needs to give an account of both of these acts as well as of their metaphysical grounds. No philosophy could do without an account of the intelligibility of the world or at least the assumption of it; but no realist philosophy could do without grounding that intelligibility in real existence and this requires a satisfactory account of our knowledge of this ground.

I don't believe that Gilson has provided a fully satisfactory account in "Knowledge and Existence." He has indeed – following Thomas – shown that judgment is an intellectual knowledge of singular, structurally isomorphic with the kind of existence of creatures.<sup>178</sup> Yet I have tried to show by repeated questioning that he has not given an adequate characterization of the connection between them. They cannot be merely isomorphic and yet – as I've argued – the connection cannot be one of identity (judging and existing are different acts) nor can it be formal (since existence is the act of a form, not a form itself).

Gilson's metaphors give clarity to the question. He says in more than one place that the act of judging "answers to" the act of existence; elsewhere he says that it "reiterates" the act.<sup>179</sup> These metaphors are very significant: in what sense "answers"? If that simply means that it has a role in knowing isomorphic to that which existence

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<sup>178</sup> That is, both are compositional.

<sup>179</sup> Here is the metaphor again, at a crucial juncture (after discussing sensation as experience of existence): "Intellectual knowledge conceives existence, but the fruit of its conception is not the representation of an essence; it is an act which answers an act. Exactly, it is the act of an operation which answers an act of existing, and such an operation is itself an act because it directly flows from an act of existing. An epistemology in which judgment, not abstraction, reigns supreme is necessarily required by a metaphysics in which 'to be' reigns supreme in the order of actuality." (207-8)

has in being, then I'm not sure the question is answered. If it means a causal connection, then perhaps it does, but that connection would itself have to be explained. If it means that it's "about" existence, then the question is begged. Being a Thomist, Gilson would have to answer the question by appealing to some sort of a cause, since "cause" in this context simply means: "that which accounts for something." What we need is an account of how the act of judgment answers to the act of existence; and the account will be broadly "causal" in this sense. But what sort of a cause?

It does not seem that it could be a material cause. After all, judgments are not made of existence, but are assembled out of various conceptions. Could it be that it is an efficient cause, that a thing's existential act makes a judgment come about in such a manner? It could be, perhaps in a similar manner that a thing's redness causes me to have a certain sensation when I look at it. But this is difficult to maintain at the level of a judgment. For one thing, if judgments came about simply due to the existence of a thing, it would be difficult to explain errors in judgment. Certainly any error in judgment would not be the fault of the judger.<sup>180</sup> Furthermore, there are plenty of things that exist (even in my sensory environment) that I do not make judgments about, or about which I willingly suspend judgment. If existence were an efficient cause of judgments, then it could be called "the act" of judgment, since it would be what makes judgments actual. Clearly this is not the case, judgments are acts in and of themselves, viz. acts of a mind, just as existence is the primary act of a sensible thing. Finally, as Lawrence Dewan points out, for Thomas, "efficient causes are subsisting things, i.e., *things which HAVE esse*;"<sup>181</sup> *esse* itself is not a subsisting thing, but rather that thing's first act and thus it cannot be an efficient cause. Neither could *esse*'s causality be formal for reasons already discussed; *esse* is not a form but the act of a form.<sup>182</sup>

Rather, I propose that, *vis-à-vis* judgment at least, the existential act's causality is final; that is, the act of existence is the end or perfection of the act of judging. All true knowing is, as we've seen an adequation of the mind to the thing. This is in one sense formal; in acts of simple apprehension, the mind becomes formally identical with its object. But it means more than that. It means that reality is the principle and perfection of knowing, it is that toward which knowing strives; reality is what knowing is *made for*, if you will. As judgment's proper object, then, existence plays this role for it; the judgment's perfection is an actually existing thing, and an existential judgment's perfection is thus that very act of existence. Furthermore, the causality of final causes is, in a sense, normative in a way that the other causes are not.

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<sup>180</sup> These considerations factor into Aristotle's insistence that acts of simple apprehension (say of a sensible quality) cannot be false, but rather that only acts of composition can be false.

<sup>181</sup> Lawrence Dewan, "Etienne Gilson and the Actus Essendi" *Etudes Maritainiennes/Maritain Studies* 15 (1999), p. 96.

<sup>182</sup> And it could not have a form, since the act of *that* form would be *real* existence, and, if that act had a form, then *its* act would be *esse* and so on *ad infinitum*.



Thus, as the final cause of an axe is to chop wood, an axe that cannot chop wood is somehow defective, indeed it is hardly an axe at all. Likewise, if the final cause of judgment is existence, then a judgment that does not correspond to a real existence (i.e., a false judgment) is defective, it is hardly a real judgment.<sup>183</sup> This gives sense to Gilson's metaphor, which states that the act of judgment "answers to" the act of existence: the latter provides the norm by which the former is measured.

I believe that characterizing the relationship of existence and judgment in terms of finality gives a satisfactory answer to my question, thus effectively giving a coherent understanding of the apprehension of existence and, in turn, providing for the possibility of a realism that can boldly repudiate the critical method. However, it conflicts with the way that Gilson himself understands *esse*'s causality. He only ever discusses *esse* as an *efficient* cause of things: "Actual existence, then, is the efficient cause by which essence in turn is the formal cause which makes an actual existence to be 'such an existence.'" (172) Dewan argues, against this conception, that, for St. Thomas, God is the efficient cause of *esse* through the mediation of a formal cause (which corresponds to a thing's essence).<sup>184</sup> *Esse*, on this view, is more like a final cause of things, since – like all final causes – it is "the effect of all other sorts of causality"<sup>185</sup> and yet first in the order of causes:

He [Thomas] says that the order of ends corresponds to the order of agents, in such a fashion that to the first agent corresponds the ultimate end, and the other ends are proportionate to the other agents. *Esse*, which is the proper effect and the end corresponding to the operation of the first agent must, then, have the role of ultimate end. But the end, though first in intention, is last in the operation, and is the effect of the other causes.<sup>186</sup>

This he argues with regard to the *esse* of things, but something similar may be said about the relation of *esse* and judgment. In intention – that is, as that toward which judgment is directed – *esse* is first, but the perfection of the judgment (i.e., adequation to *esse*) comes about via many other causes: the mind as material cause, a human

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<sup>183</sup> In fact, if Donald Davidson is to be believed, a manifold of false judgments could not even be recognized as judgments at all; they are what they are in virtue of their truth-functions. Similarly, I would argue that a judgment that could in principle not be true of a real existent (say a contradictory one) isn't really a judgment at all or is only a pseudo-judgment (just as fictional things are pseudo-things). Its incapacity to fulfill its end, to answer to a genuine act of existence, "denatures" it, if you will.

<sup>184</sup> "Gilson and the Actus Essendi," p. 94. He quotes Thomas from *De veritate*: "God causes in us natural *esse* by creation, WITHOUT THE MEDIATION OF ANY EFFICIENT CAUSE [caps, L.D.], but nevertheless through the mediation of a formal cause: because natural form is the principle of natural *esse*..."

<sup>185</sup> *Ibid.*, p. 95.

<sup>186</sup> *Ibid.*

agent (or perhaps a phantasm) as efficient cause; and the essence of the object in question as formal cause. If Dewan is right – and it corresponds to what I take to be the only way of accounting for the relation between judgment and *esse* – then Gilson needs to reformulate the kind of causality that he accords to *esse*. Dewan does not suggest, and neither do I, that this is an insuperable obstacle for Gilson, but it would require some work. Unless that work is done, then it cannot be concluded that Gilson has succeeded in demonstrating that there is a philosophically coherent realism that does not need to take the critical turn.

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