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A critique of physicalist interpretation of human intellect. Aristotelian and Thomistic approach

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Abstrakt

The dissertation focuses on the arguments for the non-physical nature of the intellect through the works of Aristotle and Aquinas. The goal of this work is to show that the methods, concepts, and distinctions used in Aristotle's and Aquinas' arguments continue to be a solid foundation for the understanding of the intellect and its acts. Selected arguments for the immateriality of the intellect by contemporary philosophers, and analysis of the role of the observer in quantum phenomena, demonstrate how Aristotle's and Aquinas' ideas continue to be used in present-day arguments for the non-physical nature of the human intellect and thus confirm the enduring value of their insights. I suggest that, in contrast to physicalist interpretations of the human mind, Aristotle's method of inquiry, augmented by Aquinas, is more suitable to study a human being in his entirety and especially the human intellect. The approach comprises a detailed interpretation and discussion within the system of Aristotle's and Aquinas' primary works in translation, as well as selected works of contemporary scholars. The bibliography includes 26 primary references and a further 42 secondary sources.

Słowa kluczowe:

a) **imienne:** Aristotle, Aquinas, S. M. Barr, M. J. Dodds, E. Feser, H. Halvorson, M. Heller, S. Judycki, J. Vijgen
b) **rzeczowe:** immaterial intellect, soul substance, observer in quantum theory, naturalism, scientism, Christian naturalism
c) **geograficzne:** Thomistic philosophical anthropology in Europe and USA

TABLE OF CONTENTS

INTRODUCTION

The Question

Who are we? What are we? These questions are not trivial. The answer to them is of paramount importance as it determines our view of ourselves, of our relations with other people, and our attitude towards the natural world and the environment – in short, towards the entirety of the world. As far as we know, only we, human beings, have the capacity to ponder these questions and only we are endowed with the power to answer them. We may laugh or sneer at them or be cynical about them. However, this does not change the fact that it is precisely because we have the power to answer these questions that we are accountable for how we answer them.

This work is the search for who and what I am - for what is my human nature. Am I just a lump of matter, a highly organized and complex one, but just a chunk of matter nonetheless? Or am I something more, something or rather someone whose deepest being transcends the confines of the material universe?

It is this last question that I will address in this work. I will look at it primarily through the eyes of Aristotle and Aquinas. My choice is not random, I have decided on their work because it represents a profound search for the truth about the being of the world, our being, and our place in the world.

Nonetheless, I will not present a typical critical analysis of their main ideas; rather, I will travel with them through their explanations and arguments. The main reason for taking the trouble of such a journey is to accompany them as they discover the truth. Insofar as it is possible to be 'inside' another person's mind, as we travel with them, we 'enter' their minds. We become open to their way of seeing, thinking, and analyzing. We join them in their discovery, not from the 'third person' point of view but in their own view, their own questions, their own struggles, and their own answers. This is both challenging and rewarding - it is a true feast and no small feat. At the same time, I realize that reading my work is, in a sense, reading the 'third person' point of view. And this is the reason I try to stay as close to their presentation as possible. I will summarize and highlight the key points of the arguments, but I think it is truly rewarding to follow their arguments and witness how they unravel the mystery of our human nature.

This work is first and foremost about the nature of the human intellect, simply, because it is the intellect that separates us from what Aquinas calls brute animals and that makes us

rational animals. Since for both Aristotle and for Aquinas intellect is one of the powers of the soul, I'll begin with the explication of Aristotle's concept of the soul, not only to appreciate his development of the concept of the intellect, but also because his insights are sources of inspiration for Aquinas as he clarifies and develops them within the context of Christian thought.

The question of the soul appears under different guises in the history of human thought but ultimately it deals with similar questions. What is life and what does it mean to be alive? What is our ultimate origin? Why is there life at all? Is life the result of God's act of creation, or is it entirely due to chance and survival mechanisms? Are we highly organized machines that happen to be composed of organic matter? Does the physical universe exhaust the meaning of human life, or is there purpose to our life that transcends the physical world?

Although the idea of soul has been discredited as unscientific and practically erased from mainstream academic philosophy, the question of the soul as the principle of life and its meaning has not disappeared but seems to have morphed into two separate problems. The first is the question of life in general and it is primarily discussed by evolutionary sciences, although the ultimate answers are sought in physics. The second problem deals with life as conscious and intelligent. Questions about consciousness, mental states, abstract thought, and reasoning have become the focus of contemporary philosophy of mind.

To the extent that modern science is generally considered to be the only path to true knowledge, the consensus among most philosophers and scientists is that truth about the nature of the human being is to be found through scientific inquiry. The answers about the nature of mind [intellect] are expected to come from the fields of physical sciences and biology, but especially neuroscience.

Can physical sciences provide the exhaustive answer to questions about the being of human being? The fact is that, despite the impressive advances in physical sciences and technology, the questions of human life and the intellect have not been answered by science in any satisfactory manner. It is simply expected that, at some point in the future, modern science will provide the definitive answers to these questions.

In view of this apparent failure, we must ask ourselves if there is only one way to answer these profound questions. Is there only one method of inquiry, namely the scientific method, to investigate all reality, including the being of human beings? This is an important question to ask because our method of inquiry affects the way we study the phenomena and the conclusions we draw from that study.

Perhaps we have been too arrogant and too narrow in our modern approach to the question of life and intellect. Perhaps we need to go back to the beginning of western philosophy and take a closer look at the early philosophers' understanding of the soul. Ancient philosophers were well aware of how difficult it is to explain how the soul is the principle of life - infinitely difficult because it means unlocking the mystery of life. This is why Aristotle, in the first paragraph of *De Anima,* confers on the study of the soul the primary position among all other inquiries.[1]

Even though some of Aristotle's or Aquinas' concepts are considered outdated because they are not directly useful to modern scientific investigation,[2] this does not mean that they do not provide understanding of reality at a deeper level. In fact, Aristotle's or Aquinas' concepts and principles lie at the very foundation of science in the sense that they give reasons for why science is possible. The most obvious example of the depth of Aristotle's philosophy involves the concepts of potentiality and actuality. If modern science can explain the details of the process of change or motion, the concepts of potentiality and actuality answer the question of why any change [motion] is possible at all. In this sense, Aristotle and Aquinas's metaphysical principles provide a deeper understanding not only of the conditions of the possibility of science but of all reality.

I want to emphasize that I do not question the value of modern science and the scientific method. It has proved to be immensely successful in its discoveries about the universe and its practical applications. However, I do question its suitability as the sole approach to the study of human being in his entirety, especially human intellect. My intention is to show the depth of Aristotle's and Aquinas' metaphysical principles as applied to the intellectual operation of understanding.

The Goal

The main goal of my work is to argue for the immateriality of the intellect by emphasizing the immaterial character of intellectual operation. I do so primarily through the arguments of Aristotle and Aquinas, focusing on Aristotle's *De Anima* and Aquinas' *Commentary on Aristotle's De Anima*, *Summa Contra Gentiles*, and *Summa Theologiae*. I

[1] Aristotle, *De Anima*, trans. J. A. Smith, *The Basic Works of Aristotle*, New York, 1941, 402a1-10.
[2] For example, S. M. Barr, a theoretical physicist, is very doubtful that work in contemporary physics would benefit from Aristotle's concept of causality. Also, M. Heller in his book *Sens Życia and Sens Wszechswiata* argues that science does not require certain philosophical assumptions, e.g., the existence of the external world, as it can function perfectly well without them.

point out that there is no conflict between Aquinas' arguments for the immateriality of the intellect and contemporary science. In support, I discuss the problem of the observer that arises from the traditional interpretation of Quantum Mechanics as it has been analyzed by Stephen M. Barr and by Hans Halvorson. I also bring in the thoughts of several philosophers who argue for the immateriality of the intellect [Judycki, Vijgen, Feser]. I suggest that Aristotle's method of inquiry, augmented by Aquinas, is more suitable to study a human being in his entirety, but especially the intellect, than modern science.

The Approach

My primary line of argumentation for the immateriality of the intellect is based on Aristotle's and Aquinas' distinction between the operations of the sensitive and intellective souls, specifically, on the difference between sensitive cognition and intellection, and on Aquinas' distinction between the soul's essence and its powers. I argue that these distinctions are the key to understanding how it is possible for a human being to be a physical being, and yet have an operation that is not physical, thus showing that human being is not a purely physical entity.

The importance of the distinction between sensitive cognition and intellection cannot be overemphasized, first and foremost because it is not reductive. It captures the difference between sensitive knowing [sensation, perception, imagination, sensitive memory, desiring] and intellective knowing [understanding, understanding meaning, judging] without explaining one operation in terms of the other or reducing one operation to the other. But as I argue in Chapter 6, this distinction would not have come to light had it not been for Aristotle's method of inquiry.

The distinction between sensitive cognition and intellection seems to have been mostly abandoned by contemporary philosophy of mind. Phenomena such as sense-perception, imagination, memory, and desiring, as well as understanding, meaning, reasoning and willing are all lumped together under the category of mental events. Although there are attempts to distinguish between sense-perception and intellection, they seem to be inconclusive.[3] The lack

[3] For example, substance dualists, following Descartes, tend to view physical and intellectual realms as two ontologically different substances [not operations]. However, there remains the unsolved issue of bridging the gap between the two ontological realms, and unfortunately this too falls prey to physicalism. For example, David Chalmers coined the so-called "soft and hard problem of consciousness", which is an the attempt to explain the distinction between lower and higher order of mental acts; however, even though his distinction seems at first to be a way to avoid material

of distinction between sensitive cognition and intellection has resulted in the tendency to reduce all mental phenomena, including intellection, to physical phenomena. This reductionism takes places at the level of explanation [e.g., naturalism], the investigation method [e.g., scientism], and ontology [e.g., materialism, scientific materialism, physicalism]. And the tendency to reduce all mental phenomena, but especially intellectual operation, to the purely physical phenomena affects the understanding of the being of human being. Consequently, a human being gets reduced to a physical entity, a highly complicated one, but a physical entity nonetheless. The physicalist interpretations of being of human being have gained power over the past few centuries and, at this point, they appear to be happily embraced by many if not most people in the western world. Interestingly, this is not a typical attitude. Interestingly, Robert Spitzer[4] points out that despite numerous attempts throughout human history to see human being in purely material terms, reductive materialism has not been a predominant or strongly embraced view of the human being. To the contrary, most societies, cultures, and philosophies have always emphasized and appreciated the transcendent aspect of the human being.[5]

My work is an attempt to respond to the present-day tendency to reduce human being to a purely physical entity. Advocates of reductive materialism, physicalism, and scientism assert that human being, including the intellect, can be explained entirely by science. And despite the fact that science has not been able to explain intellectual operations such as the act of understanding, understanding meaning, or reasoning, physicalists firmly hold on to the conviction that only the scientific method will provide a complete understanding of the human mind and, thus, of human being. My contention is that Aristotle's and Aquinas' concepts of the intellect offer a viable answer/alternative to the material reductionism of the human intellect and thus of the being of human being.

I will present some of the history and modern and contemporary reductive approaches to the human person, however, I will not engage in their detailed arguments. Instead, I will present my position and arguments which will be based on Aristotle's and Aquinas' philosophy and supplemented by contemporary examples from science and philosophy. In my approach I am inspired by E. Gilson who, in his work on Thomistic realism, says that once we enter the mindset of idealism it is already too late, that instead of presenting our views we

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reductionism, in the end he also seems to have succumbed to physicalism, albeit of a finer form, as he tries to explain intellect in terms of physics and mathematics.

[4] R. J. Spitzer, S.J., *The Soul's Upward Yearning*, San Francisco, 2015, p. 57.

[5] See R. J. Spitzer, S.J., *The Soul's Upward Yearning* for an extensive discussion of the literature dealing with the transcendent aspect of human beings.

have entered battle that in the end does not give any answers[6]. Similarly, once we enter the territory of physicalism or scientism and their advocates, instead of asserting our position we are caught in the web of their arguments. Being put on the defense we waste energy to argue our position from within their philosophical framework, which is ultimately futile because of different fundamental assumptions.

Order of presentation

In Chapter 1, I present a brief overview of the main reductive approaches to reality in general that influence the interpretation of human being, such as naturalism, materialism, scientific materialism, scientism, and physicalism. I will also discuss two justifications that lie behind these views of reality. The first is the gradual narrowing of the concept of causality which culminates in the principle of the causal closure of the physical. The second is the firm belief that physical science, and especially physics with its quantitative method, is the only path to knowledge.

Chapters 2 and 3 are devoted entirely to my detailed explication of Aristotle's notion of the soul in *De Anima* and the development of the general and specific definition of the soul. My reason for doing so is to highlight Aristotle's method of inquiry. I emphasize his use of the concepts of potentiality and actuality in his analysis of the soul and its activities. I end with his analysis of the difference between sensory knowing and intellection.

In the first part of Chapter 4, I explicate Aquinas' arguments for the immateriality of the intellectual substance based on *Summa Contra Gentiles*, *Summa Theologiae*, and *Commentary on Aristotle's De Anima*. In the second part, I discuss his solution to the question of how immaterial, incorporeal substance can be connected to a physical body, namely, his hylomorphism.

[6] "He who begins as an idealist ends as an idealist," E. Gilson, *Methodical Realism*, San Francisco, 2011, p. 14. "You must either begin as a realist with being, in which case you will have a knowledge of being, or begin as a critical idealist with knowledge, in which case you will never come in contact with being," *idem, Thomist Realism and the Critique of Knowledge*, San Francisco, 1986, p. 149. Gilson addresses the problem of realism vs idealism within the broader context of the appropriate philosophical method, nonetheless, not only do I agree with his insights but also I found his approach appropriate to my work. He also anticipated the detrimental consequence of the emphasis on epistemology in modern philosophy, namely, scientism. Idealism, separated from real objects, inevitably finds its content in science. "Every idealist philosophy of the Cartesian type, because at the outset it identifies the philosophic method with that of a particular science, necessarily ends by emptying philosophy of any content of its own and condemns itself to being a scientism," *idem, Methodical Realism, op. cit.*, p. 22.

Chapter 5 takes us to the present. I discuss several arguments in support of the immaterial nature of the intellect. I begin with Stephen M. Barr's argument about the role of the observer in quantum phenomena. I then suggest that Aristotle's concept of actuality and potentiality is compatible with the epistemological reading of the traditional interpretation of quantum theory. I end with arguments for the immateriality of the intellect by Hans Halvorson, Edward Feser, Jörgen Vijgen, and Stanislaw Judycki.

I conclude my work with Chapter 6. I return briefly to the problem of naturalism and scientism. I discuss Feser's argument against scientism and Michal Heller's argument for a totally different form of naturalism [Christian Naturalism] and his explanation of the proper domain of the scientific method. In the last part, I go back to Aristotle and Aquinas to emphasize several distinctions I consider absolutely crucial to their arguments for the immaterial nature of the intellect, specifically, the distinctions between: 1] potentiality and actuality; 2] intellect and physical body; 3] Aristotle's method of inquiry and the scientific method; 4] the sensitive and intellectual faculties of the soul; and 5] the soul's essence and its powers. I suggest that Aristotle's method of inquiry is more suitable to study the being of the human being, and that Aquinas' distinction between the soul's essence and its powers is the key to explain how the intellectual soul can be both united with the body and have an operation that is not bodily. I emphasize Aristotle's amazing insight about the intellect as no-thing, which explains its being open and capable of knowing all things. I end with some reflections about the importance of proper inquiry into the question of being of human being.

CHAPTER 1
NATURALISM, CAUSALITY

1.1. Naturalism, materialism, scientism

It is unquestionable that modern science has transformed the intellectual landscape of the world, and to the extent that it has dominated the investigation of the universe, it has had enormous influence on the philosophical debate about the nature of reality. In fact, so much so that questions about the ultimate nature of reality have ceased to be metaphysical questions but have become, almost exclusively, questions about the physical realm. It appears that metaphysics has become physics while physics and its methodology have become the new metaphysics. Consequently, *all* reality tends to be viewed as being physical and thus capable of being understood exclusively through the methodology of physical science. The success of modern science, both in theory and its technological applications, is used to justify this reductive approach to reality. It is not an exaggeration to say that the reductive approach to reality has become a daily mantra at most, if not all, public academic institutions and of the secular media. It is quite ironic that August Comte's wish of establishing the Church of Science[7] is finally being fulfilled as modern science and its methodology are becoming enshrined, if not in the Church of Science, unquestionably in the Temple of Scientism. But this fundamental belief in the power of modern science and its methodology has resulted in a constricted view of reality in general and specifically of the intellect.

The narrowed approach to reality finds expression in different forms of naturalism[8], materialism, scientific materialism, physicalism, and scientism. To the extent that they involve claims about the ultimate nature of reality, they are philosophical positions. And to the extent that they share the belief that all reality can be explained in terms of physical sciences, they are reductionistic. The main difference between them is their emphasis and application.[9]

Speaking most generally, naturalism is a philosophical view that "everything that exists is a part of nature and that there is no reality beyond or outside of nature."[10] Its main feature is

[7] L. Kolakowski, *The Alienation of Reason: A History of Positivist Thought*, Garden City, Kindle Edition, 1968. p. 61-63.
[8] J. D. Madden, *Mind, Matter, and Nature, A Thomistic Proposal for the Philosophy of Mind*, Washington D.C., 2013, Ch. 1.
[9] *Ibid.*
[10] S. Goetz and C. Taliaferro, *Naturalism*, Grand Rapids, 2008, loc. 106.

its focus on explanation, but insofar as its claim is that fundamentally there is only one kind of explanation, naturalism is an *explanatory monism*.[11] J. Madden defines naturalism:

> "as the claim that everything in nature that can be explained can be given a physical (or scientific) explanation, and the events, entities, and processes that constitute nature are all that we can reasonably believe to exist."[12]

Nevertheless, it is difficult to define naturalism because it deals with nature and our relationship to it, and thus the question is of how to define nature. As we can see from different views of nature held throughout human history, this is not easy. For example, for Aristotle nature has intrinsic purpose and value. This view is also held by medieval theologians and philosophers. Aquinas sees nature as basically good, and evil as privation of this basic goodness. However, the view of nature as having purpose and being basically good has gradually been replaced by the view of nature as it is understood by modern science,[13] that is, nature ceased to be seen in teleological terms and was instead interpreted in mechanistic terms.[14]

Because of such diverse views of nature, it is difficult to have one definition of naturalism; it is an umbrella term that covers several closely related philosophical positions. But despite many different versions of naturalism, they all have one thing in common, namely, their view of nature is rooted in modern science and the unshaken belief in its explanatory power. According to the most strict definition of naturalism:

> "nature is all that exists and nature itself is whatever will be disclosed by the ideal natural sciences, especially physics."[15]

As we can see, this definition has two obvious assumptions, the first being that, since nature is all there is, there is no such thing as supernatural. Moreover, insofar as anything supernatural or immaterial cannot be proved by modern science, there is no point to even discuss it in any serious manner. Clearly, this assumption or rather claim stems from a

[11] J. D. Madden, *Mind, Matter, and Nature*, *op. cit.*, p 6.
[12] *ibid.*, p. 7.
[13] S. Goetz and C. Taliaferro, *Naturalism*, *op. cit.*, loc. 102.
[14] *Ibid.*, loc. 95.
[15] *Ibid.*, loc. 123.

complete faith that science, and especially physical sciences, will provide the complete understanding of reality, if not now then at least at some point in future.[16]

Most generally, naturalism has two components: ontological and methodological.[17] Ontological naturalism is about the contents of reality. It claims that there is no supernatural or non-physical kind of entity in reality. Methodological naturalism is about methods of investigating reality; however, it claims the sole authority of the scientific method."[18] A quote from The Stanford Encyclopedia of Philosophy nicely encapsulates the most recent version of the program of ontological naturalism:

> "A central thought in ontological naturalism is that all spatiotemporal entities must be identical to or metaphysically constituted by physical entities. Many ontological naturalists thus adopt a physicalist attitude to mental, biological, social, and other such "special" subject matters. They hold that there is *nothing more to the mental, biological and social realms than arrangements of physical entities*."[19]

As the author of this definition explains, the motivation behind ontological naturalism is the desire to explain the causal relation between two metaphysically different events – how special events such as mental events can cause physical events. The goal of ontological naturalism is to provide the solution to this problem by explaining all events in terms of physical events. This may sound like a very sober and well-defined program of inquiry, but it is also self-fulfilling. To the extent that we expect entities that exist in space and time to be physical entities, it makes sense to expect that all such entities, i.e., entities that exist in space and time, to be identical or constituted by physical entities. But to be thorough we could ask what other entities, besides physical entities, exist in space in time?[20]

However, it is not clear what Papineau means by saying that all spatiotemporal entities must also be "metaphysically constituted" by physical entities. Does he mean, for example, that any kind of principle of organization must be physical or be constituted by physical entities? If that is so, the program of ontological naturalism is an outright rejection of even the possibility of considering any explanation that is outside of physical explanation. But the

[16] *Ibid*.
[17] D. Papineau, *Naturalism*, Stanford, 2021, p. 2.
[18] *Ibid.*
[19] *Ibid.*
[20] The question arises as to the nature of information, whether it is a physical entity.

danger of such a program is its lack of openness to any other forms of inquiry, and by default it can easily slip into becoming an ideology.

The hegemony of naturalism is questioned even by its faithful adherents. For example, John Searle, a known philosopher of mind and a naturalist, is quite critical of such a one-sided approach:

> "There is a sense in which materialism is the religion of our time, at least among most of the professional experts in the fields of philosophy, psychology, cognitive science, and other disciplines that study the mind. Like more traditional religions, it is accepted without question and it provides the framework within which other questions can be posed, addressed, and answered."[21]

The strict form of naturalism has problems because it fails to explain our natural understanding of ourselves such as the experience of subjective identity through time, the sense of being the author of my acts, the ability to distinguish which of my actions are freely made and which are coerced, and the sense that I direct my action towards future goals and that they have purpose.[22] To remedy this problem, less strict forms of naturalism have been developed, for example, liberal naturalism, non-scientific naturalism, or pluralistic naturalism. Their goal is to interpret some entities, for example, mental states [e.g., subjective experience of self-identity or qualia] in non-reductive fashion. Still, their explanations seem to be locked within the realm of nature as it is ultimately defined by modern science.[23]

It is hardly surprising that what binds all forms of naturalism is the distaste if not outright hostility towards anything that even smacks of the notion of the supernatural or of God.[24] Kai Nielsen is representative of the attitude of naturalists in the current, philosophical literature:

> "Naturalism denies that there are any spiritual or supernatural realities. There are, that is, no purely mental substances and there are no supernatural realities transcendent to the world or at least we have no good ground for believing that there could be such

[21] A quote from John Searle [*Mind: A Brief Introduction*, 2004], cited in S. Goetz and C. Taliaferro, *Naturalism, op. cit.*, loc. 153-155.
[22] It's an attempt to erase our sense of free will, free choice, and by extension, get rid of Judaism, Christianity, etc. But not only does it question Aquinas' arguments for the freedom of will and choice, it also gets rid of Kant, Kierkegaard, Heidegger, and other philosophers who assert human freedom.
[23] S. Goetz, and C. Taliaferro, *Naturalism, op. cit.*, loc. 140-141.
[24] *Ibid.*, loc. 143.

realities.... It is the view that anything that exists is ultimately composed of physical components."[25]

Nevertheless, there are attempts to interpret naturalism in light that is not hostile to faith in God and religion. Michal Heller,[26] a Polish philosopher, proposes a different version of naturalism, which he terms Christian Naturalism, that provides a well needed counterweight to naturalism's unbridled hatred toward theism. I will discuss his position in the Chapter 6.

Naturalism, which is primarily an explanatory monism, finds its unwavering support in the ontological monism of materialism which claims there is only one fundamental kind of being, namely, matter, and consequently, only the physical is real. Materialism, as a philosophical position, has deep historical roots. It was claimed by Pre-Socratic philosophers, notably materialist philosophers such as Leucippus or Democritus. In modern times materialism has been closely connected with science.[27] Despite the fact that materialism is not science but a philosophical view, it has been embraced by most scientists as well as many lay people as the scientific philosophy. As Stephen M. Barr points out, its popularity and power as the scientific philosophy "is based on certain trends in scientific discovery from the time of Galileo up to the early part of the twentieth century."[28] The main tenet of so-called "scientific materialism" is "that nothing exists except matter, and that everything in the world must therefore be the result of the strict mathematical laws of physics and blind chance."[29] In short, the materialistic view of reality has seized the mind of modern man and has become his default philosophy.

We have finally come to scientism. This view is closely associated with naturalism and materialism. But if naturalism is about explanation and materialism about beings, scientism's focus is on the method of inquiry. Each of these positions is a kind of monism: naturalism is an explanatory monism, materialism is an ontological monism, and scientism is, in a sense, a methodological monism because it views the scientific method as the only path to knowledge or justified belief.[30] And for the faithful adherents to scientism, it is the only true method to know reality.

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[25] A quote from Kai Nielsen [*Naturalism without Foundations*, 1996], cited in S. Goetz and C. Taliaferro, *Naturalism, op. cit.*, loc. 149-151.
[26] M. Heller, *Chrzescijanski Naturalism*, "Roczniki Filozoficzne", 2003, v. LI, p. 41-58.
[27] S. M. Barr, *Modern Physics and Ancient Faith*, Notre Dame, 2003, loc. 154. As a scientist Barr chooses to use the word scientific materialism.
[28] *Ibid*., loc. 162.
[29] *Ibid*., loc. 154.
[30] J. D. Madden, *Mind, Matter, and Nature, op. cit.*, p. 4.

As we can see, naturalism, materialism, scientific materialism, and scientism are simply different expressions of the same desire, namely, to reduce all reality to physical reality and all explanations to physical explanations. This attitude has spread to all areas of inquiry, including those focusing on the human person, as it can be observed by its predominance in philosophy of mind. E. Feser argues that most, if not all, philosophical positions in contemporary philosophy of mind are fundamentally physicalist, including dualistic theories such as substance or property dualism.[31]

I will now turn to a brief discussion of how we have gotten to this narrow view of reality in general and of human being. I must emphasize that the focus of this work is the immaterial nature of the human intellect and not the concept of causality. However, insofar as the gradual narrowing of the notion of causality affects understanding of reality and the human being, I will present a brief overview of this narrowing. This will include a quick summary of the main changes in the notion of causality that have led to the modern view of causality. As we shall see, the reductive approach to human being is the inevitable consequence of the historical changes in the view of causality and finds it ultimate expression in naturalism.

1.2. Causality then and now

At this point I will only mention Aristotle's general notion of causality because much of my explication of Aristotle's and Aquinas' texts is spent on causality in regard to the notion of the soul. As to be expected there is a fundamental difference between Aristotle's and Aquinas' and modern and contemporary notions of causality. For Aristotle and then for Scholastic philosophers causality is intimately connected with having true knowledge – *scientia* is "systematized knowledge so that we can understand the relations between things, especially knowledge through causes, understanding why things are and must be so."[32] Thus, to have true knowledge of a thing is to understand its cause,[33] specifically, it is to know its

[31] E. Feser, *Philosophy of Mind, A Beginner's Guide*, Oxford, 2005. Throughout the entire book, Feser points out metaphysical assumptions of the main positions in philosophy of mind and argues that they are the consequence of scientism.

[32] A. C. Cotter, S.J., *ABC of Scholastic Philosophy*, San Bernadino, 2019, p. 2.

[33] A. Falcon, *Aristotle on Causality*, Stanford, 2019. "In *Posterior Analytics*, Aristotle places the following crucial condition on proper knowledge: we think we have knowledge of a thing only when we have grasped its cause (*APost*. 71 b 9–11. Cf. *APost*. 94 a 20). That proper knowledge is knowledge of the cause is repeated in the *Physics*: we think we do not have knowledge of a thing until we have grasped its why, that is to say, its cause (*Phys*. 194 b 17–20). Since Aristotle obviously conceives of a causal investigation as the search for an answer to the question "why?", and a why-

material, formal, efficient, and final cause. In other words, it is to understand what it is made from, its structure/organization, how it came about, and its ultimate purpose. Aristotle's notion of causality follows from his notion of cause as that from which something proceeds with dependence in being or becoming.[34] Thus, insofar as knowledge of causes leads to knowledge of reality, his notion of causality has both epistemic and metaphysical aspects.

Aristotle's notion of causality is connected to the problem of change[35] – how to explain change. Pre-Socratic philosophers basically failed to explain how change is possible. They either got rid of change altogether [Parmenides] or claimed that everything was in constant flux [Heraclitus].[36] That is, they made either change or continuity impossible. Aristotle's solution is truly ingenious. He is able to explain change and thus causality through the concepts of actuality and potentiality. Most generally, change is actualization of the potential; however, for a potential to be actualized there must be something that can actualize it, and only that which is already actual can actualize it.[37] This is the principle of causality in a nutshell – "If some potential is actualized, there must be something already actual which actualizes it." Another formulation of this principle such as whatever is contingent has a cause or whatever comes into being has a cause are its specific applications.[38]

Aquinas follows and clarifies Aristotle notion of causality; however, by the time we get to the late Scholastics, namely, William of Ockham and Nicholas of Autrecourt,[39] the concept of causality begins to change dramatically. Ockham's view of causality was influenced by Theologiae voluntarism, the idea that God's will is prior to God's intellect, and nothing in nature should put limits on God's will. This, however, implies that universals do not exist because if they did exist and were instantiated in nature, they would limit God's will.[40] For

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question is a request for an explanation, it can be useful to think of a cause as a certain type of explanation."

[34] Excerpt From: M. J. Dodds, *The Philosophy of Nature, Oakland, 2010,* p. 21-23. If a principle "is that from which something proceeds in any way" or, as Aquinas puts it, "a principle implies a certain order in any progression," a cause also implies a dependence.

[35] Aristotle's notion of change includes alteration, growth, local motion, etc.

[36] For an excellent explanation of Aristotle's solution to the problem of change in Pre-Socratic philosophy, see E. Feser, *Aristotle's Revenge,* Neuenkirchen-Seelscheid, 2018, loc. 302 – 453.
Pre-Socratics had two main views on change: 1] for Parmides and his followers, change did not exist – all was being because, given that there is being [things are], and being cannot come from nonbeing/nothing because nothing comes from nothing, hence there is no change; 2] for Heraclitus and his followers, everything was in constant flux, but this view has the problem of explaining permanence and identity of things through time. Aristotle's concept of potentiality and actuality was a solution to Pre-Socratic's quandaries about change.

[37] E. Feser, *Aristotle's Revenge*, *op. cit.*, loc. 694.

[38] *Ibid.*, loc. 696.

[39] E. Feser, *Scholastic Metaphysics*, Piscataway, 2014, loc. 814.

[40] *Ibid.*, loc. 817.

example, if there is a universal human nature and if it is instantiated in an individual human being, then it shapes human behavior. This implies that it is human nature [a universal], and not God's will, that determines, for example, what is good for human being. That is, God's will is limited by a universal. Ockham claims that God does not need to use secondary causes [e.g., human beings, nature] to produce certain effects because he can will them immediately. The problem is that is that it is impossible to know whether the effect was caused by secondary causes [e.g., human being, nature of a thing] or by divine will.[41] This view can lead to skepticism about the necessary causal connections between things because it makes it practically impossible to demonstrate that the effect was produced by a secondary cause and not by divine will. Ockham says:

> "Thus, there is no effect through which it can be proved that anyone is a human being – especially through no effect that is clear to us. For an angel can produce in a body everything that we see in a human being – e.g., eating, drinking, and the like…Therefore, it is not surprising if it is impossible to demonstrate that anything is a cause." (Opera Theologiae V, 72-93, quoted in Adams, 1987, p. 750).[42]

As Feser points out, this view suggests that causes and effects are inherently "loose and separate" – a position that was later propounded by David Hume.[43] Feser continues, "there are in Ockham's voluntarism and anti-essentialism the seeds of doubt about our ability to know objective causal connections."[44]

Aquinas' view is more subtle: he agrees with Ockham that God as the First Cause is the source of all causal powers; however, in sharp contrast to Ockham, he holds that secondary causes have the power to produce effects naturally according to their nature. For example, a human being has the power to produce certain effects by virtue of his human nature.[45] Thus, Aquinas' view does not eliminate divine act, but makes it an extraordinary effect [i.e., miracle].

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[41] *Ibid.*, loc. 828.
[42] *Ibid.*, loc. 828.
[43] *Ibid.*, loc. 831.
[44] *Ibid*.
[45] I would add that Aquinas notion of secondary causes respects God as the primary cause but also the power of creation to act according to its nature, which in case of humans means respect for the dignity of their being, their will and intellect.

Nicholas Autrecourt, a follower of Ockham philosophy (Copleston, 1993, p. 142),[46] expresses an even greater doubt about the necessary connection between cause and effect. According to him, the reason we think there is a necessary connection between cause and effect is that we observed it in the past; however, we can never be certain of this connection in the future.[47]

As we can see, the narrowed notion of causality is already present in late Scholasticism. This trend continues in early modern philosophy in Occasionalism[48], which claims that God is the only causal power - A does not cause B, but it is God that causes B when A is present [on the *occasion* that A is present]. Other philosophers of early modern philosophy[49] continue to struggle with the problem of causality. In a way, their view is the result of Descartes' interpretation of matter as pure extension. If matter is passive and has no intrinsic principle of change or causal power, then the question is how material objects can affect one another. Initially, the answer is provided in terms of laws of nature which at first were seen as God's decrees that imposed order on matter from outside. However, as God is removed from explanation, laws of nature get interpreted in mechanistic terms – they introduce order on matter from outside. And while Aristotle and Aquinas see natural things as having order due to their internal principle of organization that is educed from the potentiality of prime matter, modern philosophers see order in things as imposed from outside.

Nonetheless, at the beginning of the 17th century, ten propositions based on the Scholastic concept of causality were still widely accepted.[50] Feser quotes the following:

"1. There are four kinds of causation: material, efficient, formal, and final.

2. Forms preexist in efficient causes.

3. Causation requires that something is communicated from the cause to the effect.

4. Proper explanations are deductively inferential.

5. Cause and effect are necessarily linked.

6. Causes and effects are substances.

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[46] See E. Feser, *Scholastic Metaphysics*, *op. cit.*, loc. 843.
[47] Marebon, 2009, pp. 49-51, and Weinberg, 1964, pp. 272-75, as cited in *ibid.*, loc. 845.
[48] Ibid., loc. 860. Occasionalism greatly influenced early modern philosophers [e.g., Malebranche].
[49] Ibid., loc. 860 – 872. This includes both those who believed in God, such as Berkeley and Leibniz, and materialists like Hobbes. For Berkeley matter does not exist. Thus he argues that all material objects are ideas, and since ideas are passive, they do not have causal powers. Leibnitz explains the apparent causality of physical objects through the idea of pre-established harmony between them. Hobbes fails to explain causality of physical things because of his concept of matter – if matter is extension/magnitude, how can an atom move another atom?
[50] Ibid., loc. 876, citing K. Clatterbaugh's study of the development of early modern thinking.

7. Some substances are active [self-moving causes].

8. Causation may be instantaneous.

9. Proper explanations are in terms of the true or proper causes of change.

10. God is the total efficient cause of everything."[51]

As we can see, the beginning of the 17th century is still open to the Scholastic concept of causality, but not for long. The developments in modern science in the 17th century fueled a further debate on causation which ended in the elimination of almost all propositions on causality. Proposition #9 survived the cut, however it was eventually changed (Clatterbaugh 1999, as cited by Feser).[52] The final result of the debate was the elimination of all causes, except ones that are identified by empirical science and only those are to be considered as true and proper causes.

Unquestionably, it is David Hume that gives the final blow not only to Scholastic but also to early modern concepts of causality. From then on, the term causation begins to be favored.[53] In *An Enquiry Concerning Human Understanding,* Hume argues against causality as the necessary connection between cause and effect. For him, the reason we believe in causality is that our minds habitually connect two events which, in fact, are 'loose and separate". That is, we observe two events as happening together or as one following another and we assume causal connection between them; in fact, they are two separate events. Hume's famous phrase "constant conjunction of two objects" captures this experience. Hume's view on causality is clearly the logical outcome of his extreme empiricism. Hume's claim that we do not observe causality, but only separate events, is far from innocent. He manages to destroy the notion of necessary causal connection between cause and effect which implies that, in principle, any effect or none might follow from any cause. Whereas Ockham, Autrecourt, and early modern philosophers remove the causality from the world and explain the regularity and order in nature by appeal to God, Hume not only removes causality from

[51] Ibid., loc. 877. Feser adds that Proposition 10 needs qualification and mentions that Clatterbaugh adds that for Scholastics, God was the ultimate source of causal power [the First Cause], however, they did not generally accept occasionalism's view about secondary causes, i.e., they continued to regard secondary causes as true causes.

[52] Ibid., loc. 890.

[53] Scholastics prefer the term causality, while modern philosophy tends to use term causation. It seems that insofar as both of these terms refer to the relation between cause and effect, they are interchangeable; however, there is a difference between them that has to do with what they emphasize. Whereas causality emphasizes the relation between causes and effect [e.g., dependence of effect on cause], causation focuses on the activity. This is probably because modern science accepts efficient and material causation but rejects formal and final causes. .

nature but also removes God from the world. The result is the total skepticism in the possibility of certain knowledge. Nonetheless, Hume's views on causality have become the default position for contemporary accounts of causation. Even though there is no objective reason why Hume's assumptions should be regarded as default ones[54] any debate about causation is expected to take place within the boundaries of Humean epistemic skepticism.[55]

1.3. The impact of modern science on the notion of causality

As we have seen, the notion of causality has gradually narrowed to the point of eliminating the necessary connection between cause and effect. The result is total skepticism in the possibility of certain knowledge. Clearly, the constricted view of causality and by extension of all reality would not have been possible apart from the development of modern science. The reason is that scientific methodology puts restrictions on the notion of causality, specifically, it determines what causes are accepted as having physical effects.

The restriction on the notion of causality has happened alongside scientific developments. The development of mechanistic physics in the 17th century restricts the view of causality because it interprets it in purely mechanistic terms, that is, for a mechanistic philosopher all motion/action is due to one particle hitting another.[56] This observation leads to the conclusion that physical effects can be caused only by physical causes. Newtonian physics of the 17th century is a little less extreme because it allows for a possibility of other causes ["disembodied forces"] and impacts that could cause physical effects.[57] The 19th century continues to be open to the non-physical causes of physical effects, however, the discovery of the law of conservation of energy [kinetic and potential] places new restrictions on causality. According to the conservation law, which is a fundamental law of physics, all forces are governed by deterministic laws. The reason is that unless they are so governed, there is no way of knowing if there are other forces that would cause energy increases. Clearly, this requires that even if a cause were non-physical [e.g., mental], it would have to obey deterministic force laws and be amenable to scientific investigation.

Further restrictions on what qualifies as a cause of a physical effect come from 20th century research in physiology. Unquestionably, the final blow to the notion of the non-

[54] E. Feser, *Scholastic Metaphysics*, *op. cit.*, loc. 913.
[55] Ibid., loc. 909.
[56] Thomas Hobbes epitomizes this approach.
[57] D. Papineau, *Naturalism, op.cit.*, p. 4.

physical cause of the physical effect comes when so-called *causal closure of the physical* [CCP] becomes the rule in the scientific world. What this means is that if a non-physical, mental, or any other 'special' event has a physical effect, it itself must be physically constituted. Consequently, *scientific methodology restricts all causes to physical causes.* It excludes any *sui generis* mental or vital causes, that is, all mental acts and life must be explained entirely in terms of physical causes. We can see how this opens the door to full-fledged physicalism.

This constricted concept of causality did not remain in science, but it has spread to all other areas of inquiry. It has found an especially welcoming home in doctrines of ontological naturalism. For example, the strong physicalist position has powerful impacts on psychology [e.g., behaviorism] as well as philosophy, especially philosophy of mind. CCP is either explicitly argued for or is implied in philosophical positions [Oppenheim and Putnam, 1958]. J. C. Smart [1959] argues for identifying mental with brain states, and Donald Davidson (1970) argues that "since the only laws governing behaviour are those connecting behaviour with physical antecedents, mental events can only be causes of behaviour if they are identical with those physical antecedents."[58]

Although the notion of indeterminacy or chance in quantum mechanics is sometimes used to argue for the existence of non-physical causes, it does not undermine the doctrine of CCP. The reason is that, even though quantum mechanics implies indetermined effects, the effects in quantum mechanics are determined by prior physical circumstances.[59]

It's not difficult to see how CCP supports physicalism. First, it is observed that mental causes [social, biological] have physical effects. Then, the principle of CCP is used to claim that these physical effects *must* have physical causes. Finally, to avoid proliferation of causes for physical effects it is claimed that mental causes that produce physical effects are not ontologically different from physical causes.[60] Clearly, the problem with such arguments is that they all presuppose causal closure of the physical to argue their position. They *a priori* eliminate not only other explanations, but even the possibility of any other explanations. This shows the complete lack of openness to any other type of inquiry; in fact, if anything, this kind of approach smacks of a totalitarian ideology. To the extent that CCP demands that there are *no* non-physical causes of physical effects, this approach is especially liked by hard-core reductive physicalism. Although the views of non-reductive materialists are less extreme, as

[58] *Ibid.*, p. 5.
[59] *Ibid.*, p. 5.
[60] *Ibid.*, p. 8.

they hope to save so called 'special' events [non-physical], their approach is ultimately physicalist.

1.4. The impact of modern science on interpretation of reality

The hypothetical-deductive method of modern science has its roots in the philosophies of the Pre-Socratics and Aristotle, but it was Galileo's procedure of investigation that helped it develop into a full-fledged research methodology.[61] The scientific method consists of four main steps: observation, hypothesis, deduction/prediction, and verification. Although it may seem straightforward, it requires extensive knowledge of a subject matter, as well as creativity and imagination to conceive hypotheses and to interpret the results.[62]

The distinctive feature of modern science is its empirical and quantitative character. Its objective is to express all observations, theories, and conclusions in quantitative terms and to empirically verify [falsify] hypotheses and predictions, which is evident in physical sciences, but especially so in physics and quantum mechanics. The strength of the scientific method lies in its ability to express and formalize observations in mathematical terms that can be generally applied, and in its empirical verifiability [falsifiability]. However, because of its quantitative and empirical character modern science is quite limited in its approach to all reality. To the extent that it deals primarily with quantifiable, observable data, and empirically verified [falsified] hypotheses and predictions,[63] its understanding of reality is inevitably contracted. M.J. Dodds[64] argues that a telling example of this contracted view of reality is the narrow understanding of causality in modern science. Mario Bunge[65] identifies seven basic characteristics of modern science that contribute to this narrowing of causality and consequently of the constricted view of reality:

"a] the restriction of causation to natural causation [naturalism];
b] the further restriction of all varieties of natural causality to efficient causation;
c] the endeavor to reduce efficient causes to physical ones [mechanism];

[61] M. J. Dodds, *Unlocking Divine Action*, Washington, D.C., p. 46.
[62] *Ibid*.
[63] *Ibid.*, p. 47.
[64] *Ibid.*, p. 48.
[65] In *ibid*.

d] the requirement of testing causal hypotheses by repeated observations and, whenever possible, through reproduction in controllable experiments;

e] an extreme cautiousness in the assignment of causes and a ceaseless striving towards the minimization of the number of allegedly ultimate natural causes [parsimony];

f] the focus on the search for laws, whether causal or not;

g] the mathematical translation of causal connections."[66]

Thus, in stark contrast to the robust and wide-ranging view of causality [material, formal, final, and efficient] of Aristotle and Aquinas, modern science, though it admits of material causes, celebrates one notion of causality – that of efficient causality. While Aristotle's and Aquinas' concept of causality is capable of addressing the *why* questions, the modern notion focuses only on the *how* questions, that is, on explaining the mechanism of a reaction, an event, or a phenomenon. The former rich notion of causality has been contracted to only one notion of efficient causation that is basically understood as a blind force behind the motion of matter. And this already narrow understanding of causality is restricted even further by Hume's interpretation that eliminates causality from objective reality and makes it but a habit of thought.[67] Still, insofar as science deals with things that are quantifiable, this restricted notion of causality may be acceptable as a methodological strategy for topics that are amenable to analysis purely by empirical means. However, this narrow approach is highly suspect as the only means to understanding all reality.[68] And as scientific knowledge progresses, it is becoming more clear that such a narrowed notion of causality is apparently inadequate to explain many phenomena in nature.[69] For example, the modern notion of causality is not capable of explaining the beginning of the universe, or the directional behavior of matter. It cannot explain life, nor can it account for the organization and complexity of life.[70] And, most importantly, it is at a total loss when it comes to the intellect.

Unfortunately, this contracted notion of causality has not been confined to the domain of scientific investigation but has reverberated through epistemology and thus metaphysics and ontology. As a result, only that which can be observed, quantified, and empirically

[66] Quoted in *ibid.,* p. 48.
[67] *Ibid.,* p. 53.
[68] *Ibid.,* Ch. 2.
[69] *Ibid*. Dodds provides an excellent analysis of the notion of causality beginning with the philosophies of Aristotle and Aquinas, through its unfortunate narrowing by modern science, to the hopeful signs of its expansion again in contemporary science.
[70] *Ibid.*

verified has become not only the exclusive and legitimate subject of scientific inquiry but has also become the primary vision of reality – "The methodological assumptions that science had used for studying the world became ontological assertions about its nature."[71] M J. Dodds gives a succinct summary of this transformation of the view of reality:

> "The reductionistic method that investigated the world by breaking it down into its smallest parts, became reductionism – the philosophical assertion that the most basic parts of the world are also the most real. Parsimony, the practice of introducing as few causes as possible into a scientific explanation, turned into an ontological conviction that there could be no causes in the real world other than those employed by empirical science. The method of quantitative measurement became materialism, the belief that only the material and measurable is real. The practice of studying the world through efficient causality understood as physical force became mechanism, the tenet that the world is fundamentally mechanical and may be understood only through mechanical explanations. The practice of describing the world through mathematically based laws became determinism, the conviction that the laws of science are not merely descriptive but prescriptive and determinative of all that occurs in the world. The methodological assumption that the laws of science apply uniformly throughout the cosmos became a metaphysical assertion that such laws form a closed causal nexus that cannot be violated. The practice of considering only quantifiable material causes in nature turned into naturalism, the metaphysical conviction that the world, precisely as science studies it, is all that is or can exist…The net result was not science but scientism."[72]

In short, by determining what is worthy of inquiry, the constraints of the scientific method impose strict limits on what is to be considered real. Consequently, what is not quantifiable and empirically verifiable currently faces a grim destiny. In its most charitable treatment, it is ignored, but its fate is usually much worse. That which modern science is not able to fit into the straitjacket of its methodology is deemed either meaningless or ends up getting reduced to that which can be observed and quantified, namely material reality.[73] Reductionism, materialism, mechanism, determinism, closed causal nexus, and naturalism

[71] *Ibid.,* p. 50.
[72] *Ibid.*
[73] S. M. Barr, *Modern Physics and Ancient Faith, op. cit.,* p. 1.

have become the buzz words of modern parlance. And while modern science is not capable of shrinking reality *per se*, it has shrunk the view of reality.

1.5. Philosophy of mind – a brief overview

The development of modern science has narrowed the notion of causality to the point of elimination of any non-physical causes. The scientific program finds it fullest expression in the principle of *the causal closure of the physical* and its philosophical articulation in naturalism, materialism, physicalism, and scientism. The constricted view of causality did not remain confined to physical sciences where it properly belongs, but it has spread to all areas of inquiry including those that concern the human person, including psychology, ethics, social science, and philosophy of mind. Insofar as all mental phenomena, including the intellectual act of understanding, are supposed to conform to scientific methodology and thus also obey the principle of CCP, it is no surprise that philosophy of mind has succumbed to physicalism. In *Philosophy of Mind*, E. Feser argues that all theories in philosophy of mind, including dualistic theories, have fallen prey to physicalism.[74]

As I have already stated in the introduction, the main purpose of this work is to discuss Aquinas' arguments for the immaterial nature of the intellectual operation of understanding to show that they offer a viable alternative to the physicalist interpretations of the human being. This work is not a comparative study between philosophy of mind theories and Aristotle's and Aquinas' concept of the intellect. Thus, I will only briefly mention the main approaches of philosophy of mind, but I will not discuss their arguments in any detail.

Aquinas distinguishes between sensitive cognition and intellection and thus allows for the different ontology of the two types of knowing. I argue that Aquinas' distinction between these two kinds of knowing is the key to argue against reductive physicalist views of human being. Philosophy of mind also deals with sensation, perception, imagination, memory, desires, as well as with understanding, understanding of meaning, and interpretation. But while Aquinas makes a clear distinction between sensitive and intellective knowing, philosophers of mind include all of them in the category of the "mental". Even though they do make distinctions between mental states, they treat all conscious states as mental states, which can be misleading regarding their respective ontologies. In other words, whereas sense-

[74] E. Feser, *Philosophy of Mind, A Beginner's Guide*, *op. cit*. p. 173, p. 217, p. 218. In fact, in every chapter Feser points out the metaphysical, typically physicalist assumptions of the main positions in philosophy of mind.

perception belongs to all animals and consciousness belongs to some of them, the intellectual operation of understanding is distinctively human. And while many states of consciousness have already been and, in principle, could be explained physically, the intellectual knowing has not, and if Aquinas is correct, it never will.

Furthermore, even though philosophy of mind is concerned with the nature of the mind, mental states, mental properties, and mental functions, its central issue is the relation of the mind to the body, i.e., the mind-body interaction. The question of the relation between mind and body goes back to ancient Greece, but has become the key issue in philosophy of mind since Descartes' mind-body dualism. And although there are different approaches to the mind-body problem, there is no question that, at present, physicalist and especially reductionistic explanations are favored.[75]

The most general division in philosophy of mind is between dualistic and monistic approaches to the mind-body problem.[76] Dualism asserts that mind and body are distinct and separate from each other. Its two main positions are substance dualism and property dualism. Substance dualism claims that the mind and body are two different and separate substances. Property dualism claims that the mind is comprised of many independent properties. They emerge from the brain but cannot be reduced to it. Clearly, by relying on the notion of emergence, property dualism tries to avoid reductive physicalism.

In contrast to dualism, monism asserts that mind and body are fundamentally of the same kind. The two main monistic approaches are physicalism and idealism. While physicalism claims that only physical entities exist, idealism asserts that only mental substances exist. At present, physicalism holds the predominant position in the philosophy of mind. Its approaches include behaviorism, identity theories, functionalism, non-reductive physicalism, and eliminative materialism.

Behaviorism or logical behaviorism in philosophy was popular in the first half of the 20th century but has fallen out of favor because it could not account for subjective experiences, e.g., pain. The failure to account for internal mental states led to the development of identity theories. Although they adopt the principle of the causal closure of the physical [CCP], they also try to accommodate 'internal' mental states [e.g., subjective experience of

[75] Interestingly, in their arguments for physicalism, philosophers of mind typically rely on examples from neuroscience such as sensation, perception, or imagination. Aquinas would agree that these examples do indeed have physical being since they are educed from the potentiality of matter; however, they are examples of states or acts that are typical of the sensitive cognition, not of intellection.

[76] Philosophy of mind, *New World Encyclopedia,* 2020.

pain, joy, etc.] Most identity theories belong to 'type' or 'token' theories.[77] Most generally, 'type' is a general category of an occurrence and 'token' is a particular instance of type, e.g., a token monkey is a particular monkey that belongs to the type that includes particular ['token'] monkeys. Type identity theories[78] basically claim that for a given type of mental states there is an identical brain state – a mental state M is nothing more than a brain state B, e.g., my desire to have coffee is identical to certain neurons firing in my brain. Token identity theories are more specific in the sense that they argue that the particular occurrence of a mental event is identical with the particular occurrence [tokening] of a brain event. Although identity theories appear to save the notion of mental events, in fact, they change the meaning of mental – mental is physical and mind becomes brain.[79]

Functionalism[80] is yet another form of physicalism. It basically uses the computer as a model for the mind. In this view, mental is defined by its causal relations with other mental states, with sensory inputs and behavioral outputs. A given mental state is defined by the role it has [function] in a system, and the substrate of mental states is irrelevant. The claim is that a functional state can, in principle, be realized in such different substrates as neurons or silicon.

Non-reductive physicalism attempts to avoid reducing mental states to physical by using the notion of supervenience. The basic idea is that mental states supervene on physical but are not reducible to them. Nonetheless, it is a form of dependence of the mental on physical because the claim is that "there can be no change or variation in mental states without there being some change or variation in physical states."[81] Nonetheless, insofar as non-reductive physicalism does not demand explanation of the mental in terms of physical, it can accommodate such subjective experience as qualia.

But the most radical view of the mental is espoused by eliminative materialism because it simply eliminates mental states. It maintains that mental states do not exist and that they are remnants of outmoded forms of thinking. Paul and Patricia Churchland are the main proponents of this view. Eliminative materialists maintain that contemporary science is the ultimate arbiter of what exists.

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[77] The type-token distinction was made by C. S. Pierce – "type physicalism can now be understood to argue that there is an identity between types (any mental type is identical with some physical type), whereas token identity physicalism says that every token mental state/event/property is identical to some brain state/event/property" [Wikipedia, https://en.wikipedia.org/wiki/type_physicalism].

[78] Type identity theories were developed by John Smart [New World Encyclopedia].

[79] It is enough to Google the word mind to see that it has become increasingly identified by the word brain. When the word mind is used it usually means brain.

[80] Functionalism was formulated by H. Putnam and J. Fodor.

[81] Philosophy of mind, *New World Encyclopedia, op. cit.*

Despite a myriad of approaches and arguments in philosophy of mind,[82] not one of them has been able to explain the relation of the mind and body – they remain nothing more than unverified hypotheses. Still, there is a persistent belief that contemporary science must provide the solution. And just as the constricted view of causality has influenced the theories in philosophy of mind, the physicalist view of the mind affects the interpretation of the human being.

Still, despite its predominance in philosophy of mind, many philosophers reject the physicist approach to the mind and turn to the hylomorphic interpretation of human being of Aristotle and Aquinas.[83] At this point, I will also turn to Aristotle and Aquinas. I will begin with Aristotle's development of his concept of the soul and the intellect. This will lead me to Aquinas' arguments for the immaterial character of the intellectual substance and to its connection to the body, that is, to his hylomorphism. Nonetheless, I want to stress that the main topic of this work is not hylomorphism but the immaterial nature of the intellect. Hylomorphism is important simply because, for Aristotle and Aquinas, a physical substance has existence only as a composite, or more precisely a unity of matter and form, as informed matter and, in the case of the human being, as a unity of the soul and physical body.

1.6. A comment

As we have seen, the constricted notion of causality resulted in the principle of the causal closure of the physical and physicalism. Insofar as the notion of the soul or, in fact, any non-physical cause cannot be explained in terms of physical cause and thus does not fit the scientific program, the idea of soul and of immaterial powers of the soul such as the intellect have been eliminated from most debates on human nature.

Thus, I want to pose a question – how can we explain apparently non-physical effects of our thinking such as abstract ideas? It is generally agreed that abstract ideas [mathematical entities] are non-physical. How do we explain their existence?

The principle of causal closure of the physical says that physical effects must have physical causes. But how do we explain causes of non-physical effects? If we apply the principle of CCP, there is no way to explain scientifically the causes of non-physical effects. Science is silent about them. However, if physical effects must have physical causes, is it possible that non-physical effects have non-physical causes? In that case, an abstract idea,

[82] For a thorough reference on philosophy of mind see D. Chalmer's Guide to the Philosophy of Mind.
[83] For example, Feser, Madden, Dodds, Spitzer.

which is the effect/product of thinking, must have a non-physical cause – the act of thinking – which is made possible by the intellect [non-physical power].

Physicalists would ideally like to show that so-called abstract ideas are in fact physical entities, or 'emerge from physical brains'. Until this happens, however, it makes sense to consider abstract ideas as non-physical entities. But if abstract ideas are non-physical, then the scientific method and its principle of CCP must be silent about them, whether they are effects or causes. But then the question is, can science exist and function without abstract ideas.

This brings us back to Aristotle and the profundity of his insights. We are right back at Aristotle's method of inquiry, according to which the proper object reveals the activity which reveals the power that makes this activity possible. This is also where Aquinas' genius shows us the way. Using Aristotle's method of inquiry, he argues that non-physical effects [ideas] reveal the immaterial operation [understanding] that produces them, which in turn reveals the immaterial power that makes the immaterial operation of thinking and thus immaterial effects possible. This is what I want to show, first by explaining Aristotle's concept of the soul and Aquinas' concept of the intellect, and then by bringing in examples from the interpretation of quantum mechanics theory and from philosophy.

CHAPTER 2
ARISTOTLE ON THE SOUL

Before I delve into Aquinas' argument for the incorporeality of the intellectual principle,[84] I will devote a considerable amount of time to Aristotle's analysis of the soul.[85] Specifically, I will look at Aristotle's critique of prior materialist interpretations of the soul, his definition of the soul as the primary actuality of the body capable of life, and his analysis of the mind and the intellect. I realize this approach will involve a fair amount of explication of Aristotle's text, nonetheless, I consider this necessary in order to truly appreciate any following arguments about the human rational nature, but especially those of Aquinas as his arguments are based on Aristotle's insight about human nature. Thus, not to discuss Aristotle's notion of the soul is to omit not only the profundity of Aristotle's insights, but also to neglect the existential background of the intellectual principle. For both Aristotle and Aquinas, intellectual activity is the unique way life manifests itself in human beings; that is, it is the uniquely human mode of life. However, insofar as a human being is one – the unity of physical body and soul [embodied soul] – in order to appreciate the distinctive character of human intellectual activity it is important to also have some understanding of the fundamental vital activities such as the nutritive and sensitive. Aristotle starts his inquiry about the soul by assessing prior approaches to the question of the soul. His analysis of their approach shows the need for a more comprehensive understanding of the soul as the principle of life, and the definition he presents in Book II of *De Anima* is his answer to that demand. In the following sections I will to a large extent follow his inquiry.

2.1. Introduction to Aristotle's analysis of the question of the soul

2.1.1. The soul according to ancient Greek philosophers

Our universe is sharply divided into two worlds: one of living organisms and the other of non-living things. But how and why is it that there is life? How can we explain life, let alone the intellect? For ancient Greek philosophers, the soul was the answer to the question of life. The soul is that which separates living from non-living things, and therefore it is

[84] Aquinas, *Summa Theologiae, Part I (Prima Pars)*, New York, 1947, Q75, A2.
[85] Aristotle, *De Anima, op. cit.*

considered to be the principle of life. In other words, the soul explains life and thus to understand the soul implies understanding life.[86]

Ancient Greek philosophers held two main views of the soul.[87]As the principle of life the soul is 1) the principle of movement, and 2) the principle of sensing and knowledge. The first view came from the basic observation that living things move, and the soul was seen primarily as the source of motion in living things. However, the further implication, that the soul as the source of motion must itself be in motion, was based on another principle, namely, that the cause of movement must itself be in motion. The second view of the soul was based on the observation that animate things sense and consequently they can obtain knowledge. Thus, in this view the soul is the principle of life because it is the principle of sensing and sense-perception [knowledge]. However, the implication that the soul must consist of the same elements as the rest of the universe stemmed from their epistemic principle, namely, that "like can be known only by the like."[88] Even though there was disagreement as to the nature of these elements, whether they were material [water, air, earth] or immaterial [numbers], the consensus was that if the soul is to know the universe, it must be made up of the same elements as the rest of the universe regardless of what they might be.

Furthermore, all ancient Greek philosophers agreed that the soul as the principle of movement in living things, it must itself be in motion.[89] For example, Democritus and Leucippus believed that the soul is made up of spherical atoms whose constant motion is the cause of movement and thus life,[90] consequently, they believed that knowledge was primarily sense perception.[91] And because the soul, in order to know things, must be composed of the same elements [atoms] as the rest of the universe, the intellect itself must be material.[92]

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[86] The soul has been considered to be the principle of life, not only by Greek philosophers but throughout human history to this day.

[87] Aristotle, *De Anima*, *op. cit.*, Bk. I, 403b24-28.

[88] Ibid., 409b20-30.

[89] Ibid., Bk. I, 403b24-404b7. Even though materialist philosophers such as Democritus and Leucippus focused on the soul as movement, while Pythagoreans and Plato focused more on the soul as the principle of knowledge, all of them believed that the soul is made up of elements [material or numbers] whose motion is the cause of movement in living things, and so of life.

[90] Aquinas, *Commentary on Aristotle's De Anima*, trans. K. Foster and S. Humphries, Notre Dame, 1994, # 34. According to Democritus the first principles of all things are indivisible bodies which he calls atoms. They are infinite in number, have different shapes, and are in constant motion. The soul is composed of spherical atoms because their shape enables them to penetrate everywhere, and their motion has the power to move everything else. Thus the soul consists of particles in motion which by their own movement cause movement in living things.

[91] Aristotle, *De Anima*, *op. cit.*, Bk. I, 404b27-31; Aquinas, *Commentary on Aristotle's De Anima*, *op.cit.*, #39.

[92] Aristotle, *De Anima*, *op. cit.*, Bk.I., 404b8-30; Aquinas, *Commentary on Aristotle's De Anima*, *op. cit*., # 43-52. Aristotle argues that by subscribing to the idea that the soul must consist of elements in

Obviously, there is a striking similarity between ancient Greeks' understanding of the soul and modern and contemporary explanations of the human mind and intellect. Even if their explanations appear unsophisticated from the perspective of contemporary scientific understanding, the principles behind them are quite similar to current interpretations of life and intellect.[93] Just as Democritus is physicalist in his approach to the mind, so too are many contemporary interpretations of mental phenomena. But given the supposed simplicity and so the explanatory force of their explanations, why is not Aristotle satisfied with this purely physicalist approach to the soul as the principle of life?

2.1.2. Aristotle's critique of materialist interpretations of the soul

Aristotle finds materialistic interpretations of the soul unsatisfactory because they fail to capture the essence of the soul, that is, they fail to explain *how* it is that the soul separates living from non-living things. He points out the problems with the materialistic interpretation, and then presents his definition of the soul which offers a revolutionary understanding to the problem of the principle of life.

But what, according to Aristotle, is wrong with the materialistic interpretation of the soul? Why should the soul not be just a corporal body that is made up of the same physical elements as the rest of the universe? Why and how do these materialistic explanations fail? The full discussion of Aristotle's critique[94] of the prior views of the soul is quite involved and not necessary for the purpose of this work; nevertheless several of his arguments warrant some discussion to allow for better appreciation of his definition of the soul. Aristotle's critique is focused on the two main principles of the prior interpretations. The first principle has to do with motion, namely, that in order for a body to move either itself or be the cause of motion in others, it itself must be in motion, that is, its essence must be self-motion. The second criticism is directed against the idea that similarity of composition between the intellect and the universe is sufficient to explain knowledge.

Aristotle's arguments against the soul as the principle of motion are directed primarily against the idea that motion is essential to the soul, that is, that the essence of the soul is self-movement. He is not against the notion of the soul as the principle of movement, but he is

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motion, be they material or immaterial, Pythagoreans and, unwittingly, even Plato also fell prey to the materialistic interpretation of the soul.

[93] E. Feser, *Philosophy of Mind, op. cit.*, especially p. 49-83.

[94] Aristotle, *De Anima*, *op. cit.*, 403b24-404b7; Aquinas, *Commentary on Aristotle's De Anima*, *op. cit*., Bk. I, Lect. III.

against identifying the soul exclusively with motion, that is, against making self-motion the soul's essence. His criticism can be divided into four main areas.

First, he questions the fundamental principle of motion: whether being in motion or being the cause of motion requires that a thing has to be in motion itself [self-motion]. He mentions his earlier argument for the Prime Unmoved Mover,[95] in which he argues that in order to impart motion it is not necessary for a thing itself to be in motion. Aquinas will later add another argument based on the notion of potency and act.[96]

Second, he offers several specific arguments against the idea that the soul's essence is self-motion. He looks at different kinds of motion and then points out the implications if a given kind of motion indeed belonged to the soul's essence. For example, he makes a distinction between direct motion [*essential*] versus indirect motion [*accidental*]. He then observes that the soul's motion, insofar as it does not involve essential change such as alteration or decrease or increase in size, cannot be direct [essential]. That is, the essence of the soul is not motion.[97] Another example is based on the idea of violence [forced motion]. He argues that if motion belonged to the soul's essence, this implies that the soul could possibly be forced to rest. But this also implies that the soul, whose essence is self-motion, would be forced to be in motion, which of course makes no sense. Therefore, the soul's essence cannot be motion.[98] He offers several more examples, but the most important is one that argues that if the soul is moved at all, its motion must be incidental, and not essential. And "if the if the soul is moved at all, it is moved by the objects of sensation."[99] Aristotle also points out that the soul cannot move itself because it would displace itself from its own essence, unless its movement is incidental.[100] Thus for Aristotle, the soul is the principle of movement in living things; however, the soul is not self-moving, i.e., motion cannot belong to the soul's essence. In his commentary on De Anima, Aquinas will point out that even though Aristotle's specific arguments against the soul's essential motion are not the most forceful,

[95] Aristotle, *Physica*, trans. J. A. Smith, *The Basic Works of Aristotle*, New York, 1941, Bk. VIII.
[96] Aquinas, *Commentary on Aristotle's De Anima*, *op. cit*., # 71. Aquinas' argument is based on the concepts of *act* and *potency*. A thing that produces movement is in act; a thing that is being moved is in potency. But the same thing cannot be in act and potency in the same respect, therefore the thing cannot be a cause of movement and be self-moving at the same time and in the same respect. Thus the soul can be a principle of movement in living things without being self-moving.
[97] Aristotle, *De Anima, op. cit.*, 406a12-22; Aquinas, *Commentary on Aristotle's De Anima*, *op. cit.*, # 75-77.
[98] Aristotle, *De Anima, op. cit.*, 406b5.
[99] *Ibid.*, 406b5-11.
[100] *Ibid.*, 406b11-15; Aquinas, *Commentary on Aristotle's De Anima*, *op. cit*., # 86.

they work as arguments to the extent they draw out logical consequences of the opponent's position.[101]

Third, Aristotle argues that if the soul's essence is reduced to motion, it is then impossible to distinguish between life and motion in general. Life involves motion but life cannot be reduced to motion. If everything in the universe is composed of particles in motion, and if motion alone is sufficient to explain life, the implication is that all things in the universe are alive; this of course would also include inanimate objects such as rocks. The obvious consequence is panpsychism and vitalism.[102] Thus, even if everything that is alive is in motion [motion here includes all change and not just locomotion] this does not mean that everything that is in motion [undergoes change] is alive. Obviously then, to reduce the essence of the soul to motion, that is, to say that something is alive because it is in motion, and, conversely, that whatever is in motion must be alive, is inadequate to explain life. Therefore, motion alone is not sufficient to explain life, and life is not reducible to motion.

Fourth, Aristotle argues that motion is a physical concept. The point is that if all reality is reduced to particles in motion, this view applies also to the intellect and the activity of understanding. However, the question remains whether the essence of the soul, and specifically of the act of understanding, can be reduced to material principles.

Aristotle's second criticism of previous views of the soul also argues against reducing the soul to the principle of knowledge. Neither of the earlier views captures the essence of the soul. In regard to the former, he is primarily against the idea that the soul's essence must be motion. In regard to the latter, he argues against the idea that the soul is made up of elements and against the claim that the similarity of elemental composition between the universe and the soul is a sufficient explanation for knowledge, especially for human intellectual knowledge.[103] Aristotle's arguments, insofar as they deal with the question of knowledge and so of the intellect, are especially relevant to this project. I will mention ones that are the most germane to contemporary debates. The first argument concerns the principle of coordination of the elements. The second one brings up the issue of the difference between living versus

[101] *Ibid.*, # 74.

[102] Some philosophers who subscribe to panpsychism or vitalism do indeed hold the view that everything is the universe has a soul [has some rudimentary form of consciousness] and is alive. Of course, their views have become very sophisticated but ultimately they boil down to the belief that human consciousness is the result of the aggregation of some low form of consciousness [e.g., D. Chalmers]. See R. Spitzer, *The Soul's Upward Yearning*, *op. cit*.

[103] Aristotle's arguments are primarily directed against Empedocles and Plato, however I will focus on Empedocles' notion of the soul.

non-living things. The third argument is against an exclusive focus on the intellect at the expense of other vital activities.

The first argument concerns the problem of understanding the whole things, that is, the problem of coordination of the elements. Aristotle argues that, even if it is assumed that the soul consists of the same elements as the rest of the universe, the similarity of elements is not a sufficient criterion for knowledge. The reason is that the universe is more than the multitude of elements in motion. The elements are organized and arranged into complex wholes. Thus, in order to know the complex arrangements, not only would the soul have to consist of elements but it would also have to include all of their complex arrangements. Therefore, argues Aristotle, in order for the soul to know composite things, there must be some *principle of organization.*[104] Moreover, this principle is necessary because unless we understand things as wholes we do not really know what they are. We know what things are only if we understand how their parts are related to each other. For example, if you look at a cell under a microscope, you cannot tell what kind of cell it is unless you have already studied the types of cells, the organs to which they belong, and the animal from which they come – that is, unless you know the whole thing. Aristotle's point is that, even if the soul can perceive the elements, it will not be able to perceive and understand the wholes unless there is also some principle of co-ordination.[105] Another related issue is that reducing all reality to elements does not explain how it is that a thing is a specific kind of thing, be it a plant, a flower, a lion or a stone. Again, what is missing is a principle of their organization. Aristotle also argues against the idea that a thing is known according to its physical mode, that is, that the image in the soul has the same kind of being as the external thing.[106] [107]

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[104] Aristotle, *De Anima, op. cit.,* 409b19-410a13; Aquinas, *Commentary on Aristotle's De Anima*, *op. cit*., # 178-180.

[105] Aristotle, *De Anima, op. cit.,* 409b19-410a13. "Nothing, therefore, will be gained by the presence of the elements in the soul, unless there be also present there the various formulae of proportion and the various compositions in accordance with them. Each element will indeed know its fellow outside, but there will be no knowledge of bone or man, unless they too are present in the constitution of the soul."

[106] If this idea were taken literally, for example, in order to know a stone there would have to be a physical stone in the soul. What the ancient materialist philosophers mean is that we can know things only because they are composed of the same elements; so for example, we can know water because water enters into the composition of our soul. But what is interesting is that even if their understanding sounds unsophisticated to our modern ears, their basic epistemic principle is very similar to modern scientific approaches, specifically, that of material reductionism in Philosophy of Mind. The terminology and details may differ but the principle is basically the same.

[107] Aquinas, *Commentary on Aristotle's De Anima*, *op. cit*., # 179. Aquinas further comments that early philosophers were right in so far as they thought knowledge happens by assimilation. But they were wrong in thinking that the soul knows corporeal things according to their corporeal mode of being, that is, physical things have to have a physical presence in the soul.

In short, there are two related issues. The first is that being made up of the same elements as the rest of the universe [similarity of elemental composition] is not a sufficient criterion for knowledge of things. To understand a given thing means to understand it as a whole [as a whole thing, a unity], thus what is lacking is a principle of organization that would make it possible to understand things. The second and related problem is the lack of any explanation of the nature of a given thing, that is, what makes it possible for the elements to be organized into a given thing, be it a cat, a dog, a plant, or a stone. Thus, Aristotle's criticism addresses both metaphysical and epistemic questions. He has no doubt that the universe consist of things that have real external existence which the human mind has the capacity to know. Nonetheless, the similarity of elemental composition is not sufficient to explain the intellect's capacity to understand things as wholes nor their identity as specific things.

Furthermore, the similarity of elements does not explain the difference between living and non-living things. In his second main argument Aristotle makes a deceptively simple observation, namely, if everything in the universe is composed of the same elements, then why are the elements in some configurations not alive [fire, air, stone] but in others they are alive [plants, animals]?[108] If the soul is made up of the same elements as everything else, then everything should have souls. And since everything that consist of elements or compounds is a body, all bodies would be alive.[109] This obviously is false – we would not say that the a rock or crystal is alive or a piece of metal is alive because it changes or moves.[110]

Aristotle's third main criticism is directed against interpreting the soul exclusively as the principle of knowledge or movement. Such a view does not take into account all living things. Movement or intelligence are the distinctive characteristics of some but not of all living things; for example, all plants grow and reproduce but not all move, and some animals can sense but lack intelligence.[111]

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[108] Aristotle, *De Anima*, *op. cit.*, 411a9-16; Aquinas, *Commentary on Aristotle's De Anima*, *op. cit*., # 193-195.

[109] Aquinas, *Commentary on Aristotle's De Anima*, *op. cit*., # 187.

[110] No matter how complex and intricate are the physical principles and chemical reactions that cause these reactions, life seems more than the growth of a crystal, magnetic attraction of metal, self-propagating chemical or even biochemical reactions. Although just as Thales thought that a magnet was alive because it moves metal, panpsychism and vitalism are again becoming increasingly popular not only in general opinion but also within the academic community. It could be argued that these views resurface especially at times when the understanding of the universe is increasingly physicalist, and yet there is still no satisfying answer to the question of life.

[111] Aristotle, *De Anima*, *op. cit.*, 410b16-22; Aquinas, *Commentary on Aristotle's De Anima*, *op. cit.*, # 189.

To summarize briefly, Aristotle criticizes interpretations of the soul primarily as the principle of motion and as the principle of sensing and knowledge. But first and foremost, Aristotle is against reducing the soul as the principle of life 1] to motion and 2] to elements. The main reason he is against reducing the soul to motion is that, if the soul's essence as the principle of life were in self- motion, there is no distinction between living and non-living things, that is, everything that is in motion [change] would be alive, which obviously is not true. Thus his arguments are directed against the principle that motion [life] has to be always caused by something already in motion, and, specifically against the essential motion of the soul by pointing out the logical consequences of such view.

There are three main reasons for Aristotle's being against reducing the soul to elements.[112] First, a lack of sufficient epistemic and ontological explanation of the wholeness and unity of a given thing, i.e., of substantial being of things. The similarity of elements is not adequate for knowledge of wholes, and being composed of elements does not explain the ontological unity of a given thing. Thus, there needs to be the principle of organization of the elements into whole things. Second, there is a lack of criterion to distinguish living from non-living things. The soul, as that which distinguishes living from non-living things, cannot be made from the same elements as everything else because then everything would have a soul and thus be alive. Third, reducing the soul to the principle of knowledge whose essence consists of elements is insufficient to explain life in its complex vital activities.

2.1.3. Comments

The approach of the ancient materialist philosophers to the questions of life and the intellect bear striking resemblance to contemporary scientific understanding of the universe and of the mind. The soul as the principle of life was identified either with motion, which is the physical phenomenon, or was made up of elements [in motion]. And even if some philosophers claimed these elements had cognitive aspect,[113] they were still tied to physical reality.[114] Similarly, many contemporary philosophers tend to interpret life and the intellect exclusively within the constructs of empirical sciences. Consequently, in both the ancient and modern approaches all reality and, especially, the intellect are effectively reduced to physical reality.

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[112] Aristotle, *De Anima*, *op. cit.*, Bk. I.
[113] For example, Plato claims that the numerical elements that make up the soul are not physical.
[114] Aristotle, *De Anima*, *op. cit.*, Bk. I, 407a2-18. Aristotle argues that even Plato's interpretation of the soul as magnitude is tied to physical reality.

Aristotle argues that the explanations offered by the ancient materialist philosophers, especially their interpretations of the soul as composed of elements in motion, are not satisfactory because they fail to answer key problems. In particular, they do not provide any criterion for distinguishing living from non-living things. Neither do they offer any criterion for knowledge of a given thing as a whole, nor any explanation for substantial being of things – that is, they do not explain what makes things a given thing [a lion, a flower, a stone, etc.]

For example, Democritus claims that everything is made up of the same elements that are put by chance into various fortuitous arrangements, that is, everything in the universe is what it is by 'happy chance.' The similarity to the present day explanation of the universe is striking. Just as chance for Democritus effectively becomes the principle of organization, today chance and probability are at the core of the fundamental explanation of matter[115] and other scientific theories.[116]

However, given the intricacy and complexity of the organization of things, the question is whether chance can indeed be the principle of organization of the universe. For example, as J. Maritain points out,[117] even if we can speak only of the probability of a given chemical reaction taking place, the fact that this probability happens with regularity is what allows for formulation of scientific laws. This, in turn, is possible because the regularity of a given reaction is rooted in the natures of the elements involved. There is always a possibility, a chance, the reaction may not take place because of interfering conditions. Nevertheless, the predictability of reactions or events is founded in the nature or essential properties of the elements. Without this essence, there would be no science because nothing could ever be predicted, including the probability of any reaction taking place.

It could be argued that the essence of a thing, its nature, is itself the result of chance. The problem is that we may never know if that is the case, because all our observations and probability calculations may be already determined by both the nature of things and our observations. For example, even if we cannot tell the exact quantum state of an electron [wave or particle], we know that it will behave in a certain predictable way [as a wave or as particle][118]. Their behavior may be rooted in the nature of matter itself, and it definitely appears to be dependent on the setup of the experiment. Interestingly, the traditional interpretation of quantum theory is inherently probabilistic, that is, it is impossible to have

[115] For example, in the area of quantum mechanics.
[116] For example, random mutations that happen to be beneficial for survival are the core of the modern theory of evolution.
[117] J. Maritain, *The Degrees of Knowledge*, trans. G. B. Phelan, Notre Dame, 1995, p. 30.
[118] This depends on the experimental set up [single or double slit].

exact knowledge of the quantum system in between measurements; however, this conclusion is based on certain observable patterns of behavior. And in agreement with Aristotle and Maritain, the point is that it is impossible to have any understanding and thus science of things, if we believe [like Democritus] that the principle of organization is chance, that is, fortuitous arrangement of elements. The arrangement may be happy indeed, but chance fails to explain it.

Another similarity between the ancient materialist and the modern philosophical approach is that they both hold the same view with respect to the possibility of knowledge, based on the same principle that like knows like. Thus, Democritus and Empedocles claim the soul can know corporeal things because it is made up of the same elements as everything else. This suggests that a thing must be known in the soul according to its physical mode, that is, physical things must have a physical presence in the soul. The image of the thing in the soul [mental image] has the same kind of being as the physical thing, i.e., it is the physical image of the thing. That is, mental image is effectively physical image.

Of course, the modern scientific view is more sophisticated but effectively it boils down to the claim that similarity of elemental composition is necessary for knowledge. Reductive materialism, held by many contemporary philosophers of mind,[119] uses the same basic principle. A mental event is not just correlated with but it is reduced to, and so identical to, the physical event in the brain. The mental event, for example my understanding of what the stone is, is identical with the brain event of a given number of neurons firing. The terminology and explanation may be more sophisticated, but the meaning is the same, namely, a physical thing in the world has physical being in my brain. As explained above, this type of physicalist approach is highly popular today, not only because of the hegemony of the scientific approach, but also because it claims to solve epistemic questions. We can know physical things because, via multiple physical events of sense-perception, they become physical events [neurons firing] in our brains. Whether this is the full answer to the question of our intellectual knowledge of things or only a partial one still remains to be seen.

One of Aristotle's main arguments against interpreting the essence of the soul as consisting of elements is that similarity of elements is not sufficient to explain knowledge of a given thing as a whole. How is it that we know whole things, not just a bunch of elements in

[119] For example, P. & P. Churchlands are staunch representatives of material reductionism and hold that all mental phenomena are reducible and identical to physical events in the brain; see E. Feser, *Philosophy of Mind*, *op. cit.*, loc. 193.

motion? Moreover, how is it that things are organized into whole unified beings?[120] Aristotle's point is that what is lacking is a principle of organization of elements. This in turn bring us to problem of the principle of organization *per se*. To Aristotle's criticism we could add the criticism that the principle of organization could exist either in the thing itself or in the soul. If it exists in the thing itself, then the soul still must have a way to grasp it. Aristotle's and Aquinas' solution is that this principle of organization [the form] exists in the thing itself, and our mind has access to it via abstraction. Whereas early philosophers think the soul receives the physical image of the thing, Aristotle and Aquinas make a distinction between the being of things in reality and being of things in the mind.

But now let us fast-forward 2500 years. We know that on the subatomic level everything indeed consists of particles in motion that are held together by forces. So it would seem that explanations such as those of Democritus or Empedocles work. We also have a much better understanding of how things are organized and science keeps providing new answers. Nonetheless, and this exactly is Aristotle's point, even if all things are composed [on the subatomic level] of the same types of particles, we still do not know *why* these particles are organized into different things, let alone why some are organized into animate and others into inanimate things. Of course, we could say they bump into each other randomly, and the fact that some particles end up as a stone, and others as a lion, is the result of purely random arrangements. But then the question becomes how it is that these random collisions result in well organized, intricate, and repeatable arrangements with definite natures? If we say this is due to their properties, then the question arises why these elements or particles have these particular properties. If we can say they are organized into given things because of their properties, this also implies their organization and so resulting properties are due to an already existing principle of organization. And around and around we go. It is pretty clear that Aristotle's criticism still stands. The similarity of composition between knower and the thing known is not adequate for knowledge. We could know something [elements] but we could not know whole things [a flower, a lion, etc.] Since things exist as whole and separate entities, there must be a principle of organization of things that belongs to the things themselves.

There is, however, also the possibility that the principle of organization exists only in the mind – the route chosen by Kant.[121] In fact, he is the modern success story of this approach. By making the mind the principle of organization of sensory data, Kant offers a

[120] An even more difficult ontological problem is why they are organized into specific kinds of wholes. This is the problem of the function and purpose of things which Aristotle addresses in Bk. II of *De Anima.*

[121] I. Kant, *Critique of Pure Reason*, Cambridge, 1998.

solution that is quite pleasing to modern sensibilities. Through his notions of pure intuition of time and space and categories of understanding, he provides the principle of organization to the randomness of Democritus' particles in motion, and thus is able to confer structure onto random sensory data. By making the mind the exclusive principle of organization of data and so placing the responsibility for the organization of data entirely in the mind, he is able to stick to the raw data which can consist of random particles in motion, and at the same time make knowledge possible. This is truly ingenious. This solution, however, has a metaphysical consequence which goes against Kant's intention. If there are no coordinating principles in reality but only in the mind, the mind becomes not only the creator of knowledge and truth but the ultimate source and arbiter of creation and reality. To Aristotle's question of what gives unity to elements, Kant's answer is the rational human mind. And if the soul is equated with the mind,[122] then one could in principle agree with Kant. But nothing could be further from Aristotle's intention. Aristotle has no doubt about the real existence of the external world, a world that is populated by things with real natures that are independent of the human mind which, nonetheless, can be known by the human intellect.

In short, there is striking similarity between the ancient materialist and modern scientifically inclined philosophers in their approaches to the question of reality and life. When combined with the advances in modern science and technology, this might suggest that the questions about the essence of life and the intellect have been answered. However, the questions about our knowledge of reality, the beginning and essence of life, and especially about the essence of the intellect, continue to be one of the main topics of heated scientific and intellectual debates, and to this day they either remain unsolved or have only partial answers. Just as the interpretations of the ancient materialist philosophers were unsatisfactory, so are perhaps the answers of modern philosophers. Just as their ancient materialist predecessors had faith only in sense-perception, so the modern philosophers are enamored with interpreting life and the intellect entirely within the constructs of empirical sciences, and thus they tend to reduce all reality and, especially, the intellect to physical reality. And just as Aristotle questioned the philosophical attitudes of his predecessors, so should we ask ourselves whether the attitudes of contemporary philosophers, with their tendency towards scientism, offer sufficient answers to the understanding of the human intellect.

[122] Plato and Anaxagoras identified the soul with the principle of knowledge, the mind.

2.2. Aristotle's definition of the soul

Given the prior unsatisfactory solutions to the problem of the soul[123] as the principle of life, in Book II of *De Anima*[124] Aristotle presents his own definition of the soul. The development of his definition is both intricate and fascinating, and at first may seem too involved for the purpose of this work. Nevertheless, I think its explication will not only help to appreciate the key concepts in Aristotle's definition of the soul, but will also provide the foundation for Aquinas' arguments on the soul. Below, I will itemize the key aspects and then give a summary of the main steps in Aristotle's development of the general definition of the soul. I will also spend time on Aristotle's interpretation of the soul in terms of its causality.[125] The reason is that Aristotle's analysis of the soul as the cause of the body is crucial to understanding his concept of the soul as the primary actuality. In Chapter 3, I will focus on the analysis of the sensitive faculty. In Chapter 4, I will turn to the aspects that are especially relevant to the topic of this work, in particular, Aristotle's notion of the mind, the potential and actual intellect, and the question of the immateriality the soul.[126] This will take me directly to Aquinas' concept of the intellectual soul.

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[123] W. Wallace in *The Modeling of Nature* [Washington, D.C., 1996] prefers to use the term natural form because, given our present knowledge, the term soul is not informative enough. This is especially true in relation to both inorganic and organic living things, except in the case of human beings. He decides to use the term mind body for the human soul to make it more compatible with modern terminology; however, he warns that this term is unfortunately loaded with baggage from modern philosophy of mind. I decided to stick with Aristotle's terminology, especially in the explication of his definition of the soul, but make it more palatable to modern readers by explaining its meaning in everyday language.

[124] Aristotle, *De Anima*, *op. cit*., Bk.II. 412a15-412b6.

[125] These definitions refer respectively to the material and formal definitions of the soul; see W. Wallace, *The Elements of Philosophy*, Eugene, 2011, p. 22.

[126] R. McInerny and J. O'Callaghan, *Saint Thomas Aquinas*, Stanford, 2014. McInerny emphasizes the distinction between two notions of immateriality – "'Immaterial' can be said in two ways of forms. In the first way, any form as such is immaterial because it is not a material principle. It is distinguished as a principle of actuality in a being from the material principle which is a principle of potentiality and change in corporeal beings. In that sense, any substantial form whatsoever will be immaterial, including the substantial form of an oak tree or the substantial form of a dog. And so also is the substantial form of the human immaterial in that sense. Aquinas is explicit about this when he proves that the human soul is immaterial in *Summa Theologiae,* Ia.75.5. It is immaterial in just the way in which any form whatsoever is immaterial. But in the second way, 'immaterial' is said of subsistent forms—forms that subsist without matter like angels or spiritual substances in general."

2.2.1. The key aspects of Aristotle's notion of the soul

In his critiques of prior interpretations of the soul, Aristotle argues that the soul cannot be reduced to material elements because this is inadequate to explain 1] the difference between living and non-living things, 2] the unity of a physical thing, 3] the possibility of knowledge of whole things, and 4] the possibility of the different modes of life. But Aristotle's goal is not only to address the unsolved problems but, first and foremost, to provide the most comprehensive definition of the soul as the principle of life. For him, such a definition must include a general definition that is applicable to all living things and a specific definition that accounts for three major modes of life.[127] Thus, he begins his inquiry by first formulating the general definition and then by explaining the details, in a manner similar to the way we typically learn, i.e., we first grasp something in its general aspect and then we try to understand it in greater detail.

According to Aristotle's general definition, the soul is "the first grade of actuality of a natural body having life potentially in it. The body so described is a body which is organized."[128] Thus, the soul is not a form of any natural body but the form of the living body. The *first* key aspect is that the soul is *the first actuality* of the body. And as the first actuality of the body, the soul realizes the potentiality[129] of a body to become a specific living body. This is analogous to a form of any physical thing that actualizes or realizes the potential of matter to become a particular body. But there is a crucial difference between a form of any physical body and the soul. The form of a physical body [natural body] realizes a potential of a body to be a particular physical body; however, the soul realizes the potential of the body [of one that has that potential] to become a living body. The *second* key aspect of the definition is that the *soul is not a body*, which is obvious from the concept of the physical body as the composite of the matter and form. The *third* main aspect is that the soul and body are one, i.e., there is a natural *unity of body and soul*. This is rooted in the notion of the soul as actuality of the body, and as such it is the realization of the potentiality of matter to become a living body. The *fourth* is the notion of the *body potentially alive*. This basically means that not every physical body can be the subject to the act of the soul but only that which has the potency to be realized, that is, has the potentiality to become a living body. The *fifth* main

[127] The three modes of life are: the nutritive, the sensitive, and the intellective.
[128] Aristotle, *De Anima*, *op. cit.*, 412a25-30.
[129] I will use interchangeably the terms 'act' and 'actuality' and also 'potency' and 'potentiality'. A. Smith's translation of *De Anima* uses 'actuality and potentiality', whereas K. Foster's and S. Humphries' translation of Aquinas's *Commentary on De Anima* uses the terms of 'act and potency'.

idea is that *the soul is the cause of the body*: formal, final, and efficient. The soul is the formal cause as the form of the body, i.e., the principle of organization of matter. The soul is the final cause as the principle of organization directed towards self-maintenance, well-being, and fulfillment of the living organism. And the soul is the efficient cause as the principle of motion which is understood not only as the local motion, but more generally as the principle of change, e.g., growth and reproduction. After formulating the general definition, Aristotle develops the specific definition of the soul, which involves an inquiry into the three major modes of life. It explains how the soul is responsible for the way life expresses itself at the lowest level of nourishment, the higher level of sensation, and the highest level of intellectual activity.

For Aristotle the soul is undoubtedly the immaterial principle of the physical body. But it is not immaterial in the sense given to the soul by Plato.[130] The soul is immaterial insofar as it is a form, the primary act, and the principle of organization. But, according to Aristotle, because the soul and body are one composite substance, the soul disintegrates at death. This is definitely true of nutritive and sensitive souls [plants and animals] because of the dependence of their vital activities on the physical body. However, a problem arises for Aristotle with his analysis of the mind and the intellect, a problem due to the apparently immaterial intellectual activities such as understanding and reasoning, and it is quite clear that Aristotle struggles with this problem.[131] He intimates a solution in the concepts of the potential and actual intellect, but he seems to be unable to answer this question in a definite manner.[132] This is where Aquinas steps in and provides an amazing explanation to the problem of the intellectual activity. I will address these problems in Chapter 4.

2.2.2. The main steps in the development of the general definition of the soul

In Book I of *De Anima*, Aristotle argues that it is inadequate to define the soul only as the principle of motion or knowledge. The correct interpretation of the soul must provide 1] the criterion for the fundamental distinction between living and not-living things, 2] the

[130] For Plato, the soul is the form of the body, but it is connected to it only accidentally. The soul is 'imprisoned' in the body during life and gets released upon death. The connection of the soul to the body is not natural to it.
[131] Aristotle, *De Anima*, *op. cit.*, 404a27-31. Aristotle is critical of Democritus for making the soul and the mind identical and thus reducing intellectual activity to sense perception and to matter. This suggests that Aristotle wants to make a distinction between the soul [as responsible for all bodily activities] and the mind.
[132] D. Ross, *Aristotle*, New York, 1995, p. 153-7.

ontological foundation of the substantial unity of things, 3] the epistemic criterion of the knowledge of things in their substantial wholeness, and 4] an account of the three major modes of life, namely nutritive/vegetative, sensitive, and intellective. First of all, it must explain what it is about the soul that separates living from non-living things. It must pinpoint the fundamental distinction between them. How exactly are they different?

Aristotle develops his definition by gradual unfolding of the distinction between living and non-living things. This eventually leads to interpreting the soul in terms of substance as the form or actuality, and then, more precisely, as the first actuality of the organic body potentially alive.

He begins with the general definition of the substance, as that which can be on its own. In contrast to substance, which has independent existence, accidental properties such as heat, cold, whiteness, have no independent existence. Their existence depends on a substance; for example, there is no separate existing whiteness but there is a white flower. Thus having independent existence marks the main difference between the substance and accidental properties.

Next, Aristotle looks at the three possible ways of being a substance, which leads him to define substance as form or actuality. The meaning of substance can be understood in several ways: as matter, as form, or as compound of matter and form.[133] Matter, according to Aristotle, has no definite being of its own but it is a potentiality to become a definite thing. The second meaning of substance is form as that which gives matter its actual being, that is, form is actuality or act – it confers being on matter. It defines matter to be such and such kind of being. Third, the substance can be defined as the compound of matter and form, that is, as informed matter.

He then observes that all physical bodies, including artifacts, are substances as composites of matter and form. However, because all physical bodies are made up of them, natural bodies are substances to an even greater degree. Moreover, some natural bodies are also capable of life which, at a fundamental level, consists of the capacity for nourishment, generation, and decay[134]. What this means is that living things, insofar as they are natural bodies, are also substances as composites of matter and form. In Aristotle's words: "therefore

[133] Aristotle, *De Anima*, *op. cit.*, 412a5-10; Aquinas, *Commentary on Aristotle's De Anima*, *op. cit.*, 215.
[134] Aristotle, *De Anima*, *op. cit.*, 412a11-15; Aquinas, *Commentary on Aristotle's De Anima*, *op. cit.*, 217-219.

every natural body sharing in life will be a substance, and this substance will be in some ways composite."[135]

This last statement bring us to a crucial point, namely Aristotle's claim that, precisely because natural living bodies are composites of body and soul, the body is *not* the same as the soul. The matter is potentiality, the soul is that which actualizes that potentiality. The body is that which is 'acted upon' by the soul. As Aristotle explains, "but since it is also a body of such and such a kind, viz. having vitality, the body cannot be soul; the body is the subject or matter, not what is attributed to it."[136] Or, as Aquinas puts it, "since however, it is a body of such and such nature, i.e., having vitality, the soul will not itself be the body. For the body is not one of the factors existing in the subject; rather it is as the subject and the matter."[137]

Thus far Aristotle has argued that the living body is a substance as the composite of the natural body and the soul. Moreover, because the natural living body is a composite of body and soul, this means the body and soul are not the same. The body is subject or matter that has potentiality to become a living body. But the question is, if the body is not the soul, then what is the soul? Aristotle gives the first general definition of the soul in terms of the substance as form, namely, as the specifying form or actuality of a natural body capable of life. In Aristotle's words: "the soul must be a substance in the sense of the form of a natural body having life potentially within it … but substance is actuality, and thus soul is the actuality of a body as above characterized." [having life].[138] Or, in Aquinas' translation, "it is necessary then that the soul be a substance in the sense of the specifying principle of a physical body potentially alive ... Now substance [in this sense] [as the specifying principle] is act**;** it will therefore be the act of a body of this sort."[139]

The main point is that just as any form specifies matter to become a particular thing, the soul informs matter to become a particular and living thing. A natural living body is this individual living thing that exists as a specific kind of a thing – a cat, a dog, a tree. It is not just a body as matter, but it is defined as this or that particular living body. Thus, Aristotle answers the first problem of the prior materialistic interpretations of the soul. The soul is the principle of life, but not as material elements or even a physical body, but as the actuality or act of that body. It realizes or actualizes the potentiality of that body to be alive. However, the body must have the capability/potentiality to be actualized.

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[135] Aristotle, *De Anima*, *op. cit.*, 412a15.
[136] *Ibid.*, 412a17-20.
[137] Aquinas, *Commentary on Aristotle's De Anima*, *op. cit.*, 412a15-22, # 220-226.
[138] Aristotle, *De Anima*, *op.cit.*, 412a20-22.
[139] Aquinas, *Commentary on Aristotle's De Anima*, *op. cit.*, Bk. II, Lect.1., 412a15-22; # 220-226.

We finally come to Aristotle's general definition of the soul. The soul is defined as actuality of the body. But in what sense is the soul the actuality of the body? What kind of actuality is it? Here Aristotle makes a distinction between several grades of actuality. This distinction is absolutely crucial to the understanding of the soul as the primary actuality. As he says:

> "Now the word actuality has two senses corresponding respectively to the possession of knowledge and the actual exercise of knowledge. It is obvious that the soul is actuality in the first sense, viz. that of knowledge possessed, for both sleeping and waking presuppose the existence of the soul, and of these waking corresponds to actual knowing, sleeping to knowledge possessed but not employed, and in the history of the individual, knowledge comes before its employment or exercise… That is why the soul is the first grade of actuality of a natural body having life potentially in it."[140]

Or, as Aquinas' expresses it:

> "one [i.e., actuality] as is the possession of knowledge; another as is the act of knowing. It is plain that it is like knowledge possessed. For the soul remains in the body whether one is asleep or awake. Being awake is comparable to the act of knowing, sleep to possession without use. Now knowledge possessed is prior in the order of generation, in one and the same thing….The soul, therefore, is the primary act of a physical body capable of life."[141]

Aristotle explains the difference between the two grades of actuality by using an analogy between possessing knowledge and using it: "one like knowledge possessed, the other, like the act of knowing."[142] Possession of knowledge is the primary actuality that makes possible the secondary actuality which is the actual use of that knowledge. For example, one has the knowledge of how to write but may not be writing at any particular moment. The soul is analogous to possession of knowledge and thus it is the primary actuality of the body capable of life. It realizes the potency of the body to become alive. In other

[140] Aristotle, *De Anima*, *op. cit.*, 412a23-29.
[141] Aquinas, *Commentary on Aristotle's De Anima*, *op. cit*., Bk. II, Lect.1., 412a22-28; # 227-229.
[142] Aristotle, *De Anima*, *op. cit.*, 412a6-12; Aquinas, *Commentary on Aristotle's De Anima*, *op. cit*., # 212-216.

words, all vital operations[143] that are necessary for a body to live are made possible [are ready] to be active.

Furthermore, a natural body that is capable of life must also be organic, that is, it must be made up of organs that are not only necessary for the survival, but also contribute to the well-being of an organism. This is true of the simple living things such as bacteria or simple plants. Aristotle's observation that the body capable of life must consist of organs that have definite purpose in the overall functioning of the organism[144] puts into bold relief the fact that not all physical bodies are suitable for living. If that were the case, then, all physical bodies [e.g., rocks, metals] would be alive. By limiting the potentiality for life to organic bodies, he provides the criterion for distinguishing between physical bodies that have the capability to become the living things from those that lack that potentiality, and thus solves the major problem of prior materialist interpretations of the soul. In short, the answer to the question of what kind of body is capable of life is that it's the organic body, a body that is composed of organs which have individual functions but act for the sake of the whole body.

Aristotle's analysis yields the most general definition of the soul, that is, one that applies to every soul, and to all kinds of soul [at every level of life]. Specifically, "the soul is…the first grade of actuality of a natural organized body,"[145] or in Aquinas' translation, "the soul will be the primary act of a physical bodily organism."[146]

Moreover, Aristotle's concept of the soul as the form of the body accounts for the unity of the body and soul, that is, hylomorphism. Aristotle emphasizes that:

> "the soul is inseparable from its body, or at any rate that certain parts of it are (if it has parts) – for the actuality of some of them is nothing but the actualities of their bodily parts."[147]

Aristotle continues:

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[143] Smith [*From Schrödinger's Cat to Thomistic Ontology*, "The Thomist", 1999] uses the term activities, Aquinas uses the term operations.
[144] Aristotle, *De Anima*, *op. cit.*, 412a28 –b4; Aquinas, *Commentary on Aristotle's De Anima*, *op. cit*., # 230-232.
[145] Aristotle, *De Anima*, *op. cit.*, 412b4-6.
[146] Aquinas, *Commentary on Aristotle's De Anima*, *op. cit*., 412b4-6; # 233.
[147] Aristotle, *De Anima*, *op. cit.*, 413a3-10; Aquinas, *Commentary on Aristotle's De Anima*, *op. cit*., # 242-244.

> "That is why we can wholly dismiss as unnecessary the question whether the soul and body are one; it is as meaningless to ask whether the wax and the shape given to it by the stamp are one … Unity has many senses [as many as 'is' has], but the most proper and fundamental sense of both is the relation of an actuality to that of which it is the actuality."[148]

Thus, for Aristotle, the definition of the soul as the first grade of actuality of the natural organized body renders the question of how the body and the soul are joined completely irrelevant. The body and soul are not joined accidentally but they are one because the soul is the form of the body.[149] The relationship of soul [primary act] to the natural body is analogous to that of the form [actuality] to matter. As Aquinas puts it: "for as it is shown in *Metaphysics*, Book VIII, [Ch6 1045b15] the form is directly related to matter as the actuality of matter, once matter actually is, it is informed"[150] [informed matter].

Aristotle repeatedly asserts that prime matter is potentiality, that is, it has no being unless it is informed to be a specific thing. This means that if a thing is at all, it must already be informed matter. And just as form confers being on matter to be a particular thing, the soul confers being on a body to be a specific living organism. Just as a physical body cannot exist without its form, the living organism cannot exist without its soul. Thus, the fundamental meaning of actuality is that it gives matter its being by informing it, which means defining it as this particular thing. Later in the text, Aristotle addresses the question of the unity of the soul when he explains the soul as the essence of the body, that is, as its formal cause.

In sum, according to Aristotle the soul is the first act of the organic body and as such it is the basis for life.[151] But the question still remains, what does the primary actuality or the first act mean? That is, how does it explain life, or the unity of a living thing? The meaning of this concept becomes clear as Aristotle interprets the soul in terms of its being the cause. The notion of the soul as the formal, final and efficient cause explains how the soul realizes the potentiality of matter to become a living body. It would be completely unfair to expect Aristotle to provide an explanation in terms of modern scientific understanding; nevertheless, we can assess his analysis of the causality of the soul in terms of its explanatory power. It becomes clear that the enduring value of Aristotle's explanation lies not in his explanation of

[148] Aristotle, *De Anima*, *op. cit.*, 412b6-9.
[149] Aquinas, *Commentary on Aristotle's De Anima*, *op. cit.*, # 234.
[150] *Ibid*.
[151] Aristotle, *De Anima*, *op. cit.*, 412b10-17; Aquinas, *Commentary on Aristotle's De Anima*, *op. cit.*, # 235-238.

the scientific details of the mechanism of a sensory operation [e.g., hearing, seeing, etc.], as that is being accomplished with ever greater success through new scientific discoveries. The profundity of Aristotle's analyses consists, first and foremost, in uncovering and proposing metaphysical and epistemic principles that continue to challenge and expand our understanding of reality and of our being.

2.2.3. The soul as the cause: formal, final, and efficient

Aristotle's concept of the soul as the first actuality of the body potentially alive is rooted in the complementary notions of actuality and potentiality.[152] Because of the principle that only that which is in act can actualize potency,[153] that the actuality of the soul can realize the potentiality of the body that is capable of being alive. The soul as the first actuality is the essence of the body which gets further explanation in terms of its being the final and efficient cause. And the formal, final, and efficient causality of the soul explains the difference between non-living and living things, the unity of things, and the possibility of our knowledge of things as unified wholes.

Understanding the concept of the soul as the essence of the body potentially alive is a challenging enterprise, but especially so because of modern prejudice against the notion of essence, which is considered obsolete if not entirely meaningless. However, without studying at least some aspects of Aristotle's analysis of the soul as the essence of the body potentially alive, it is practically impossible to appreciate his definition of the soul.

The soul as the primary actuality of the organic body means that the soul is the essence of the organic body potentially alive. It is its "essential whatness", that is, the soul defines a body as a body that is capable of life. As Aristotle defines the soul: "it is the substance in the sense which corresponds to the definitive formula of a thing's essence. That means that it is 'the essential whatness' of a body of the character just assigned" [viz. *organized*, or possessed potentially of life].[154]

But what does this mean? How does it manifest itself? In order to explain the meaning of the soul as the essence of the body, Aristotle does several things. First, he defines the soul as the 'essential whatness' of the body potentially alive. Second, in order to explain what he means he draws an analogy between the soul and the form of an artifact. Third, he extends

[152] The notions of actuality and potentiality survived well into the middle ages and were the basis of understanding of physical reality..
[153] B. Wuellner, *Summary of Scholastic Principles*, Chicago, 1956, p. 5.
[154] Aristotle, *De Anima*, *op. cit.*, 412b10-14.

this analogy to include natural bodies, first, parts or organs of a natural body, and then, the entire organism. Fourth, in doing so, he expands the notion of the soul as the formal cause to include both its final and efficient causality. Consequently, the notion of final and efficient causality accounts for the unity of an organism. The final causality explains the directedness of organization towards effective maintenance and well-being of a living organism.

Aristotle uses the analogy with an artifact to illustrate the meaning of the essence of a physical body. The form of an artifact is easier to understand because it is usually the result of purposefully planned design. For example, an axe is 'a tool typically used for chopping wood, a steel blade attached at a right angle to a wooden handle'.[155] Thus, the essence of an axe is *what* makes a physical body an axe, and without this 'whatness', a body cannot be an axe.[156] The axe has a definite form, that is, its physical body is organized in a definite way with a defined purpose. But it is also important to observe that damage to any or all of its parts results in the axe's losing its form and consequently its capacity to function and to fulfill its purpose as an axe.

But it is much more difficult to understand the essence of a natural body. The form of a natural body is the result of natural processes of which we have only limited knowledge and so its essence is less obvious to us. Nonetheless, it is still possible to grasp, in general terms, what makes a natural body a particular thing, i.e., what makes it this and not a different kind of thing. If, for the sake of argument, we were to assume that an axe were not an artifact but a natural body, then its essence would be its being-an-axe or 'axeishness'. Its 'axeishness' would be its 'whatness'. That is, the essence of a natural body is its 'whatness'. What this means is that the essence confers definite being on matter, which becomes a definite natural body [e.g., a diamond, a dog, a giraffe]; moreover, without its essence, a thing ceases to be this particular thing. In short, the essence makes a body a specific body, and without its essence the body loses its identity as a particular being. Thus, the essence is that which is absolutely necessary for something to be such and such a thing. But the natural body that is capable of being alive differs even more from any natural body, because it also has the power of motion. All physical bodies undergo change or motion that is due to external factors acting upon them; however, in the case of living things, the principle of motion is intrinsic to them, that is, they are capable of initiating change or local motion on their own. Aristotle explains: "to be a natural body of a particular kind viz. one having in itself the power of setting itself in

[155] *New Oxford American Dictionary*.
[156] Aristotle, *De Anima*, *op. cit.*, 412b12-17.

movement and arresting itself,"[157] or, as Aquinas expressed it, "but of a natural such as has in itself the principle of motion and rest."[158]

In order to emphasize the difference between non-living and living bodies, Aristotle extends the analogy between the soul and the form of the inanimate body to the parts [organs] of living bodies. If for the sake of argument we assume that an eye is the entire body ['an animal'], sight would be its essence [its soul]. He then makes an analogy between a real eye and a painted eye. He points out that even if the same word describe them and even if they look very similar, there is a major difference between them that cannot be overcome by simply using same terms. The reason is the difference in their essence. The essence of an eye is its power to see and without this potentiality to see, as is the case of a painted or sculpted eye, the eye is not truly an eye. Thus, a painted eye is an eye only equivocally, but its essence is different.

Furthermore, through the example of a painted eye Aristotle's also expands his notion of the soul as formal cause to include its being also a final cause of a body capable of living. This example also shows that in the case of living things, the essence of an organ is intimately connected with its proper functioning and its purpose within the entire organism. An organ of a living body has a definite function and purpose. For example, in the case of an eye it is the capacity to see, and in order to fulfill its purpose of seeing, the eye must have the power of sight.

It is worth noting that the essence of an organ is not interpreted in purely mechanistic terms, that is, it is not only a description of its composition or the mechanism of operation. Rather, the essence of an organ is understood as its power to be, to act, and to function for the sake of the definite end [the definite purpose] within the context of the entire organism. The act of seeing is made possible by the power of sight, that is, it is entirely dependent on having the power/capacity to see. But this suggests that the power of sight is not identical with the act of seeing and it is not reducible to it. It makes the act of seeing possible, that is, it is the principle that allows matter to be organized with the definite purpose of seeing. Furthermore, if an eye is not properly formed it cannot perform the act of seeing. The power of sight depends on the proper organization of the physical aspect of the given body [matter], i.e., it is the proper organization of the bodily aspect that allows for proper functioning of the eye. The essence of an eye is sight, and sight/the power of seeing is dependent on properly informed matter. And to the extent that, unless it is an organ of the living body, an eye does not have

[157] *Ibid.*, 412b17.
[158] *Ibid.*, 412b17-25; Aquinas, *Commentary on Aristotle's De Anima*, *op. cit*., # 238.

the power of sight, both the activity of seeing and the power of sight are dependent also on the organization of the entire organism.[159]

Finally, Aristotle extends the analogy of the essence of a part of an organism to the essence of the entire organism in order to show that whatever applies to a part of a living body is applicable to a living body as a whole. Aristotle says:

> "what, therefore, holds of a part, we ought to apply to the whole living body, for the relation of a part [of the soul] to part [of the body] corresponds to that of sensitivity as a whole to the whole sensitive body, considered as such."[160]

What is true of the relation of a part of the soul to the part of the body is also true of the relation between the entire sensitive soul to the whole body. For example, what is true of the relation of the essence of an eye to the matter of an eye,[161] is also true of the essence of the entire body [the soul] to that body. The essence of an eye is sight, and without its essence an eye is not an eye truly but only equivocally, that is, it cannot fulfill its purpose of seeing. The essence of an ear is hearing, and without its capacity to hear the ear is not truly an ear because it cannot fulfill its purpose of hearing. By analogy, the essence of the body is the soul, that is, the power of the body to be alive. Without the soul, the organism has no capacity to sustain life and its vital activities, and thus it cannot fulfill its purpose of living. In short, what is true of the relation of the essence of an organ to that organ, is analogically true of an essence of the entire body [the soul] to that body. By gradually extending the analogy between the soul as the essence of the entire body to the essence of the artifact and to the essence of a part of an organism, Aristotle expands the notion of the soul as the primary act [the specifying principle, essence] of the natural body potentially alive, to include its final and efficient causality.[162]

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[159] It is important to make a distinction between the principle of organization as the condition [information] that allows matter to be organized in a definite way and the organized matter itself, that is, organization of matter into organs with a definite function and purpose. The form as the principle of organization is responsible for the proper organization of matter. But the principle of organization which is necessary for the proper organization is not reducible to organization itself. In other words, information that organizes matter is not identical to organized matter; for example, a piece of DNA is not the same as the information that codes for that DNA. A DNA strand only manifests information encoded in it. In short, the principle of organization is the information and it is not reducible to the organized matter [organs]. Organized matter is the embodied information.

[160] Aristotle, *De Anima*, *op. cit.*, 412b20-25.

[161] For Aristotle, the most obvious material component of the eye was the pupil, but in the present day, it is the complex vision apparatus.

[162] This notion of the soul can be further interpreted as the principle of organization which is responsible for the organization of the physical aspects that makes life possible. The vital operations express proper organization of organic body, that is, they reveal the power that makes them possible.

They manifest both the organization and that which makes this organization possible, its principle – the soul.

2.2.4. The unity of body and soul, and the body potentially alive

Aristotle's definition of the soul as the primary actuality of the body potentially alive demonstrates the primacy of the soul over the body and the unity of body and soul. This means the a living organism cannot survive without the soul. It is both body and soul together that make up a living organism. To illustrate this point, he draws an analogy between vital activities and an act of cutting. Just as an act of cutting is possible because of the power in the tool, so life is made possible by the soul. In order for an organism to be a living organism, the soul needs to actualize a body that has the capability to become alive, that is, the soul organizes the body in such a way that makes it capable to perform all vital activities. This dependence of the body on the soul implies the unity of body and soul. As Aquinas expresses Aristotle's idea:

> "As cutting or seeing is act, so is consciousness. The soul is like sight, and the capacity of a tool; the body like the thing in potency. But as an eye is a pupil together with the power of sight, so there is a living thing where there are both a body and soul… The body corresponds to what exists in potentiality; as the pupil and the power of sight constitutes the eye, so the soul plus the body constitutes the animal."[163]

The soul is inseparable from its body is because it is the realization of the potentiality of the physical body to become a living body. Furthermore, because the soul is the principle of organization, that is, it organizes matter into a body with a definite purpose of being alive, it is obvious that if this arrangement is disturbed or severely disrupted the entire body is affected even to the point of losing life. But the definition of the soul as the primary actuality of the body potentially alive implies that not every natural body is capable of being ensouled. The soul can realize the potentiality only of a body that is capable of becoming a living being. Aristotle explains that:

> "the actuality of any given thing can only be realized in what is already potentially that thing, i.e., in a matter of its own appropriate to it. From it follows that soul is an actuality or formulable essence of something that possesses a potentiality of being ensouled."[164]

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[163] Aquinas, *Commentary on De Anima*, *op.cit*., Bk.II, 412b25-413a3, # 240-241.
[164] Aristotle, *De Anima*, *op.cit*., 414a25-28.

Clearly, not every physical body is capable of becoming alive, for example, rock crystals or metals do not have the potentiality to become living things.[165] Aristotle indicates that the body potentially alive must be organic. In other words, the body's organs [organelles, parts] must be capable of forming and partaking in the unity whose purpose is to maintain life. At the very basic level of life this means the capacity to self-nourish, grow, and reproduce, that is, at the very least, it is the fulfillment of the basic drive to survive.[166]

2.2.5. The comprehensive definition of the soul

Aristotle's inquiry into the question of the soul follows a well-defined path. The general definition applies to all living things. The soul is the primary actuality of the body potentially alive, i.e., it is what distinguishes living from non-living things. The meaning of the soul as the primary actuality is then defined as the essence of the body. Finally, the comprehensive definition of the soul a develops the concept of the soul as the final and efficient cause of the body and offers a detailed explanation of how the soul is responsible for the three main modes of life, the nutritive, the sensitive, and the intellective.[167] I will mention only a few key points of the comprehensive definition as its detailed discussion is not necessary for this work. I will omit his detailed analysis of the three major of modes of life with the exception of sense-perception because of its importance for his concept of the mind.

The main goal of the comprehensive definition is to demonstrate that the soul is both the principle and the cause of a living body.[168] Aristotle accomplishes it through the detailed analysis of the fundamental vital operations and their respective objects. The format of the demonstration encapsulates his method of inquiry about the soul, according to which the detailed analysis of the fundamental vital operations reveals the powers of the soul that make these operations possible. It also demonstrates how the soul is the final and efficient cause of

[165] This is in contrast to philosophers who claimed that all things that have the principle of motion are alive [Mercury is alive because it moves, Aristotle, *De Anima*, *op. cit.*, Bk. I].
[166] I will not address questions posed by the theory of evolution for the notion of the body potentially alive nor any of the proposed solutions. Excellent sources for this discussion are: W. Wallace's *The Modeling of Nature* and M. J. Dodds' *The Philosophy and Nature* and his *Philosophical Anthropology*.
[167] Aristotle does not develop the concept of the mind and the intellect until Bk. III of *De Anima*.
[168] There is a distinction between principles and causes. A principle is "that from which something proceeds in any way. A cause is that from which something proceeds with dependence in being or becoming" [in M. J. Dodds, *The Philosophy of Nature*, *op. cit.*, Ch. 2].

the body capable of life, and thus the principle of life. Furthermore, Aristotle's analysis of sensation and sense-perception becomes an analog for his discussion of the intellect.

Aristotle's method of inquiry is both empirical and phenomenological. What this means is that he starts his inquiry with the observable facts that lead to their underlying principles. For Aristotle, the true knowledge is the knowledge of causes and underlying principles – to know is to understand the causes of things.[169] Thus, in order to understand how the soul is the principle and the cause of life, we have to understand the powers or capacities that make various vital operations possible. But this means we need to analyze the major ways in which life manifests itself, such as nourishment, sensing, local motion, perception, and thinking. And because different vital operations begin with their respective proper objects, we need to begin the inquiry with their proper objects. Aristotle's method of inquiry can thus be encapsulated in the formula that the proper objects point to vital operations which, in turn, reveal the powers that makes that operation possible and thus reveal the principle of life – the soul.

Aristotle indicates there are many vital operations, but they all can be subsumed under three fundamental modes of life: nutritive, sensitive, and intellective. The nutritive level is the most basic form of life, nonetheless, it is the foundation of all forms of life, from the very simple to the most complex. It demarcates the living from non-living things. It is characterized by the capacity for self-nourishment, growth, reproduction. The principle of life at that very fundamental level, Aristotle calls the nutritive [vegetative] soul.[170] The more complex and thus higher form of life is expressed in the capacity for sensation. It ranges from the very simple to the highly developed capacity for sensation and it belongs to all animals. The power of sensation is connected with the capacity to experience pleasure and pain, and with the power of local motion. The power of sensation is highly complex and Aristotle devotes much of *De Anima* to its detailed analysis.[171] But the most complex and the highest form of life is expressed in the intellectual activity that separates human from non-human animals. Aristotle's notion of the intellective soul is the basis for Aquinas' concept of the intellectual form which is the substantial soul of the human being. Aristotle's analysis of the potential and actual intellect provide the framework for Aquinas' notion of the intellect. It is

[169] Aristotle, *De Anima*, *op. cit.*, 413a13-20; Aquinas, *Commentary on Aristotle's De Anima*, *op. cit.*, Bk. 2, Lect. 2.

[170] To describe the nutritive soul in our contemporary language we would use such terms as physiological functions. However, the term nutritive soul has a deeper meaning than physiological functions because it also captures the purpose of nutritive activities for the maintenance and well being of the animal.

[171] See Ch. 3 of this work.

important to note that each living organism has only one principle of life, one soul. The soul of the higher organism encompasses and elevates the powers of the soul of the lower level, that is, the sensitive soul encompasses and elevates the powers [capacities] of the nutritive soul, and the intellective soul encompasses and ennobles the powers of both the nutritive and the sensitive souls.

The detailed analysis of vital operations demonstrates that the soul is the final and efficient cause. The organization of the living body reveals the soul as the formal cause and the final cause, whereas vital operations, especially the powers of sensation and local motion, also point towards its efficient causality. The most crucial feature of the vital operations is that they form and function as an organized whole. Each part of the organic body that is involved in a given vital operation has a specific function, and in a normally functioning organism it fulfills its function with certain predictability. But the functions of each and every organ are done for the sake of the entire organism, that is, the specific functions of each organ fit into the overall organization of an organism and are performed for its sake.

Even though vital operations reveal the soul as the specifying principle of the body, the soul is not reducible to them. They are not identical but rather point to the soul as their source that makes all of them possible – just as cutting or seeing reveals the power in the tool or the power of sight, the vital activities reveal the powers of the soul. Aristotle states: "the soul is the source of all these phenomena and is characterized by them, viz. by the powers of self-nutrition, sensation, thinking and motility."[172]

The analysis of vital operations reveals the soul as the final cause. It shows that the soul organizes the body so that it becomes a specific living body with the definite purpose for survival, self-maintenance, and well-being of the animal. Aristotle's example of the vital activity of nourishing not only illustrates his method of inquiry but shows its basic truth about life. For example, the purpose of food is nourishment through providing nutrients that are necessary to sustain life. The vital operation is digestion which is necessary to obtain nourishment. In order to understand how the process of digestion helps nourish our bodies, we analyze the operation of digestion. In other words, we analyze the mechanism of digestion, that is, by looking at the processes and breakdown of nutrients we gain understanding of both the process itself but also how digestion makes it possible for the entire body to maintain its health. This in turn leads us to the powers/capacities that make the vital operations possible. Analysis of the process of digestion allows us to understand the organization of structures that not only make the process possible but also work for the good

[172] Aristotle, *De Anima*, *op. cit.*, 413b10-13.

of the entire living body.[173] Aristotle's analysis of the mechanisms of various vital operation must, of course, be updated by modern scientific discoveries, nevertheless the principles of his analysis are borne out every day.

His analysis also shows the crucial difference between a body potentially alive and one that is not. A body capable of life is never a random arrangement of disconnected parts but it is a well-defined organism. Neither is it an arrangement typical of inanimate natural physical bodies. The arrangement of crystals in a rock [e.g., salt crystals] looks like a solid piece of salt; however, it is always only an aggregate of molecules.[174] Moreover, the aggregate may be broken into separate pieces without compromising or destroying the internal structure of the individual units. In contrast to man-made objects and natural physical bodies, the 'arrangement' of parts in the organic body is the purposeful organization of all parts that not only confers on an organism functional unity but is also necessary for an organism to live.[175] Each vital operation has a definite purpose in the overall functioning of the organism and it uses definite parts of an organism [organs, organelles, etc.] whose proper functioning make this vital operation possible.[176] But this implies that destruction of one or more parts of the organism not only affects its functional unity, but may result in its death. What make this complex organization possible is the principle according to which all elements, cells, and organs are arranged to form a living body. That is, the principle of organization [the soul] makes possible functioning at a very high level of organization. But how is the unity of an

[173] Reflection upon Aristotle's analysis of the nutritive power brings up the memory of a friend of mine who died of stomach cancer. The wisdom of Aristotle's observation and analysis is confirmed every day. The cancer destroyed the organization of my friend's digestive system to the point that it was not able to absorb any nutriment, any food. Even when she was given food, it was not turned into nourishment by her body. The definite, perfect organization of cells and tissues for the purpose of digestion and absorption of nutriment was destroyed. The food ceased to be food because it could not fulfill its purpose of giving nourishment; the damaged organization of digestive organs could not fulfill its purpose of absorbing food and sustaining other vital activities, and finally the organization was wrecked to the point that the nutritive soul ceased to be. This chapter is dedicated to the memory of all who have died of this and similar forms of cancer – the most devastating illnesses of the nutritive soul.

[174] They can form a crystal because of the molecular structure of salt, which is their specifying form. W. Wallace in *The Modeling of Nature* offers an excellent explanation of the substantial form of the inorganic world. All natural substances have their specifying form. My focus is on the soul as the specifying form of the living body.

[175] In the case of machines, houses, and other made objects, the different parts are also arranged into a functioning unit. However, two differences between living and non-living bodies stand out: 1] the form of an artifact is given to it by its designer or maker, whereas the form of the living body is educed from the potentiality of matter; 2] the principle of motion is intrinsic to the living body, it is not external to it, it does not have to be supplied to it.

[176] This is especially obvious in the case of individual organs of the human body, for example the heart, liver, or entire circulatory or digestive systems. Each organ has a well-defined function and its proper functioning is necessary not only for survival but also for the well-being of an organism. This is also true at the cellular and molecular level of a living organism.

organism different from that of man-made objects? After all, they are also arranged into functioning units, for example, a house, a machine, or a robot. Aristotle already explained the difference in the analysis of the soul as the essence. The difference consists, first, in the way the form is conferred upon the matter – the form of a man-made object is given to it by its designer or maker, whereas the form of the living body is educed from the potentiality of matter,[177] and second, the principle of motion is intrinsic to the living body, it is not external to it – that is, it does not have to be supplied to it.

In short, it is the definite organization of the organic body into the functioning whole that reveals the soul as the formal and final cause of the body potentially alive. Being its cause entails the priority of the soul to the body – the body is for the sake of the soul. The soul confers the definite purpose on the body.[178] In other words, the definite and specific organization of a living body makes it possible for it to live as this specific animal.

2.2.6. Aristotle's success

Aristotle's definition of the soul successfully solves the problems of prior interpretations of the soul and in this sense it is superior at capturing the essence of living things. In particular, it is able to explain the difference between living and non-living things, the unity of things and so the possibility of knowing whole things, and the difference between different modes of life.

First, the definition of the soul as the primary actuality of the body capable of life accounts for the difference between living and non-living things. Aristotle is able to accomplish this through the complementary notions of actuality and potentiality. The body

[177] Aristotle make a distinction between sensitive soul and intellect: "we have no evidence as yet about mind or the power to think; it seems to be a widely different kind of soul, (25) differing as what is eternal from what is perishable; it alone is capable of existence in isolation from all other psychic powers" [Aristotle, *De Anima*, *op. cit.*, 413b25]. Or, as Aquinas puts it: "those forms which have no activities that do not involve matter are such that composites exist through them and they themselves as it were coexist with composites rather than exist themselves. Hence just as their whole existence is in concretion with matter, so they are said to be totally educed from the potency of matter. The intellective soul, however, since it has an operation without body, does not exist solely in concretion with matter, hence it cannot be said to be educed from matter, but it is rather from an extrinsic principle. The intellective soul, however, since it has an operation without body, does not exist solely in concretion with matter, hence it cannot be said to be educed from matter, but it is rather from an extrinsic principle" (Aquinas, *On the Unity of the Intellect*, 2013, # 46].

[178] Aristotle, *De Anima*, *op. cit.*, 415b20. *"*All natural bodies are organs of the soul. This is true of those that enter into the constitution of plants as well as of those which enter into that of animals. This shows that that for the sake of which they are is soul.*"*

potentially alive means that it is a physical body that is capable of becoming a living body, which also implies that not all physical bodies have this capability.

Second, the interpretation of the soul as the formal, efficient, and final cause accounts for the unity of the living organism. This issue was not solved by prior interpretations of the soul. The soul as formal cause confers the specificity of organization on the body, it makes it this particular living body. The soul as the final cause accounts for the intricacy of the functional organization whose definite purpose is not only self-maintenance, but also well-being and thus fulfillment appropriate to the nature of a given organism.

Third, the detailed analysis of vital operations allows for the classification of the various ways that life manifests itself into three main modes of life: the nutritive, sensitive, and intellective. But most importantly, the analysis of proper objects and corresponding vital operations points to the powers that makes these operations possible, and thus reveals the soul as the principle of all vital operations.

CHAPTER 3
ARISTOTLE ON THE POWER OF SENSATION

Aristotle's analysis of the power of sensation is extremely detailed and most of it is not necessary to this project. I will focus instead on the key aspects of his analysis of sensation and perception[179] because they serve as the analog for his concept of the mind. But it is important to note they are only an analog, and as Aristotle himself wonders, the intellect seems to be a very different kind of power of the soul*:* "differing as what is eternal from what is perishable; it alone is capable of existence in isolation from all other psychic powers."[180] The discussion of Aristotle's concept of the mind will take me directly to Aquinas' argument on the subsistent character of the human intellectual soul.

Aristotle's goal is to understand what makes sensation[181] possible. What is its essence and what is its purpose? He disagrees with the view of materialist philosophers that sensation is simply due to the similarity of composition between the soul and the object of sensation,[182] but he agrees with them in that sensation involves some sort of change. In fact, most of his discussion focuses on the analysis of the change that happens in sensation. However, he offers a radically new understanding of change in terms of the concepts of potentiality and actuality. He also provides a detailed analysis of the process of sensation and demonstrates its purpose, which is the sustenance of vital operations such as growth, reproduction, and well-being of an animal.[183]

3.1. The key aspects of Aristotle' explanation of the power of sensation

Because Aristotle's analysis is very complex, it is helpful to itemize the main points and questions in order to guide the discussion of his analysis:

1. Sensation involves change. What is affected and temporarily changed are the senses.

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[179] Aristotle, *De Anima*, *op. cit*., 416b32 – 418a25.
[180] *Ibid.*, 413b25.
[181] *Ibid.*, 415a14-22.
[182] He disagrees with the view that sensation is possible because the soul is made up of the same elements as the rest of the universe.
[183] *Ibid.*, 414a29-418a25. To the extent that Aristotle not only describes the process of sensation but also gives reasons why sensation is needed for an animal, his analysis is superior to purely mechanistic explanations. Even though his description of the mechanism of sensation is inadequate given current scientific knowledge, nevertheless some aspects of his analysis are comparable to modern analysis of sensation, for example his emphasis on the process of sensation as change that starts with and is dependent on the external senses and their objects.

2. Change is caused by external objects acting upon the senses, objects that are dissimilar from senses.
3. The change that is involved in sensation is the actualization of the potentiality of the senses and of the power of sensation.
4. The power of sensation per se "is a ratio in a magnitude", it is a form of the senses. It is located in the sense organs but it is not reducible to them – it is the principle of the organization of matter.
5. There is a distinction between sensation and perception. Sensation is primarily the reception of sensible forms [qualities of objects][184] by the sense organs, while perception is the capability to perceive the object as a whole. Sensation and awareness of sensation belong to the same power of sensation, that is, there is no special sense for awareness of sensation.
6. Thus, the one and the same power of sensation is responsible for the sensation [operation of external senses], awareness of sensation, perception, and imagination. However, some activities are responsibilities of the external senses and some belong to the activity of an internal common sense.
7. Aquinas further organizes different operations of the sensitive faculty according to their being the responsibility of the external or internal senses. He also clarifies the difference in operations between the common or central sense, imagination, memory, and estimative power.[185]

3.1.1. Sensation involves alteration

The statement at the beginning of Aristotle's Chapter 5 [*De Anima*, Bk. II] encapsulates his primary focus on the analysis of sensation, that is, the kind of change it involves: "Sensation depends, as we have said, on a process of movement or affection from without, for

[184] The contemporary scientific description of sense-perception focuses primarily on the mechanism. It describes changes caused by objects, light, colors, etc. in sense organs and in the nervous system and brain. This includes a multitude of very specific changes in the entire set of cells located in a given sense organ, and changes of electrical and chemical energy. The mechanisms of sensing processes are extremely intricate, however the fundamental notion that sensation involves change remains the same. And Aristotle's fundamental understanding of the possibility of sensation is still correct in the sense that change is possible because of the potentiality for change in the faculty of sensation which has to be activated by a stimulus.

[185] The estimative faculty [in humans it is called the cogitative faculty] is one of the internal operations of the sensitive faculty and it involves its appetitive aspect. It ensures avoidance of pain and the pursuit of good such as survival, nutrition, reproduction, and the general fulfillment of animal's nature [W. Wallace, *The Modeling of Nature*, *op. cit.*, p. 174].

it is held to be some sort of change in quality,"[186] or as Aquinas expresses it: "sensation occurs in a being moved and acted upon; for it appears that sensation is a kind of alteration."[187] But if sensation involves alteration, then the questions are: firstly, what causes this change, i.e. what is changed and how; and secondly, what kind of change is involved in sensation?

First, Aristotle discusses what does not cause sensation. For him, sensation is not due to the similarity of composition between the subject of sensation [the sensitive soul] and the object of sensation. He argues that if we assume that everything consists of the same elements [the soul, senses, objects in the universe] and sensation is the result of the similarity of composition, this would imply that: 1) senses should be able to sense themselves, [e.g., sight would see itself, hearing would hear itself, etc.], and 2) senses would be sensing all objects of sensation all the time. But since this is not the case, the similarity of composition is inadequate to explain sense perception.[188]

But then what causes sensation? According to Aristotle, there are two requirements: a] external objects that act upon the senses, and b] dissimilarity between the sense organ and the object. that is, there is no sense-perception unless senses are stimulated by external objects[189] – "why without stimulation of external objects do they not produce sensation,"[190] Moreover, external objects must be dissimilar from the senses on which they act, but they cannot be entirely different.[191] And as the result of change due to sensation the sense and the object of sensation become alike. Aristotle says:

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[186] Aristotle, *De Anima*, *op. cit.*, 416b32.
[187] Aquinas, *Commentary on De Anima*, *op.cit*., # 351.
[188] Aristotle, *De Anima*, *op. cit.*, 417a2-9.
[189] This statement seems more controversial, given present knowledge of the sensory cortex of the brain. It is acknowledged that if the brain is stimulated by drugs, injury, etc., it is possible to experience sensations without stimulation of senses. It is crucial to note that Aristotle deals with pathology but is interested in explaining the normal process of sensation. And in the normal process, sensation is not experienced unless the senses are stimulated.
[190] Aristotle, *De Anima*, *op. cit.*, 417a3-5.
[191] *Idem*, *De Generatione et Corruptione*, New York, 1941, 323b20. Aristotle explains in what sense similar and dissimilar things can act upon each other. Basically, if two things A and B are 'like' each other in all respects it is reasonable to infer that they will not affect each other, because in such a case there is no reason for one thing to act any more than the other [we can think of perfect equilibrium]. Moreover, if like can be affected by like, then the thing could be affected by itself, and in this case the senses would be able to sense themselves [Aristotle, *De Anima*, *op. cit.*, 417a3-5]. The case would be the same if two things were completely different ['other'] because they could not affect each other's being except by chance. For example, whiteness could not be affected by a line or a line by whiteness unless it just happened that the line happened to be white or black. The point is that things that are either completely identical or completely different cannot affect each other. However, the things that are contraries or involve contrariety can affect each other. Things that can act and be acted upon have

> "what has the power of sensation is potentially like what the perceived object is actually; that is while at the beginning of the process of being acted upon the interacting factors are dissimilar, at the end the one acted upon is assimilated to the other and is identical in quality with it."[192]

Second, if the change involved in sensation is not due to the similarity of composition, what kind of change is it? Sensation is alteration due to an external object acting upon a sense. Aristotle explains that, in order for any motion [change] to happen, there have to be at least two things, one that is moved [patient] and one that acts. A thing that is acted upon [sense] is in potency [has the capacity to be altered] by a thing that acts. Thus change involved in sensation is interpreted in terms of potentiality and actuality that he illustrates through the analogy between sensation and knowledge.[193]

He analyzes several meanings of potentiality and actuality in regard to knowledge and then applies them to sensation.[194] The first sense of potentiality is having the capacity for knowledge by virtue of belonging to the class of beings that have the capacity for learning. Thus, humans, by virtue of having human nature, have the potentiality to gain knowledge via instruction and learning. This first potentiality is realized through instruction – a person possesses knowledge. The possession of knowledge is actuality in the first sense. But it is also potentiality in the second sense – a person can act on his knowledge. This second potentiality is realized through the transition from inactive possession to the exercise of knowledge and, as such, is the second sense of actuality – a person acts upon his knowledge. Thus, realization of the first sense of potentiality yields the first actuality which is also the second potentiality, and realization of the second potentiality is the second actuality. The two transitions from potentiality to actuality are distinct.

The analogy between sensing and knowing serves not only to explain the transition from potentiality to actuality, but also the difference between the sensitive and intellectual faculties, and thus also the difference between non-human animals and humans. All humans have the potentiality for intellectual knowledge – it is their unique characteristic. Similarly, the power of sensation belongs to all animals by virtue of their nature and thus it is the first

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to be in some ways identical [in kind] and some ways dissimilar [contrary in species]; a body is affected by another body, flavor by flavor.

[192] Aristotle, *De Anima*, *op. cit.*, 418a5.

[193] *Ibid.*, 417a21-417b16.

[194] I decided to spend a bit more time on this topic because it is both interesting and relevant to this work.

potentiality. This first potentiality is actualized when it is passed on from a parent to an offspring. At birth an animal has the fully developed power of sensation. Just as a man who possesses knowledge and can use it at any time, so an animal has a power of sensation that can be used at any time.[195]

However, there are major differences between the way the potentialities for knowing and sensing are actualized. The first difference is due to the kind of being that possesses the capacity. Again, all animals, including humans, possess inborn potentiality for sensation, however, only humans have inborn potentiality for intellectual knowledge. The second difference has to do with how the potency gets realized. In regard to humans, actualization of the potentiality to learn involves change, however, this change is not a substitution of one quality for another, but consists in the development of quality that already belongs to the nature of that being. The power of sensation also belongs to the animal [including humans] as its primary potentiality, however, the act of sensing has to be triggered by an external object acting upon the sense. The change involved in sensation is not the development of an already existing quality, but involves the assimilation of the external object [without its matter] by the sense and the resulting alteration of the sense and its organ. Moreover, the change involved in sensing cannot be initiated by the subject. Insofar as sensation is dependent on the external reality, the subject is, in a sense, the object of sensation.

There is a difference between the powers of knowing and sensation with regard to the realization of the potentialities in both senses, but especially so in the second sense [i.e., first actuality]. If the realization of the potentiality to know requires instruction and learning, the potentiality to sense is fully realized at birth. But this first actuality [the power of sensation developed at birth] is still in potentiality to be activated and requires an external object to act on it. It is in this sense that the power of sensation is passive. Thus, the actualization of the secondary potentiality in the case of knowledge and of sensation is of an entirely different kind. Whereas, in the case of knowledge, the realization of the second potentiality – the exercise of knowledge – depends on the subject, the knower, in the case of sensation, the realization of secondary potentiality [sensing] is dependent on an object affecting the sense. Sensation is so to speak 'at the mercy of the other'. There is one more clear difference between knowledge and sensation and it lies in their respective objects, namely if the object of knowledge is the universal, the object of sensing is always a particular and concrete individual. In Aristotle words: "The ground of this difference is that what actual sensation

[195] Aristotle, *De Anima*, *op. cit.*, 417b2-27.

apprehends is individuals, while what knowledge apprehends is universals, and these are in a sense within the soul." [196]

In short, Aristotle offers a radically new interpretation of sensation. Sensation indeed involves change and it requires external objects to affect sense organs. Moreover, for a sense organ to be affected by the object, they have to be dissimilar but not entirely different.[197] However, in contrast to previous explanations of sensation, Aristotle explains the change in the process of sensation in terms of the corresponding notion of potentiality and actuality. The potentiality to sense is actualized by the external object acting on the sense through its sense organ. Thus, sensation is the realization of the potentiality of the power of sensation. However, it is possible only because the sensitive faculty has the potentiality to be affected by the object, and without that potentiality, sensation would not take place at all. Aristotle thus provides the fundamental reason why things can be affected or changed. A thing can be affected by another because it has potentiality to be acted upon and altered.[198] The fundamental notions of potentiality and actuality are the very basis of the sheer possibility of any and all change.

3.2. What is the power of sensation as such? How is sensation possible?

Aristotle shows that change involved in sensation is the realization of potentiality to sense, and it requires that the object of sensation is external to and dissimilar from the sense. But is what is sensation in itself? Aristotle indicates that sensation is the power to receive the sensible forms of physical things, that is, it is assimilation of the sensible object but without its matter. Aristotle states:

> "By a 'sense' is meant what has the power of receiving into itself the sensible forms of things without the matter … By 'an organ of sense' is meant that in which ultimately such a power is seated."[199]

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[196] *Ibid.*, 417b20-27

[197] See the explanation of the conditions for change [footnote 191].

[198] The next question that naturally arises is about the process of this change. But even though understanding of the mechanism of change is important, the explanation of why this change is even possible at all is more important. The notion of potentiality and actuality explains how the mechanism of change is possible, and in this sense it provides the explanation on a deeper level than a solely mechanistic explanation. But the best scenario is to have both explanations, one in terms of principles and the other in terms of the mechanism.

[199] Aristotle, *De Anima*, *op. cit.*, 424a17-19, 424a26.

He uses an analogy between a sense organ and a wax to explain how sensation is possible. The sense receives the sensible form of an object without its matter in a similar way that wax takes on the impression of a gold or iron signet-ring. The impression in wax is produced by a ring, but gold or iron make no difference in the impression. What is important is the particular arrangement of the object's constituents. Aristotle explains:

> "in the way in which a piece of wax takes on the impress of a signet-ring without the iron or gold; we say that what produces the impression is a signet of bronze or gold, but its particular metallic constitution makes no difference: in a similar way the sense is affected by what is colored or flavored or sounding but it is indifferent what in each case the substance is; what alone matters [is important] is what quality it has, i.e., in what ratio its constituents are combined."[200]

This suggests that what is impressed on the senses, or assimilated by the senses, is not the material component of a sensible object but the arrangement of their constituents – their sensible form. In modern terms we would say the senses assimilate the particular molecular form of an object. We don't assimilate an apple but what makes apple an apple, that is, the particular arrangement of all its molecules and associated forces that give it a certain quality of an apple. Even though Aristotle lacks modern scientific knowledge, his understanding of sensation is basically correct.

Furthermore, he makes a clear distinction between the capacity to sense and the sense organ. The power of sensation is located in sense organs but their essence is not identical. As Aristotle says:

> "The sense and its organ are the same in fact, but their essence is not the same. What perceives is, of course, a spatial magnitude, but we must not admit that either having the power to receive or the sense is a magnitude; what they are is a certain ratio or power in a magnitude."[201]

This statement is difficult because it would suggest that, since senses receive physical objects without matter, the capacity to sense must also be immaterial. However, placing the power of sensation in the physical organ – "the sense and sense organ are the same in fact"

[200] *Ibid.*, 424a22-24.
[201] *Ibid.*, 424a25-28.

[202]– implies that he does not consider it independent of matter. However, the capacity to sense "is not a magnitude", that is, it is not simply matter, but it "is a certain ratio or power in a magnitude."[203] This suggests the sensation is possible because of the specific arrangement or organization of matter in a sense apparatus. Aquinas explains[204] that the power of sensation can be thought of as the form of a physical organ [material form]. Just as matter receives form and thus is the subject of form, similarly, a sense organ, by virtue of receiving sensation, is the subject of the sense faculty. The power is a certain ratio or proportion of the magnitude. In other words, it is an organization of the physical sensing apparatus that makes it capable of taking on sensible forms of the physical object [i.e., the particular arrangement of the components of the physical object that makes it what it is]. Furthermore, the definite organization of sense organs explains not only the possibility of sensation, but also the damage that can be caused by excessive stimuli. For example, excessively loud noise can disturb the organization of the sense organ and thus the capacity for normal hearing.

In sum, Aristotle's explanation of the power of sensation may sound foreign to our ears that are accustomed to modern scientific language. However, it is not inadequate in its fundamental understanding and principles. Sensation indeed involves change and for this change to happen there must be potentiality to undergo change. It is the capacity to receive and assimilate the object of sensation through assimilation of its particular qualities. This capacity is dependent on a definite organization of the material component of the sensing apparatus. The principles provided by Aristotle are sound, and not only do they not stand in the way of further detailed observation and experiment, but on the contrary, they provide their intellectual backbone.

3.3. Sensation and perception

Sensation relates primarily to the reception of sensible forms [qualities of objects] by sense organs, while perception includes the awareness of sensation[205] and the capability to perceive the object as a whole, that is, bringing together sensations from different senses. As already discussed, Aristotle argues that the similarity of elements cannot explain the

[202] *Ibid.*
[203] *Ibid.*
[204] Aquinas, *Commentary on Aristotle's De Anima*, *op. cit.*, # 555.
[205] We are aware of the object of sensations [sensible qualities] affecting our senses. As light [photons] affect the eye [specialized cells in the retina], we are aware of seeing. As the objects [sensible forms, light, sound, flavor, etc.] act upon our senses, we are aware of our seeing color, hearing sound, or tasting flavor. It is one and the same activity.

perception of an object as a whole. There must be something that unifies sensations from separate sense organs into an image of an object as a whole.[206] The question arises whether there is only one power of sensation or is there a need to posit another sense [or senses] that would explain both sensation and perception. Aristotle argues that these activities belong to one power of sensation and there is no need to posit another sense to explain the different activities.[207] To argue his point, Aristotle again employs the notions of potentiality and actuality, which also offers a good illustration of his notion of causation.

3.3.1. External senses - is there a need for another external sense?

First, Aristotle argues that the five senses [sight, hearing, smell, taste, and touch] are sufficient to explain sensation of all objects of sensation – proper, common, and incidental[208] – there is no need to posit another external sense to explain perception of different sensations. Second, he argues that sensation and awareness of it [perception] are one and the same act; however, their being is different. This difference is explained in terms of potentiality and actuality. Third, if that capability to have different sensations requires different senses, the capacity to bring them together into one object requires a unifying principle of perception. It is traditionally called the common sense.[209]

To the first question of whether we need to posit another external sense that would explain so called common and incidental sensation, Aristotle responds that there is no such need.[210] Each sense has the proper/special object that is unique to it, that is, it cannot be perceived by another sense and thus cannot be confused with another sense. For example, the object of sight is color[211] [212] and the proper object of hearing is sound. Besides proper objects, Aristotle distinguishes common sensibles and incidental objects of perception. Common

[206] This is the possibility of the unified perception of objects. This is different from Kant's proposed 'unity of apperception', which is the *a priori* structure of mind, i.e., the mind structures the raw data from the senses.
[207] The power of sensation also includes imagination, sensitive memory, and the ensuing capability to avoid pain and pursue good [activities that allow for fulfillment of an animal's nature, e.g., nutrition, growth, reproduction, survival, pleasure].
[208] Aristotle, *De Anima*, *op. cit.*, 424b20.
[209] Aristotle's and Aquinas' notion of the common [or central] sense has nothing to do with our everyday meaning of common sense.
[210] *Ibid.*, 424b20-425a20.
[211] Aristotle argues: the object of sight is visible, color is that which is visible, only sight can perceive color. But since light makes thing visible, in order to understand sight we also need to understand the nature of light.
[212] Aristotle, *De Anima*, *op. cit.*, 452a25. Each sense has its proper object of sensation.

sensibles such as movement, rest, number, figure, and magnitude are objects of all senses.[213] They do not need a special sense organ, i.e., an organ designated just for them, because they can be perceived directly by most or all senses. And if they needed a special organ, then perception of them would not differ from sensation of the proper objects of the five senses. Nor do incidental objects of senses[214] have a special organ because perception of them is only incidental, that is, they are associated only incidentally with objects that are sensed directly, for example, when in our perception of a flower we also perceive something white. In short, because the five senses are responsible for sensation of all of proper, common, and incidental objects of sensation, there is no need to posit another external organ of sense to explain the different sensations. Nonetheless, Aristotle explains that we do need more than just one sense because otherwise all sensations would be sensed as one indistinguishable identity. This would be true especially about the perception of common objects of sensation, but because they are sensed by different special senses, it is possible to distinguish them from each other and from the proper objects of senses.

A similar question arises about the fact the we are aware of our sensing.[215] Does our awareness of sensations require positing another sense that would be responsible for this awareness? Aristotle argues that this would result in the infinite regress of senses. If we posit a sense that is responsible for awareness of sensation, then we need to posit another sense that is responsible for the awareness of the awareness of sensation and so on *ad infinitum*. Since infinite regress is unacceptable,[216] this implies that there is only one sense that is aware of itself, that is, sensation and the perception of it is one and the same activity. Aristotle says: "even if the sense which perceives sight were different from sight, we must either fall into an infinite regress, or we must somewhere assume a sense which is aware of itself. If so, we ought to do this in the first case."[217] Nevertheless, Aristotle indicates that there is a distinction in their being: "the activity of the sensible object and that of the percipient sense is one and the same activity, and yet the distinction between their being remains."[218]

Thus Aristotle employs the notions of potentiality and actuality to explain that although sensation and perception differ in their being [are identical], they belong to one and the same

[213] *Ibid.*, 425a25-30.
[214] *Ibid.*, 425a30.
[215] *Ibid.*, 425b10-15.
[216] Aquinas, *Commentary on Aristotle's De Anima*, *op. cit.*, # 586. Because "no action could ever be completed which depended on an infinity of actions, and because no single subject can possess an infinite number of faculties."
[217] Aristotle, *De Anima*, *op. cit.*, 425b15.
[218] *Ibid.*, 425b26-30.

power of sensation. Moreover, the action of an object of sensation on the sense organ [sensation] and the sense perceiving the object [being aware of that sensation] is the same activity. For example, the actual sounding of a drum and the actual hearing of this drum is the same activity of sounding and hearing. Clearly, a person who can [has potentiality to] hear may not be hearing the sound, and the drum which has potentiality to make the sound is not always sounding. However, when there is, at the same time, both the sounding [of a drum] and the hearing of it, this is one and the same act. The same is true in regard to other senses. When the color is seen, then color and seeing it are one and the same act. When flavor is tasted, tasting and flavor are one and the same act. That is, sensing and the awareness of it [perception of it] are one and the same activity. As Aristotle says:

> "if it is true that the movement, both the acting and the being acted upon, is to be found in that which is acted upon, both the sound and the hearing so far as it is actual must be found in that which has faculty of hearing**;** for it is in the passive factor that the actuality of the active or motive factor is realized;[219] "that is why that which causes movement may be at rest."[220]

Sensing and awareness of it [perceiving] is one and the same activity, but their being is different. But what exactly does this mean? It would seem that if their being is different their acts are different [221]and they belong to different powers. This is where Aristotle's genius shines. He uses the notion of potentiality and actuality to explain how these two activities are one and the same, and thus belong to one faculty.[222] As potentialities they are distinct but as actualities they are one and the same. That is, the potentiality to sense and potentiality to be aware of sensation exist separately, e.g., an ear has potentiality to hear the sound but it may not always hear the it [hearing apparatus may be damaged]. Just because the percipient sense has the potentiality to sense it does not mean this potentiality is always actualized. It is actualized when there is awareness of that sensation – in its being perceived. It explains their different being. Furthermore, Aristotle states that the concepts of potentiality and actuality also explain how things can affect one another, that is, the notion of causation: "both the

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[219] *Ibid.,* 426a5.
[220] *Ibid.,* 425b30–426a10, [*cf.* Aristotle, *Physica. op. cit.*, III. 3].
[221] B. J. Wuellner, *Summary of Scholastic Principles, op cit.,* p. 97. According to the principle that "action follows being", "as a thing is so it acts."
[222] Aquinas, following Aristotle, will use the same idea to explain the intellect. Active and passive intellect are one intellect but their operations are different [see Ch. 4 of this work].

acting and the being acted upon, is to be found in that which is acted upon."[223] In regard to sensation, this means that action of the proper object of sensation [e.g., color, sound, etc.] upon the sense [sight, hearing] happens in the appropriate sense. Moreover, an action of a physical object proceeds from its form – "action is proportionate to the nature of the agent."[224] For example, hitting a drum will result in a drum making sound – a drum has the potentiality to sound. A physical thing can be sensed, that is, it has the potentiality to be sensed. The sounding of the drum has the potentiality to be heard. However, the potentiality of the sound to be heard can be actualized only in that which has the potentiality to hear the sound. That is, for the sound to be heard there has to be something that has potentiality to hear it, namely, the sense of hearing.

However, there is a crucial distinction between the potentiality to sound and the potentiality to be heard by the sense of hearing. The potentiality to sound is dependent on the form of an object, in this case a drum. But the potentiality to hear this sound is in the sense of hearing and it can be realized only in the sense of hearing. This means that the drum may sound but it may not be heard, for example, the drum is far away, or the sense of hearing is damaged. Thus, it is crucial to distinguish between the potentiality of the drum to sound and the potentiality to hear the sound. They are not the same potentialities. The former belongs to the object [drum] the other to the subject [the sense of hearing].

Furthermore, each sense has the potentiality to be acted upon, affected by the objects of sensation. The sense of sight has the potentiality to be acted upon by light, the sense of hearing to be affected by sound, the sense of taste by flavor, and so on for each sense. As the object of sensation acts upon it, for example, as the sound acts upon the sense of hearing, it activates it. That is, the sense get actualized by the object of sensation that acts upon it. The sense of sight is actualized by light acting upon it[225] – it is seeing the color. The sense of hearing is actualized by the sound acting upon it – it is hearing the sound. As the sound is acting upon the hearing apparatus [sense] the potentiality to hear the sound is actualized in the actual hearing of the sound. Aristotle explains: "for it is in the passive factor that the actuality of the active or motive factor is realized; that is why that which causes movement may be at rest."[226] The sound and hearing of the sound is one activity that is realized in the same sense and at the same time. Aristotle continues: "for as the-acting-and-being-acted-upon is to be

[223] Aristotle, *De Anima*, *op. cit.*, 426a1-5.
[224] B. J. Wuellner, *Summary of Scholastic Principles*, *op cit.*, p. 27.
[225] This would include all organs involved in seeing, that is, specialized cells in the eye, nerve cells, brain, and all energy transmissions between different cells.
[226] Aristotle, *De Anima*, *op. cit.*, 426a10-12.

found in the passive, not in the active factor, so also the actuality of the sensible object and that of the sensitive subject are both realized in the latter."[227] Thus, although the action of the sound upon the sense of hearing and thus the realization of the potentiality to hear the sound [e.g., actual hearing of the sounding drum] depends on the sense of hearing, the potentiality of an object [e.g., a drum] to make the sound is independent of the sense of hearing.

The distinction between the potentiality to make a sound and potentiality for the sound to be heard by the sense of hearing [to hear the sound] is also important because it addresses the problem of the existence of an external world that is independent of our perception. A typical question is whether an object exists if there is no one to perceive it, for example, does a falling tree makes a sound unless there is someone to hear? Aristotle solves the problem through the concept of potentiality and actuality. He explains that in so far as the object of sensation is acting on the sense, and its action is being realized [there are no obstacles to realizing it], both the object of sensation and the sense are one, they are both actual. And if the object of sensation stops acting upon the sense then actual sensing ceases to be – the actual sounding and actual hearing must appear and disappear from existence at the same time. As existing actually [sounding and hearing] they are simultaneously dependent on each other. However, as potentialities they can exist separately. Aristotle says:

> "Since the actualities of the sensible object and of sensible faculty [power] are one actuality in spite of the difference between their modes of being, actual hearing and actual sounding disappear from existence at one and the same moment … while as potentialities one of them may exist without the other."[228]

The tree may be making a sound as it is falling but the potentiality of the sense to hear it is not realized because the tree is too far away to be heard or the sense of hearing is damaged. Only if an object is acting directly on the sense, and if the sense can be activated by it [there are no external or internal obstacles], can sensation be actualized [sound heard]. The actual sensation requires the realization of the potentialities of both the sensible object to act on the sense and of the sense to perceive it.[229] However, as potentialities, they can exist separately. Aristotle's analysis of sensation and perception in terms of potentiality and actuality is also a

[227] *Ibid.*, 426a10-12.
[228] *Ibid.*, 426a15-20.
[229] I would add, that unless there are absolutely no living creatures that can hear, a tree will definitely makes a sound simply because there is always some creature that can hear a falling tree. Either way, Aristotle concepts of potentiality and actuality superbly solve the seemingly unsolvable problem.

good illustration of causation. The cause and effect are one event.[230] There is no effect without its cause, but not every cause has an observable effect because the effect could have been prevented by something interceding. That is, the potentiality of the cause has not been capable of being actualized.

3.3.2. Common sense as the unifying internal principle of sensations

Another question involves two overlapping issues: the merging of different sensations into one object of perception, and the possibility of differentiation between different qualities. This section will deal with the internal as opposed to external aspects of perception, that is, with the aspect of the power of sensation that does not directly touch the external world.

Aristotle argues that in order to distinguish between different qualities that are perceived together there has to be something that can accomplish two things: bring different sensations together and at the same time differentiate between sensations that come from different senses. This principle, called the *common sense*,[231] also addresses one of the main problems of prior interpretations of the soul, namely, the lack of explanation of how it is possible to perceive objects as wholes. The common sense belongs to the internal activity of the power of sensation. It can be thought of as the first step in the internal process of sense perception accomplished by the nervous system and brain.

This is a challenging part of Aristotle's analysis of perception. The question is how we differentiate between different qualities that can be perceived in one object but are not always associated with each other. For example, when we sense sweet and white, we separate them. Each of the five external senses has its proper objects of sensation and distinguishes between related qualities. Sight can distinguish between different colors [e.g., black or white, etc.] and taste between different flavors [e.g., sweet or bitter]. But the question is what differentiates between qualities that come from different senses and are perceived together? What discriminates between flavor and color, e.g., sweet and white or bitter and black? In Aristotle's words:

> "Each sense then is relative to its particular group of sensible qualities: it is found in a sense-organ as such and discriminates the differences which exist within that group; sight discriminates white and black, taste sweet and bitter, and so in all cases … Since

[230] See Chapter 1 of this work.
[231] The name common sense has been traditionally accepted. Aquinas also uses this term.

we also discriminate white from sweet, and indeed each sensible quality from every other, with what do we perceive that they are different? It must be by sense; for what is before us is sensible objects Hence it is also obvious that the flesh cannot be the ultimate sense-organ, if it were, the discriminating power could not do its work without immediate contact with the object."[232]

Aristotle discussion may be divided into two main parts. First, he explains what is required to make differentiation possible – a sense, self-identical, same time. Second, he explains how this is possible, that is, how one sense can be that which unifies and differentiates at the same time. To explain how this sense can be both 'indivisible and divisible', he employs a comparison with a point. Aquinas will later emphasize that the common sense is passive, nevertheless, this does not make it inferior to the external senses or their objects because it is the root of all sensitivity. It makes sensing possible by 'bringing it' to the sense organs and receiving them back.

Aristotle first argues that in order to perceive the different qualities, they have to be received by something that a] must be a sense faculty, b] must be one [self-identical], and c] must be able to bring all sensations together and at the same time differentiate between them.[233] I elaborate on these arguments below:

a] That which is capable of receiving different sense impressions from external senses must also be a sense. Insofar as qualities of things are not just ideas, for example, an idea of sweet or bitter, but they are sense impressions, they have to be perceived by a sense.[234] This indicates that there must be a physical organ[235] that is able to receive sensations. Aquinas elaborates: "Now all sensuous activity being organic, this common sensitive principle must have its organ; and since the organ of touch is all over the body it would seem to follow that, wherever the ultimate root of the organ of touch may be, there is also the organ of the common sensitive principle. It was with this in mind that Aristotle has said [602] that if flesh were the fundamental organ of touch, we should discriminate between various sense-objects by merely touching things with our flesh."[236]

[232] Aristotle, *De Anima*, *op. cit.*, 426b8-16.
[233] Aquinas, *Commentary on Aristotle's De Anima*, *op. cit.*, # 601.
[234] *Ibid*.
[235] The common sense is spatially single, for example, we can think of it in terms of the parts of the motor-sensory cortex of the brain performing this function..
[236] Aquinas, *Commentary on Aristotle's De Anima*, *op. cit.*, # 611.

b] That which can differentiate between qualities has to be one and the same sense faculty. If there were two of them, one faculty would sense only one sense impression [e.g., sweet], and a second faculty another one [e.g., bitter]. They would always be sensed separately; however, this would not solve the problem of how it is possible to perceive two different qualities in one object, and at the same time distinguish between them as not always coexisting in the same object. For example, white and sweet can be sensed together [e.g., in this particular sugar] but this does not mean they always occur together in a given object, that is, not every time something is sweet is it also white. Thus this faculty has to be one and same [self-identical].[237] Since the difference can be perceived only in relation to something that is one and the same [identity], the discrimination between qualities must be accomplished by one and the same faculty [self-identical]. In Aristotle's words: "Therefore what asserts this difference must be self-identical, as what asserts, so also what thinks and perceives,"[238] And Aquinas adds: "Hence Aristotle's conclusion, that it is clearly impossible to perceive 'separate objects', i.e., that two things are distinct, by 'separate', i.e., by distinct means; there must be one single power aware of both things."[239] Moreover, Aristotle states that the perception of different qualities must happen at the same time: "Both the discriminating power and the time of its exercise must be one and undivided."[240] The reason is that if it happened at different times there would be no way of knowing if different qualities belong to different objects or to one.[241]

c] Furthermore, insofar as this sense faculty has to be able to receive all sensations and also differentiate between them, it cannot be like any of the particular senses, including even the fundamental sense of touch.[242] If it were like a particular sense, then its capability to receive sense impressions would be like that of a particular sense, that is it would receive only impressions relating to that sense. However, that which discriminates between different qualities has to belong to all sensations, that

[237] The common sense has to be self-identical because it makes possible differentiation between qualities. Difference is perceived against identity.
[238] Aristotle, *De Anima*, *op. cit.*, 426b21.
[239] Aquinas, *Commentary on Aristotle's De Anima*, *op. cit.*, # 604.
[240] Aristotle, *De Anima*, *op. cit.*, 426b29.
[241] Aquinas, *Commentary on Aristotle's De Anima*, *op. cit.*, # 605.
[242] Aristotle, *De Anima*, *op. cit.*, 422b17-423a22. The sense of touch is the most fundamental of all senses. If other senses, for example sight, receive one type of quality [color], touch receives different kinds of qualities – different contrarieties – such as hot and cold, soft and hard, dry and wet. Severe damage to the sense of touch [e.g., a significant burn] may result in death.

is, all sensations must terminate in it as their common ground. This power lies as the root of all senses, that is, all sensitivity flows from it to the external senses and all sense-impressions flow into it. This is the reason it is traditionally called common or central sense. This sense faculty, according to Aquinas: "cannot be attributed to touch as a particular sense, but only as the common ground of the senses, as that which lies nearest to the root of them all, the common sense itself.''[243] He continues: "it is a common sensitive principle, aware of several objects at once because it terminates several organically distinct sensations; and as such it functions as separate. But just because it is one in itself it discerns the difference between these sensations."[244] In other words, we might say that because it is one, it can serve two 'functions": a] it is common to all sensation, and b] it is its oneness that makes differentiation possible.

Aristotle's second argument addresses how it is possible for the common sense to simultaneously receive different qualities and also tell them apart. How is it possible to be numerically one, and yet distinguish between different objects? The problem is linked directly to the nature of perception, namely, when a perceiving subject assimilates the form of an object, in a way it 'becomes this object'. But how can one numerically single subject [the common sense] assimilate, 'become', different objects? Aristotle says:

"But, it may be objected, it is impossible that what is self-identical should be moved at one and the same time with contrary movements in so far as it is undivided, and in an undivided moment of time. For if what is sweet be the quality perceived, it moves the sense or thought in this determinate way, while what is bitter moves it in a contrary way, and what is white in a different way."[245]

Aristotle continues:

"Is it the case then that what discriminates, though both numerically one and indivisible, is at the same time divided in its being? In one sense, it is what is divided that perceives two separate objects at once, but in another sense it does so qua undivided; for it is divisible in its

[243] Aquinas, *Commentary on Aristotle's De Anima*, *op. cit*., # 602.
[244] *Ibid*., # 610.
[245] Aristotle, *De Anima*, *op. cit.*, 426b30.

being, but spatially and numerically undivided? In one sense, it is what is divided that perceives two separate objects at once, but in another sense it does so qua undivided, for it is divisible in its being but spatially and numerically undivided."[246]

It would seem that the common sense should be one [indivisible] but also divisible. This, however, would violate the principle of contradiction that states the thing cannot be and not be at the same time and in the same respect. A thing can be its contraries only in potentiality, but not in actuality. For example, a thing can be actually white and potentially black but it cannot be actually white and actually black at the same time and in the same respect. When an object of perception [e.g., color white] is acting on the sense, the potentiality of the sense to receive white is actualized – it 'becomes its object', it is white. But if it is white it cannot 'be' black at the same time. Aristotle states:

> "what is self-identical and undivided may be both contraries at once potentially, it cannot be self-identical in its being—it must lose its unity by being put into activity. It is not possible to be at once white and black, and therefore it must also be impossible for a thing to be affected at one and the same moment by the forms of both, assuming it to be the case that sensation and thinking are properly so described."[247]

If both white and black are acting on the common sense, the common sense would have to assimilate [be actualized by] both qualities, black and white. That is, it would be actualized by a set of contraries. In contrast, if the common sense receives black and bitter, it would be actualized by both of them. That is, it would become two different qualities at the same time. This happens all the time and we can sense different qualities at the same time. But how can this be possible? After all, the common sense is capable not only of receiving different qualities but also of discriminating between them. How can the common sense be 'both divisible and indivisible' and still obey the law of non-contradiction? Aristotle explains this difficulty by comparing the common sense to a concept of a 'point'. The point can be regarded in two different ways. It can be viewed as one [indivisible] when it is the continuation of a line before and after it. Or it can be viewed as two [divisible], as the end of one line and the beginning of another. In Aristotle's words:

[246] *Ibid.*, 427a1-5.
[247] *Ibid.*, 427a5.

> "The answer is that just as what is called a 'point' is, as being at once one and two, properly said to be divisible, so here, that which discriminates is qua undivided one, and active in a single moment of time, while so far forth as it is divisible it twice over uses the same dot at one and the same time. So far forth then as it takes the limit as two, it discriminates two separate objects with what in a sense is divided: while so far as it takes it as one, it does so with what is one and occupies in its activity a single moment of time."[248]

Furthermore, both Aristotle and Aquinas maintain that just as external senses are passive so is the common sense.[249]Just as the potency of the external senses is actualized by the objects of sensations, the potency of the common sense is actualized by receiving and assimilating all impressions. However, this does not mean that particular external senses [hearing, vision etc.] are inferior to the external objects that act upon those senses, or that the common sense is inferior to sense impressions. Even though it would seem that objects are superior to senses for a couple of reasons: a] they act upon the sense; and b] whereas an external object actually possesses a given quality actually [e.g., it is white or red], a sense has it only potentially. However, Aquinas explains that it is rather objects that are ennobled as they are received by the senses by virtue of sensitivity: "hence in receiving the object immaterially it ennobles it, for things received, take as such the mode of being of the receiver."[250] That is, even if that which acts [the mover], as such, is superior to that on which it acts, the act is received according to the mode of the receiver.

Similarly, even if it would seem that because particular sense organs act upon [terminate in] the common sense, they are superior to it, this is not the case. The reason is that, just as the particular senses by virtue of their capacity to sense are superior to external objects, so the common sense is superior to the particular senses. This is because it is the root of all sensitivity. The common sense receives all particular sensations according to its own mode of being which is one. That is, by being the terminus of all sensations the common sense unifies them, and thus makes possible the perception of an object as a whole.[251] As Aquinas puts it:

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[248] *Ibid.,* 427a10.
[249] Aquinas, *Commentary on Aristotle's De Anima*, *op. cit.*, # 612.
[250] *Ibid.,* # 612, "for things received take, as such, the mode of being of the receiver."
[251] This a truly amazing analysis of the power of sensation. It points to the common physical sensing area – we can identify the sensory-motor cortex – but it also stresses the immaterial aspect of its functioning.

> "and the common sense receives its object in a still nobler way because it lies at the very root of sensitivity, where this power has its point of greatest unity. Yet we must not suppose that the common sense appropriates actively the impressions received in the sense-organs; all sensitive potencies are passive; and no potency can be both active and passive."[252]

In short, this is an amazing account of the nature of sensation and perception. Undoubtedly, the details of the mechanisms of sensation and perception continue to be discovered with modern scientific approaches. However, the fundamental theoretical framework was already provided by Aristotle and further clarified by Aquinas. Aristotle's analysis of the perception answered the problems that ancient materialist philosophers were unable to solve. Specifically, in regard to perception, he was able to explain why we need more than one external sense. Second, using the notion of potentiality and actuality he was able to explain that sensation and awareness of it belong to the same power of sensation. Third, he explained that in order to account for the differentiation between objects of sensation and the capacity to perceive objects as wholes, there must be a self-identical, internal sense faculty that became known as the central or common sense. Its function as the source of sensitivity has been corroborated by modern science in the discovery of the motor-sensory cortex of the brain.

Aristotle's analysis of perception serves as the springboard for his analysis of the mind. However, it is crucial to distinguish between the sensitive and the purely intellectual aspects of the mind. The difference between them is further clarified and developed by Aquinas and becomes the foundation for his distinction between the sensitive knowledge of the animal and the intellectual knowledge of the human being. It also forms the basis of the difference between the animal soul and the human intellectual soul, and Aquinas's arguments for the immateriality of the human intellect.

3.4. Distinction between perception and thinking

Even though both sensation and perception belong to one and the same sensitive faculty, nonetheless they are engaged in different aspects of it. Sensation is responsible for receiving individual sensations from different external senses. Perception is the bringing together of these sensations and differentiating between them. This is accomplished by the

[252] Aquinas, *Commentary on Aristotle's De Anima*, *op. cit*., # 612.

internal common [central] sense. Using modern scientific terminology, we would say that these functions are accomplished by the external sense organs, the nervous system, and the brain.[253]

But in making a distinction between sensation and perception, Aristotle has stepped into the new territory of internal sensation, one that is responsible for most but not all of the animal behavior. Aristotle's analysis focuses on the common sense that is responsible for perception and imagination, and to a lesser extent on memory and sensitive knowing. The latter two are further clarified and developed by Aquinas as he distinguishes two more internal senses: memory and the estimative sense. It is important to note that, even though each of these internal senses has its proper object and specific area of activity, all of the external senses and the internal senses belong to one sensitive power.[254]

The final territory of Aristotle's analysis of the soul is the mind and the intellectual activity. Both Aristotle and Aquinas make a very clear distinction between sensitive knowledge and intellectual knowledge. Although this distinction is often ignored or even eliminated from modern philosophy of mind, it is absolutely crucial for the understanding of Aristotle's and Aquinas' concepts of the intellect. It demarcates the abstract activity of the intellect from other forms of knowledge, i.e., sensitive knowing. Internal sensation is responsible for all sensitivity and it includes common sense, imagination, estimative sense, and memory. It is because of their sentience that animals are able to react to and deal with and even control their environment. This is especially true of the higher animals whose behavior often seems akin to thinking. Nevertheless, Aristotle insists on the difference between sensitive knowledge and thinking. In fact, he stresses the differences not only between sensation and perception and thinking, but also between imagination and thinking.

Aristotle admits that it can be easy to assume that since both sense perception and thinking deal with reality, they are the same.[255] And this was the exactly the claim of the ancient materialist philosophers [e.g., Empedocles, Democritus], who held that one can know the universe because one's soul, including one's mind, is made up of the same elements as the rest of the universe. This view implied that just as sensation is possible because of the similarity of the elements so is the activity of thinking. Aristotle uses two arguments against

[253] M. O'Shea, *The Brain – A Very Short Introduction*, Oxford, 2006. Modern science also distinguishes between sensation and perception.

[254] For example, the estimative sense is involved in the appetitive aspect of the sensitive power and deals with the pursuit of concrete goods by the animal and avoidance of danger, that is, it deals with more practical aspects of an animal's behavior. I will not discuss it because it is not directly needed for this project.

[255] Aristotle, *De Anima*, *op. cit.*, 427a20.

equating perception with thinking: the first one is based on the possibility of error, the second one on the observation that if sensation characterizes all of the animal kingdom, thinking is found only in a small portion of it.[256]

Aristotle first points out that the similarity of elements between one's soul and the universe does not account for the presence of error. But it is obvious that there is error; in fact, error is more prevalent than truth. It can be observed in the behavior of the higher animals that are capable of perception, and especially in humans, who besides sensitive knowledge are also capable of thinking. However, if thinking is identified with sense perception, then there are basically two options: first, whatever is perceived is true, that is, whatever seems is true, and thus there is no error; or second, if knowledge is based on the principle that 'like knows like', then error must be based on the contact with the unlike, which is the opposite of like.[257]

Aristotle argues that if I accept the principle that 'like knows like', then I would never be able to know the unlike. That is, I would never be able to know the contrary of 'like'; but this would be against the principle of knowledge, according to which we have knowledge of both contraries.[258] If I know one contrary, then I also know the other. And if I am in error about one contrary, I am in error about the other. For example, if I know white, I also know the opposite of white. And if I do not know what cold is, then I will not know what heat is. As Aristotle says: "But it is a received principle that error as well as knowledge in respect to contraries is one and the same."[259]

Thus, if knowledge were based on contact with 'like' things then we would not be able to know contraries of things. But we do know contraries, therefore knowledge cannot be explained by the similarity of elements. In short, perception does not account for true knowledge, and thinking is not the same as perception. Aquinas explains: "It follows that touching a like thing cannot cause true knowledge if touching an unlike thing causes error; for in that case one would know one pair of opposites and be mistaken about the other."[260]

Aquinas also points out that it could be argued that materialist philosophers did not really need to account for error.[261] First, if everything that seems is true, there is no error and so there is no need to explain error.[262] Second, if knowledge is explained by contact with the

[256] *Ibid.*, 427a26-427b8.
[257] *Ibid.*, 427b1-3.
[258] Aquinas, *Commentary on Aristotle's De Anima*, *op. cit.*, # 628.
[259] Aristotle, *De Anima*, *op. cit.*, 427b5.
[260] Aquinas, *Commentary on Aristotle's De Anima*, *op. cit.*, # 628.
[261] *Ibid.*, # 626.
[262] *Ibid.*, # 627. Aristotle answered the first problem in *Metaphysica*, New York, 1941, Book IV.

like, then error obviously implies contact with the unlike. In other words, if 'like knows like', that is, if I know something because there is likeness between me and the object, then there is error if there is no likeness between me and the object. I am in contact with the unlike. This, however, would be a simplistic explanation of error.[263]

The second difference between understanding and sensation is that, while both practical and speculative understanding are either correct or incorrect, sensation is always free of error.[264] The reason is that each particular sense has its proper objects; for sight, it is color and the visible, for hearing it is sound, for taste it is flavor. Sensation is not mistaken as to its proper object of sensation, however, thinking can be either true or false. As Aristotle says: "rightness in prudence, knowledge and true opinion, wrongness in their opposites."[265] Therefore, thinking is not the same as sensation. Furthermore, thinking is different from perceiving because sensation characterizes all of the animal kingdom, but thinking is found only in the small portion of the animal kingdom, specifically in humans. Even if some non-human animals also have some sort of wisdom, it is not the result of reasoning but is rooted in their instincts. In contrast, both speculative and practical thinking require rational deliberation about what is correct or incorrect, and in so far as we know, it belongs only to humans.

3.5. Imagination

Once he distinguishes between sense perception and thinking, Aristotle begins to analyze imagination.[266] He seems almost baffled by it. Imagination is neither sensation or perception. It belongs to more advanced animals but not to all. Whereas perception is necessary for imagination, thinking is not necessary for it. Imagination does not belong to the intellect, but thinking needs imagination.

Aristotle's analysis of imagination is especially relevant because imagination is even more connected with the intellectual power than sense perception. It seems to lie on the cusp between sensitive and intellectual knowledge. And just as there is no imagination without

[263] It could also be argued that if everything in the universe, including me, consists of the same elements, then, in principle, I could know all things, that is, and I would never have to be in error. This is obviously not the case because there is error and it is even more abundant than truth. This suggests that similarity of the elements is not enough to explain error.
[264] Aquinas, *Commentary on Aristotle's De Anima*, *op. cit*., # 630, 631. Correct speculative understanding implies knowledge of necessary truth. Correct practical understanding has to do with right ordering of practical action, and it is called prudence. Incorrect understanding implies either false science or foolish opinions.
[265] Aristotle, *De Anima*, *op. cit.*, 427b8-14.
[266] *Ibid.*, 427b14-429a9.

perception, there is no thinking without imagination. And yet it also becomes clear that imagination belongs to the internal aspect of the sensitive power. What, then, is imagination? Aristotle's analysis of imagination is composed of three parts. First, he gives a brief overview of the relationship between imagination and perceiving and thinking.[267] Second, he explains what imagination is not, and third, he explains what it is.

3.5.1. Relationship between imagination, sense perception, and thinking

Insofar as imagination belongs to the sensitive power there are similarities between imagination and perception in that both require sensation. However, there are two obvious differences. The first is that perception requires only sensation but imagination requires also perception. There is no imagination without perception because representing an image requires the capacity to bring all sensation together into one image and to differentiate between different sensible qualities. This implies that imagination can be present only in animals that are capable of perception, i.e., higher animals [cats, dogs etc.] Second, perception happens only during sensation, but imagination can also happen when perception is not active, for example, during dreaming.

Imagination is also different from thinking. but is required for thinking. It can be observed that imagination is not found without perception and judgment is not found without imagination. Thus, sensation and perception are needed for imagination; however, all three – sensation, perception, and imagination – are required for thinking. But Aristotle points out two obvious differences between thinking [reasoning and judgment] and imagination. The first is imagination's independence from the constraints of reasoning. What this means is that imagination is up to us, that is, we can form a mental image of whatever we want and whenever we want. As Aristotle expresses it: "it lies within our power whenever we wish."[268] By contrast, judgment depends on reasoning, that is, when we think and form an opinion we are not entirely free to do whatever we want, we have to reason whether our opinion is true or false. Aristotle says: "but in forming opinions we are not free: we cannot escape the alternative of falsehood or truth."[269]

The second difference concerns our responses to objects of thought and of imagination. We usually have an emotional response to something that we think or consider to be

[267] *Ibid.*, 427b20.
[268] *Ibid.*, 427b17.
[269] *Ibid.*, 427b18-20.

threatening or encouraging, but we don't have the same response and often remain unaffected if we only imagine it.[270] Nevertheless, thinking seems to involve imagination. But if thinking involves both imagination and judgment, the question is whether imagination also involves judgment. Specifically, is imagination one of the powers that have the capacity to differentiate between error and truth, such as sense, opinion, knowledge, intelligence?[271] Aristotle asks:

> "if then imagination is that in virtue of which an image arises for us, [excluding metaphorical uses of the term], is it a single faculty or disposition relative to images, in virtue of which we discriminate and are either in error or not? The faculties in virtue of which we do this are sense, opinion, science, intelligence."[272]

The question is what kind of faculty imagination is. Aristotle's approach is to look at what imagination is not, and then explain what it is. He compares imagination with sensation, knowledge, and opinion; specifically, he tests imagination against the capacity of each of these faculties to discriminate between error and truth i.e., the criterion for distinguishing between imagination and other faculties is the capacity to distinguish between truth and error. Imagination fails the test, not only because imagination can be false, but primarily because it cannot judge between truth and error. And it is the lack of this capacity to judge that distinguishes it from sensation, and from thinking as judgment [that is, knowledge and opinion]. Therefore, imagination is none of these faculties. It is worthwhile to take a brief look at Aristotle's argumentation.

3.5.2. What imagination is not

It is obvious that imagination cannot be sensation for several reasons. First, sensation is the power or activity of sensing; for example, the power of seeing or the act of seeing. But in order for sensation to happen there has to be an object of sensation [a sensible object] that affects a given sense organ and thus actualizes the power of sensation, and without an object acting upon the sense organ there is no sensation or perception. By contrast, imagination,

[270] Aristotle's point is very fine. It would seem that both thinking and imagining can produce emotional responses. However, this happens only if we have already associated the image with something that we already know represents something dreadful or pleasurable. Thus, even though the image does not affect us with same intensity, it can still produce emotions. And this depends also on a person's sensitivity.
[271] Aristotle, *De Anima*, *op. cit.*, 428a1-5.
[272] *Ibid*.

even though ultimately dependent on sensation, can happen without actual sensation, that is, without an object affecting it. Images can arise either during actual sensation but also without actual sensation, for example during sleep. Second, sensation is found in all animals, but imagination can be found only in animals that also perceive.[273] Third, and most relevant in regard to discrimination between truth and error, sensations of proper objects of each sense are always true, imagination is often false. Moreover, when we sense something, we are usually certain that we sense, and not imagine it. We may be mistaken as to whether the object is a man or a tree trunk but we are not mistaken about whether we sense it or imagine it – unless we are of course sick and/or hallucinating. In contrast to sensation, it is quite easy to imagine an object to be something else. Thus imagination is not any of the senses either potentially or actually.[274]

Neither is imagination understanding or scientific knowledge.[275] This is because simple understanding [intelligence] concerns first principles and science deals with demonstrated conclusions and these are always true.[276] Thus, knowledge means knowing the truth about something. Imagination, however, may be false.

It would seem that imagination is an opinion because opinion can also be true or false, but imagination is not opinion. The reason is that opinion is always accompanied by belief – we all like to believe in our opinions[277] – and, moreover, belief involves conviction, which itself involves reasoning. Thus opinion ultimately goes back to reasoning about what is right or wrong. Reasoning of course may be correct or incorrect.[278] If it is correct we have true knowledge or wisdom, and if it's wrong the result is false science or foolish opinion. In short, imagination is not opinion because opinion involves belief and discourse of reason. But this also explains why non-human [sentient] animals may have imagination; however, because they do not have the capacity for reasoning, they cannot have beliefs or opinion.

Furthermore, neither can imagination be a combination or blending of opinion and sensation. If, for example, you blended perception of an object and thinking, then there would be no difference between perceiving and thinking. This, however, cannot be true because opinion relies on reasoning, but sensation does not involve thinking. As stated above, opinion

[273] *Ibid.*, 428b10-17; Aquinas,*Commentary on Aristotle's De Anima*, *op. cit*., # 659.
[274] *Ibid*., # 641-645.
[275] *Ibid.,* # 639. "'understanding' means here an infallible, immediate and intuitive grasp of such intelligible objects as the first principles of knowledge; while 'scientific knowledge' means certain knowledge obtained by rational investigation."
[276] *Ibid*., # 648.
[277] *Ibid*., # 650.
[278] *Ibid*., # 630.

involves belief, conviction, and thus reasoning and judgment. This implies the possibility of error. Although sensation and perception do not involve thinking, sensation does not err as to its proper object. However, if imagination were a blend of opinion and sensation this would imply that it would never be false, which clearly is not true since imagination is often false. Therefore imagination cannot be a combination of opinion and sensation. Aristotle state: "it is clear then that imagination cannot *(25)*, again be (1) opinion *plus* sensation, or (2) opinion mediated by sensation, or (3) a blend of opinion and sensation."[279] In sum, imagination is not sensation, it is not perception, it is not speculative or practical thinking, and it is not opinion.

3.5.3. What imagination is

But if imagination is none of the above acts, what then is imagination? Aristotle first suggests that imagination is a movement that starts with and is dependent on sensation. Second, he explains how it is possible for imagination to be false. Third, he reiterates that imagination belongs to the sensitive power and is possible only in animals capable of perception. And most importantly, he stresses that, even though thinking needs images, imagination as such is not an intellectual faculty.[280]

In order to explain the movement of imagination Aristotle uses the principle of motion: "anything moved may itself move something else."[281] Basically, the act of sensation causes a certain movement. It starts when the senses are actualized by the objects of sensation. The activated senses then cause further movement which actualizes imagination to form an image. Thus, the movement of imagination ultimately starts with sensation and perception.[282]

There are several reasons imagination can be false, with the main reason being that its objects are ultimately the products of sensation and perception. Sensation is mostly correct with respect to its proper objects, that is, the qualities of things, unless, of course, there is some illness or defect to the senses [e.g., color-blindness, fever, etc.] Nevertheless, it can be mistaken with respect to common sensibles and indirect objects. And if sensation does err with respect to them, then imagination is false as well, that is, the mistakes of sensation and perception are passed on to imagination. Furthermore, imagination can be false not only during direct sensation but also when there is no direct sensation, for example, when external sense objects are absent or during sleep. Aristotle argues that since all mistakes of

[279] Aristotle, *De Anima*, *op. cit.*, 428a24-26.
[280] *Ibid.*, 428b10-17.
[281] Aristotle, *Physics*, *op. cit.*, VIII, in Aquinas, *Commentary on Aristotle's De Anima*, *op. cit*., # 655.
[282] Aquinas, *Commentary on Aristotle's De Anima*, *op. cit*., # 658.

imagination can be traced back to sensation and perception, this implies that imagination is indeed a movement that start with senses that have been actualized by their objects.[283]

Finally, only animals that are capable of sensation have imagination. Moreover, because the images are stored in ["dwell within"[284]] the imagination, they can affect the behavior of animals unexpectedly. This is true specifically in regard to non-human animals and is due to their lack of intellectual faculty. In contrast to non-human animals, human behavior is not affected by the images in the same way. This is precisely because humans have the intellectual faculty which makes it possible to control their behavior.[285]

In sum, Aristotle argues that although the movement of imagination starts with and is rooted in sensation, it is neither sensation nor perception. Moreover, although imagination is necessary for thinking, it does not belong to the intellectual faculty. He then examines the nature of imagination, namely, why imagination is not sensation or perception, but neither is it science, opinion, or belief. Imagination is not sensation because the latter is dependent on the action of sensible object on the sense organ, it exists in all animals, and even if it can be mistaken as to the indirect object of sensation, it is true with regard to its proper object except in a case of sensitive power being damaged [e.g., visual or hearing apparatus being damaged]. However, imagination can be true or false because it ultimately relies for its information on sensation and perception and also it is already removed from a direct sensory input. Moreover, whereas sensation is entirely dependent on action of the sensible object [is passive], imagining can happen 'at will'. Nonetheless, imagining affects emotions and behaviour, which is especially true of non-rational animals or of humans whose imagination is for some reason not governed by the intellect if, for example, they are controlled by some passion, are mentally unstable, or simply sleeping or dreaming.[286]

Neither is imagination science or understanding, nor is it opinion or belief. The main criterion for distinguishing imagination from intellectual activity is that even though imagination can be false or true, its falsity or truth are not based on reasoning.[287] Opinion and belief can also be false or true, however they also based on reasoning which can be true or false.

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[283] Aristotle, *De Anima, op. cit.,* 428b17-429a2.
[284] Aquinas, *Commentary on Aristotle's De Anima*, *op. cit*., # 669.
[285] Aristotle, *De Anima, op. cit.,* 429a4-9; Aquinas, *Commentary on Aristotle's De Anima, op. cit*., # 658
[286] Aquinas, *Commentary on Aristotle's De Anima*, *op. cit*., # 669.
[287] Ibid., # 648.

3.6. Concluding thoughts

This chapter has been devoted to Aristotle's analysis of the sensitive power, which includes sensation, perception, common sense, and imagination. I want to underline the incredible depth of his analysis. It must be stressed that his analysis of the power of sensation is, first and foremost, an analysis of the possibility of sensation – that is, what make sensation, perception, and imagination possible, how they are similar and different from each other. Aristotle explains how each successive act depends and builds upon the previous one: sensation depends on an object acting upon the sense, perception depends on sensation when it unifies different sensations into an object, and imagination depends on sensation and perception.

Sensation and perception involve change. Thus, insofar as the concepts of potentiality and actuality are fundamental principles of the possibility of change, they provide the ultimate explanation of the possibility of sensation and perception. As I discuss in the next chapter, they also provide the explanation of intellectual knowing and the intellect's capacity to know all things.

CHAPTER 4
ARISTOTLE AND AQUINAS ON THE INTELLECT

As discussed in an earlier chapter, the soul was understood by the early Greek philosophers as the principle of life. To recapitulate, since the two most obvious and observable characteristics of life are movement [e.g., local motion, growth] and knowing [sensing and thinking], Aristotle's predecessors had two main notions of the soul as the principle of life: 1) as the principle of motion, and 2) as the principle of knowledge. The first uses motion as a property of physical bodies to claim that since the soul is the principle of movement in living things, it must be a physical body. The second uses the principle "like can be known only by the like" to argue that the soul can know things because it is made up of the same elements as the rest of the universe. Aristotle agrees that the soul is the principle of motion and the principle of knowledge; however, he disagrees with their explanations because not only are they reductionist[288] but, most importantly, they fail to explain life.[289] For Aristotle, neither physical motion nor similarity of composition is able to explain the complexity of vital operations from the most fundamental, such as the capacity for nourishment, to the most advanced, such as intellectual activity. The real question is how the soul can be these principles. What is it about the soul that makes it capable of moving the body? How is the soul the principle of knowledge – how does the soul know? Aristotle's definition and analysis of the soul is his solution to the reductive approaches of his predecessors.

Following in Aristotle's footsteps, Aquinas takes up the question of the soul in several of his works: *Summa contra Gentiles*, *Summa Theologiae*, *Commentary on Aristotle's De Anima, On Being and Essence*, and *On the Unity of the Intellect* to name just a few. He relies to a large degree on Aristotle's analysis but not only does he distill the problems to their quintessence, he also provides a different perspective. If Aristotle's *De Anima* is about the soul as the principle of life in all living things, and how its powers manifest in three fundamental modes of life,[290] Aquinas' primary focus is the intellective soul as the principle

[288] Aristotle, *De Anima, op. cit.*, Bk. I, Ch.2. Aquinas, *Commentary on De Anima, op. cit.*, # 30-52. These notions of the soul are at their core materialistic; they reduce the soul to motion [a property of matter] or physical elements.
[289] Aristotle, *De Anima, op. cit*., 409a30 – 411b30.
[290] *Ibid*., 413a10 – 414a. The three main modes of life are nutritive, sensitive, and intellective. Because the capacity for intellectual knowledge it is the highest form of life, and what distinguishes human being from non-rational animals, Aristotle's inquiry about the soul culminates in discussion of the nature of mind [nous, intellect].

of life of the human being.[291] This approach sets the tone for the entire *Treatise on Man*[292] in *Summa Theologiae*, as it gives the intellectual soul, the first act and the substantial form of the human body, a certain primacy in its relation to the body. It is important to note that Aquinas' emphasis on the primacy of the soul does not in any way mean that he ignores soul's relation to the body. Following Aristotle, he argues that just as the human being is not reducible to matter, neither is he only the soul – the human being is always the unity of body and soul.[293]

Since human soul is intellective soul, the question of the nature of the human soul is also the question of the nature of the intellect. This brings me to the central topic of this dissertation, namely, Aquinas' arguments for the immaterial character of the intellect. Insofar as many of Aquinas's arguments are rooted in Aristotle's understanding of the mind, I will begin by looking at Aristotle's concept of the intellect in *De Anima* and Aquinas' *Commentary on Aristotle's De Anima*. I will then turn to Aquinas' arguments in Question 75 of *Treatise on Man*[294] and his arguments on the immaterial nature of intellectual substances in *Summa contra Gentiles*.[295] Even though the main topic of this work is the question of the immaterial nature of human intellect, to the extent that the intellectual substance is the substantial form of a human body, I will also look at several of Aquinas' arguments on the connection of the intellectual substance to the body.[296] Nonetheless, the focus will be on Aquinas' arguments against the bodily nature of the intellect.

The basic structure of this presentation includes the following:

1. The similarities and differences between sensitive knowing and the mind [as presented by Aristotle in *De Anima*, Bk. III, Ch. 4.
2. Aristotle's concept of the intellect as 'no-thing', as analyzed by Aquinas in his *Commentary on Aristotle's De Anima*.[297]
3. Arguments for the incorporeal [immaterial] nature of the human soul in Aquinas' Treatise on Man, *Summa Theologiae* Question 75, art. 2.[298]
4. Arguments for the immaterial nature of the intellectual substances in Aquinas' *Summa Contra Gentiles*.[299]

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[291] Aquinas, *Summa Theologiae, op.* cit., Q75. Aquinas will consider human nature in relation to soul, and to the body only insofar as the body has relation to the soul.
[292] *Ibid.*, Q75-92.
[293] *Ibid.*, Q76.
[294] *Idem, Summa Theologiae, op. cit.*, Q75, A2.
[295] *Idem, Summa contra Gentiles – Book Two: Creation,* Notre Dame, 1975.
[296] *Ibid.*, Chs. 56, 69.
[297] *Idem, Commentary on Aristotle's De Anima*, *op. cit*., # 680.
[298] *Idem, Summa Theologiae, op. cit.*, Q75, A1-A2.
[299] *Idem, Summa contra Gentiles – Book Two: Creation, op. cit*., Chs. 49-52.

5. Arguments for the intellectual substance being connected to a body as its substantial form.

4.1. Aristotle on the nature of the intellect

Insofar as Aristotle explains the intellect through the analogy between sensation and intellect, I will focus on the similarities and differences between them and his concept of the intellect as "no-thing". This will lead me directly to Aquinas' commentary on Aristotle's concept of the mind.[300] In the words of Aristotle, mind is "the part of the soul with which the soul knows and thinks."[301] Interestingly, it is this key characteristic of the intellect that becomes the central feature of arguments for the immaterial nature of the human intellect throughout history as well as in present times.

The operations of the intellect have certain definite characteristics; specifically, they deal with the concepts that transcend the particularity of objects as well as the particularity of their location in space and time. The intellect grasps essences of the real object in concepts, it pronounces judgment on the relation between them, and reasons about them. Moreover, it thinks about its concepts, and reflects and judges upon its own judging and reasoning. That is, the intellect not only thinks about objects[302] but it thinks about its own thinking – it is self-reflexive. This distinctiveness and uniqueness of the intellectual operations raise questions about the nature of the intellect, and of the possibility of the intellectual operation at all. These are exactly the problems that govern Aristotle's analysis of the mind.[303] At the beginning of his analysis of the mind, Aristotle asks two questions. First, given the specific activity of the intellect, is it a separate power of the soul? And if it is, what differentiates it from other powers? Second, how is thinking possible? How can the intellect think, what is it about the intellect that makes thinking possible?

[300] I will focus on the question of the passive mind in *De Anima*, *op. cit.*, 429a10-430a9.
[301] *Ibid*., 429a10-13.
[302] The intellect deals with both real and mental objects. In this work I assume the epistemological realism of Aquinas, i.e., that our intellect knows reality. Our concepts are representations of real objects. The concepts are that by which the intellect knows real objects. That is, not only does the intellect know the ideas but it knows the real objects.
[303] In discussing Aristotle I will use the term mind and intellect interchangeably; nonetheless, the terms mind and mental refer to the intellect and its operation, that is, thinking and understanding, and specifically to the three intellectual acts of simple apprehension and concept formation, judging, and reasoning. When discussing Aquinas I will use exclusively the term intellect.

Ancient materialist philosophers identified thinking with sense-perception but Aristotle argues that similarity of elements is inadequate to explain sense-perception.[304] His own explanation is based on the concept of potentiality and actuality. As explained earlier, the change that accompanies sense-perception is possible because of the subject's potentiality to be affected by the object. It is the realization of a subject's potentiality to sense and requires participation of both the external sense organs and internal senses.[305] It involves receiving qualities through external sense organs, and then bringing them together and differentiating between them, which is accomplished by the internal senses. In short, sensation and perception are highly complex processes that involve reception and appropriation of the object but without the object's matter.

Now, if there is any likeness between thinking and sense-perception, what exactly is it? Aristotle uses the analogy between sense-perception and the intellect to show the similarities but, primarily, to underline the differences between the two activities. His method of analysis, in which the proper object points to the vital activity, which in turn reveals the power that makes this activity possible, helps explain the differences between the respective powers. At the end of the analysis it is clear that the sensitive faculty is *not* the same as the intellect.

4.1.1. Similarities and differences between the sensitive faculty and the intellect

The main similarities between sense-perception and thinking regard 1] their respective proper objects, 2] the manner in which the objects are received by the respective faculties, and 3] their being – both are potentialities to receive their respective objects. Each similarity also brings out the differences. This highlights the distinctions both in their nature and in their relation to the body; specifically, it accentuates the total dependence on the body of the sensitive faculty *versus* the intellect's immaterial essence.

First, both faculties are similar in that they have their respective *proper objects*. Just as the senses [both external and internal] have their proper objects[306] – the sensible form – the intellect has its own proper object, the intelligible form. But their respective objects are essentially different: the sensible form is particular, the intelligible form is universal.

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[304] I will use term sense-perception for the sake of convenience. Even though sensation is different from perception in their exact activities, they both belong to the sensitive faculty.

[305] W. Wallace, *The Modeling of Nature, op. cit.*, p. 120-123. In modern terms, sensation and perception involve changes on the physical and physiological levels [changes in sense organs, nervous system, and brain] and psychological levels.

[306] For example, for the external sense of hearing it is sound. For the internal central sense the proper object includes different sense qualities.

Second, there is a similarity in the *manner* in which the objects are received by the respective faculty. Just as the object of sense-perception is appropriated by the sensitive faculty without its matter [that is, what is appropriated is the sensible form], similarly, the object of the intellect is appropriated without the matter but only its intelligible form. Thus, in both cases, what is appropriated by each faculty is the form of an object. However, their respective forms are essentially different. In the case of the sensitive faculty it is a sensible form of a particular physical object. This form is particular because, even though it has been separated from the external physical object, it still has physical qualities, that is, it has not been entirely separated from the particularity of the physical object.[307] In contrast to the sensible form [which is still associated with matter by virtue of its being the form of a particular object], the intelligible form is entirely separated from any particular character of an individual material object. The reason is that, in order to be received by the mind, the form of a physical object must be stripped of any material entanglement. As Aristotle says: "while they will not have the mind in them [for mind is the potentiality of them only in so far as they are capable of being disengaged from matter] mind may yet be thinkable."[308]

Third, both faculties are *potentialities* to receive their proper objects. Just as the senses, in receiving their proper objects, in a way become the objects, so does the intellect become its proper object. But again, their respective potentialities differ, which in turn reveals their different natures. The potentiality of the sensitive faculty is actualized by appropriating the sensible form of the physical object. For example, the potentiality to hear or see is actualized in the act of hearing the sound or seeing the object. In animals that are capable of perception this results in forming an image which can be stored in memory and recalled at a later time. In the case of the human intellect, the potentiality to think [to form a concept and then to judge and reason] is actualized by receiving and appropriating the intelligible form of an object. In short, both the sensitive faculty and the intellect receive their objects without matter. Each faculty is potentially identical in character with its object but without being the physical object, that is, it becomes an object without material component.

Nonetheless, there are key differences in the potentialities of the sensitive faculty and the intellect. Even though both the senses and the intellect receive the form of the object without its material component, the immateriality of the received form is different. As indicated above, the form that can be appropriated by the intellect must be stripped of all

[307] In modern terminology we would say that the appropriation of the sensible form by the sensitive faculty broadly refers to all physical and physiological changes in sense-organs, the nervous system, and the brain that are caused by the qualities of physical objects.
[308] Aristotle, *De Anima*, *op. cit*., 430a5.

individual characteristics of the sensible form of the concrete object. The main reason for this difference is that the intellect is not limited in its potentiality to know, whereas the senses are limited to knowing only the objects of sensation. Even if these include all possible objects of sensation [proper, indirect, and incidental objects of sensation], sensation is ultimately locked within the physical world. This is further attested to by the limitations in its capacity to receive sensation. As Aristotle points out, any extreme objects of sensation can cause severe damage or even destruction to the senses. For example, severe light can cause damage to sight, and severe burn to the capacity to feel touch.

In sharp contrast to this limitation of the sensitive faculty, the intellect's capacity to understand increases with appropriation of increasingly difficult concepts, i.e., understanding difficult things makes it easier to understand even more difficult things. This difference shows that sensation is dependent upon the body but mind is separable from it.[309] Nevertheless, Aristotle adds that, insofar as the intellect's activity presupposes sensation, an injury to an organ of the body may indirectly weaken the intellect.[310]

Furthermore, in contrast to sensation, the intellect has the capacity to know all, that is, everything can become the object of the intellectual knowledge. This capacity extends to the intellect *itself* since the intellect itself can be the object of its own thinking.[311] To clarify this point Aristotle recalls the analogy with knowledge. Just as the person who possesses knowledge is in potentiality to act on it, similarly the intellect, once it has become its possible objects of thought – i.e., has acquired knowledge – is still in potentiality to think, but this time to think about itself. In other words, the intellect that has formed its first concepts can think about its own thinking, that is, form concepts of concepts, and reflect about its judging and reasoning. Examples of this potentiality to think about thinking include logical reasoning and self-reflection.

Another crucial difference between sense-perception and thinking is in their objects and kind of knowledge. If the sensitive faculty knows only the particular things, the intellect grasps the essence of a thing.[312] The sensitive faculty can determine that something is this or that thing, for example a tree, water, or red rose, but it does not understand what it is to be the

[309] *Ibid.*, 429a30.
[310] Aquinas, *Commentary on Aristotle's De Anima*, *op. cit.*, # 688. This also shows that a human being is a unity of body and soul. In this present state of life, inasmuch as the intellect needs images/phantasms for its operation, there is dependence of the intellect upon the body, or more precisely on sensitive knowing. This implies that damage or change to any external or internal sense [any organ dealing with sense-perception] will affect the operation of the intellect.
[311] Aristotle, *De Anima*, *op. cit.*, 429b5.
[312] *Ibid.*, 429b15.

tree or water or rose. There is a clear difference between *knowing that* something is and *knowing what* it is to be that thing – the difference between knowing a thing and knowing its essence.[313] The latter is understood only by the intellect.

In summary, to the question of whether sense-perception and thinking are the same vital activities, Aristotle responds that they are different. This is attested to by the difference in their respective objects and operations. The objects of sense-perception are only and always sensible objects and forms. The objects of intellection are only and always intelligible forms. The potentiality of the sensitive faculty to appropriate its objects is limited to the physical world. If sense-perception is always about particular individuals, the potentiality of the intellect extends to the possibility of knowing all objects. Everything can become a possible object of thought, and this includes the intellect itself. However, in order to become the objects of intellectual knowledge, the objects must be stripped of all sensible characteristics of the concrete things. Thus, the difference in their objects and their potentialities reveal the essential difference between the two faculties. In contrast to sense-perception, which is not only dependent on but entirely locked within physical reality, the intellect transcends the particularity of physical reality. Its proper object is the universal, immaterial, atemporal, and unchanging form of an object.

4.1.2. The question of the nature of the intellect

The question about the nature of the intellect involves two related questions: how can thinking happen? and what must the intellect be so that it can know all things? Aristotle's answer is based on two key ideas: the notion of potency and act, and the indefinite being of the potential intellect. The intellect as the potentiality to know all things has no definite being of its own.

Before presenting his own solution Aristotle addresses the typical problems raised in regard to knowing. If all that is possibly thinkable can become the object of the intellect, this would supposedly require that the intellect and its possible objects must be the same [a materialist position]. Now, this may suggest that: a] the mind belongs to everything, i.e., all intelligible things are also intelligent;[314] or b] the mind and all other thinkable realities contain some common element. Aristotle argues against both of these positions. And this is precisely

[313] The intellect's capacity to grasp the essence of things has to do with the intellectual operation of abstraction.
[314] Aquinas, *Commentary on Aristotle's De Anima*, *op. cit.*, 720-721.

where his notion of potentiality and actuality not only offers an amazing insight but also solves the problem. First, in order for the intellect to know all things, it does not have to belong to all things because the intellect is *no-thing*, that is, it has no actual being until it had already thought. Nonetheless, potentially the intellect is all things that can become its objects. That is, all that is thinkable can become the object of the intellect but the intellect has no actual being until it receives and becomes its objects – *the intellect is actualized by thinking*. The intellect is like a tablet on which nothing actually has been written.[315] In Aristotle's words: "what it thinks must be in it just as characters may be said to be on a writing-tablet on which as yet nothing actually stands written."[316]

The answer to the second problem is that the intellect and the objects of thought do not have to have a common element [something that connects the intellect and its objects] because the intellect *is* its objects. The intellect is not actualized – it is only potentiality – and thus it has *no* real being until it appropriates and becomes its object. In other words, the intellect has no actual knowledge of a thing until it understands it.

Aristotle's answer brings up another point, namely the nature of objects that can become the intellect. Since the act of understanding means that the intellect becomes its object, clearly, only objects that have been separated from their material components [their particularity] can become the intellect. Thus the speculative knowledge and its objects are identical, that is, the intellect is its concepts. It is identical to what it knows. Aristotle writes that: "in case of objects which involve no matter, what thinks and what is thought is identical."[317]

The situation of the objects that have not been separated entirely from matter [sensible forms] is different – they are only objects of thought potentially. Since they are not separated from matter, they are only in potentiality to become identical with the intellect. Thus to become the actual objects of thought they have to be separated from matter. According to Aristotle: "while they will not have the mind in them (for mind is the potentiality of them only in so far as they are capable of being disengaged from matter] mind may be

[315] The idea that the intellect is no-thing until it is actualized by thinking becomes a point of contention for some commentators [e.g., Averroes]. They argue that since the intellect is no-thing, there is no intellect unless there is thinking happening. However, the notion of potentiality solves this problem. The intellect is potentially at all times, that is, it has no actual being, but this does not mean it has no being at all. It means that it has not any definite being as this or that.
[316] Aristotle, *De Anima*, *op. cit*., 429b30.
[317] *Ibid*., 430a.

thinkable;"[318] and, very importantly, "the mind is itself thinkable in exactly the same way as its objects are."[319]

In short, it is precisely because the intellect is its knowledge potentially, in order to be actualized, that is to know, it does not have to belong to everything or have any common elements with things. When something becomes the object of the intellect, the intellect and its object are identical.

The next question then is, what must the intellect be so that it can know all things? What must its nature be to know *all* sensible things? To explain this special capacity of the intellect, Aristotle offers a truly innovative solution that uses both the concept of *potentiality* and the *indefinite nature* of the intellect. Aristotle argues that, to the extent that everything can be a possible object of thought, the intellect must be capable of receiving all possible objects of thought. But if the intellect is potentially all possible objects of thought, it cannot be actually any real thing.[320] If the intellect were an actual or real thing then it would have its own definite nature. It would not be capable of receiving [and becoming] all possible objects of thought, i.e., it could not think all that is possibly thinkable. Aristotle argues:

> "since everything is a possible object of thought, the mind, in order ... to know, must be pure from all admixture; for the co-presence of what is alien to its nature is hindrance and a block…it too, like the sensitive part, can have no nature of its own, other than that of having a certain capacity…thus that in the soul which is called mind [by mind I mean that whereby the soul thinks and judges] is, before it thinks, not actually any real thing."[321]

In short, the intellect must receive its objects without matter. This is possible because the intellect is potentially identical in character with its object but without being the object [without its matter]. The intellect represents the object, which means that it takes on the form of the object. But because everything is a possible object of thought, the intellect must be capable of receiving all possible objects of thought. Therefore, it cannot be an actual or real thing such as a corporeal body because then it would have a definite nature. And having a

[318] *Ibid.*, 430a5.
[319] *Ibid.*, 430a.
[320] A thing cannot be potentially and actually at the same time and in the same respect. So if the mind is potentially all possible things, it cannot be actually some definite thing. Because this would limit its potentiality to become all possible things, to know all.
[321] Aristotle, *De Anima*, *op. cit.*, 429a20.

definite nature would limit its capacity to receive and become all possible objects of thought, i.e., to have the capacity to know all things.

This last argument brings us to Aquinas' development of Aristotle's thought on the nature of the intellect. In his analysis of the mind,[322] Aristotle focuses on the nature of the intellectual soul but primarily in regard to the possibility of knowledge. Aquinas, to a large extent, accepts Aristotle's view of the soul; however, he emphasizes the immaterial and subsistent being of the human intellectual soul.[323] To this effect, in *Summa Theologiae*[324] he argues for the immaterial and incorporeal nature of the human intellectual soul,[325] and in *Summa contra Gentiles* for the non-bodily and immaterial nature of intellectual substances[326] as well as the connection of the intellectual substance to a body as its substantial form.[327] Nonetheless, his arguments and explanations are designed to demonstrate the immateriality of the intellect. And to really appreciate his thinking, it seems imperative to immerse oneself in the development of his arguments, beginning with some aspects of his *Commentary on De Anima*.

4.2. Aquinas's *Commentary on Aristotle's De Anima,* iii, 4

Aquinas' commentary focuses primarily on explicating Aristotle's concept. For example, he addresses the general principle that if anything is to receive an object, there are several conditions that must be met: it must be in potency to that object, it must be able to receive it, and it itself must be without that object.[328] This concept is illustrated with the specific example of the sense of sight – we can see color because that which receives color is itself colorless.[329] *"*Thus, the pupil of the eye, being potential to colors and able to receive them, is itself colorless."[330] Moreover, *"*since it [the intellect] naturally understands all sensible and bodily things, it must be lacking in every bodily nature; just as the sense of sight, being able to know color, lacks all color."[331]

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[322] *Ibid.*, 429a10 – 430b9.
[323] Aquinas, *Commentary on Aristotle's De Anima*, *op. cit*., # 680; Aquinas, *Summa Theologiae*, *op. cit.*, Q75, A1-A2; Aquinas, *Summa Contra Gentiles – Book Two: Creation*, *op. cit*., Chs. 49-52.
[324] Aquinas, *Summa Theologiae*, *op. cit.*, Q75, A1-A2.
[325] *Ibid*.
[326] *Idem*, *Summa contra Gentiles – Book Two: Creation*, *op. cit*., Chs. 49-52.
[327] *Ibid.*, Chs. 56, 69.
[328] *Idem*, *Commentary on Aristotle's De Anima*, *op. cit*., # 680.
[329] Interestingly enough, the photoreceptor cells on the retina are affected by certain wavelengths of light. The main protein opsin responsible for color vision is colorless.
[330] Aquinas, *Commentary on Aristotle's De Anima*, *op. cit*., # 680.
[331] *Ibid*.

Aquinas further explains this by arguing the contrary [by showing the consequence of the opposite scenario], and continuing use of the analogy between the sense faculty and the intellect. As he says:

> "if sight had any particular color, this color would prevent it from seeing other colors, just as the tongue of feverish man, being coated with a bitter moisture, cannot taste anything sweet. In the same way, if the intellect were restricted to any particular nature, this connatural restriction would prevent it from knowing other natures."[332]

If a given sense already had [were] the nature of one of its proper objects, then it would not be able to sense all of its other objects – it would be 'colored' by that object, so to speak. For example, if all photoreceptor cells in the eye's retina could only receive light of one wavelength, this would make it impossible to receive all wavelengths of light and make it impossible to see all colors.[333] By analogy, if the intellect had any sensible nature, this would mean it would be restricted to that particular nature. This particular nature would become its nature; and being so restricted would prevent the intellect from knowing all other natures.

Clearly, this argument is rooted in the idea that all physical bodies have natures, that is, there is no such thing as a formless physical body. Every corporeal body is already defined as such a body. Moreover, the particular nature of a physical body restricts its potency to have another nature. That is, being one particular physical body excludes the possibility of its being another particular physical body at the same time and in the same respect.[334] Now, if we extend this idea to the intellect, that is, if the intellect has any sensible nature, this means it has a particular nature. Thus the intellect would be limited to having that particular corporeal nature. But having this particular nature would restrict its capability to be affected by other natures.

This leads to the obvious question of what the intellect must be in order to be capable of receiving all sensible objects. As explained earlier, Aristotle concludes that the intellect must be *'no-thing'*. However, Aquinas further explains that this does *not* mean that Aristotle says that the intellect has no nature at all, but insofar as it is capable of knowing, its nature is that it

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[332] *Ibid*.

[333] The photoreceptor cells in the retina of an eye, via the complex process of photochemical reactions, are capable of receiving and processing light of different wavelengths.

[334] For example, having the nature of a rabbit excludes the possibility of its being a wolf. If the rabbit gets eaten by a wolf, the being of a rabbit as this particular animal ceases to be, that is, its substantial form becomes substantial forms of food that fattens the wolf. It becomes incorporated [as the accidental form of fat] to the substance of the wolf.

is open to all things. Moreover, the '*openness'* of the intellect to its objects is radical compared to the receptivity of any given sense [sight or hearing] to its objects. As already mentioned, in order for the sense of sight to see color, it must be free from all color.[335] This means that is free from [it lacks] only one sensible quality – color. In contrast to any of the particular senses, the intellect, in order to be capable of understanding all sensible qualities, must be free from *all* sensible natures.

Furthermore, the obvious inference is that the intellect has no bodily organ. The intellect's universal capacity for knowledge, i.e., its capability to know all things, requires not only that it must be free from every corporeal nature but also that the intellect does not have a bodily organ. If the intellect did have a bodily organ like a sensitive part does, it would be like another sense organ – it would be affected like a sense organ and have a definite sensible quality to it.

In sum, Aquinas crystalizes Aristotle's argument about the nature of the intellect, that is, what the intellect must be so that it is capable of knowing all sensible things. Two ideas stand out in both of their arguments: first, the intellect is the potency to know all sensible things; and second, in order to know all sensible things, the intellect must be free of all sensible natures and it cannot be a bodily organ. Thus, the intellect is no-thing which means its nature is *openness* to all things. And any physical nature, insofar as it is restrictive due to its physical properties, would make it impossible for the intellect to be capable of knowing all things. This argument will find its complement in *Summa Theologiae*, Q75, A2.

4.3. Aquinas' approach in the *Summa Theologiae*

Aquinas begins his analysis in *Treatise on Man*[336] with the question of the essence of the soul, then the soul's powers and its operations. He introduces impressive order and clarity to Aristotle's arguments and refines his concept of the human soul. His method of argumentation in the *Summa Theologiae*[337] follows a strict pattern. First, he states the question to be discussed. Second, he brings up several possible objections to the question. Third, he presents a traditionally accepted counter argument, typically Theologiae, to the objections. Fourth, in his *Respondeo*, he gives his own answer to the problem. Finally, he responds to the objections while further developing his arguments. I will discuss only

[335] Put in modern terms, it must not be restricted to absorbing only one wavelength.
[336] Aquinas, *Summa Theologiae*, *op. cit*., Q 75-102.
[337] *Ibid*.

arguments in Question 75, Art. 2, "Whether the Human Soul Is Something Subsistent?",[338] because they are pertinent to the question of the nature of the human intellectual soul.

Aquinas' goal in Article 2 is to prove that the human soul is subsistent, i.e., that its being is not dependent on the body. But inasmuch as the human soul is the intellectual substantial form of human body, the question of the subsistent nature of the human soul is also the question of the nature of the intellect. In my explication, I will vary the order of Aquinas' argument by starting with his *Respondeo* because it complements his commentary on DA, iii, 4. As I follow his arguments I will highlight the principles and ideas.[339]

The argument of Aquinas' *Respondeo* builds on Aristotle's argument in De Anima, iii, 4; however, its goal is somewhat different. Aristotle is primarily interested in the nature of the intellect with regard to knowing. In order to be capable of knowing all sensible things, the intellect must be free of all sensible natures – the intellect is *openness* to all things. Aquinas emphasizes the immaterial nature of the intellect in order to show that human intellectual soul is incorporeal and subsistent. To this effect, following Aristotle, he argues that the intellect cannot contain any bodily nature as that would limit its natural capability to know all things, thus it is immaterial. Neither can the intellect be a body as that would also limit its knowing. The intellect is immaterial, incorporeal, and does not depend on the body for its operation of understanding. And since only that which subsists acts, the intellect is subsistent.[340]

Aquinas begins his argument by asserting that the soul as the principle of intellection must be both incorporeal and subsistent. But why? Because clearly it is through the intellect that man can have knowledge of all corporeal things. It is by virtue of his intellectual capacity that man can understand what things are. Next, he uses the principle that "whatever knows certain things cannot have any of them in their nature; because that which is in it naturally would impede the knowledge of anything else"[341] to argue that the intellectual principle cannot contain the nature of a body. He also illustrates this point through an analogy with the senses. For example, when the sense organ of taste [e.g., tongue] is affected and changed by something [e.g. fever], this impedes its capability to taste other flavors. Similarly, if the intellectual principle were contained the nature of a body, this would make it unable to know all physical bodies. This is because every body has its own determinate nature. Thus, if the intellect contained the nature of a body, the determinate nature of that physical body would

[338] *Ibid.*, Q75, A2.
[339] I realize that explication of his argument will to a large extent repeat earlier ideas. I decided to include them anyway because I want to bring close attention to his arguments *per s*e.
[340] The notion of intellect immateriality becomes even more clear in *Summa contra Gentiles* in Aquinas' explanation of the connection of intellectual substance and a body.
[341] Aquinas, *Summa Theologiae*, *op. cit.*, Q75, A2.

affect the intellect and the intellect would only know the nature of a body that it contained. Consequently, it would be incapable of knowing all corporeal bodies. However, the intellect has capability to know all corporeal bodies. Thus, the intellect cannot be a body.

In the second part, Aquinas argues that neither can the intellectual principle act by means of a bodily organ. Insofar as every physical body has a determinate nature, if the intellect acted through a bodily organ then its intellectual activity would be impeded by the determinate nature of that organ. And the intellect would not be able to know all physical bodies.[342] Because the intellect can understand all corporeal bodies, its operation is not an act of a bodily organ, that is, the intellect has its own operation that is apart from the body. Since only that which subsists can have operation *per se* – "for nothing operates but what is actual",[343] the intellect must be subsistent. The intellect, or mind, is both incorporeal and subsistent.

All possible *Objections* are meant to show that the human soul cannot be anything subsistent. In his reply, Aquinas focuses primarily on clarification of the meaning of terms.

Objection 1 is based on the idea that only that which is a particular thing subsists. A particular thing is a composite of soul and body – it is not just a soul alone. Thus, because the soul is not a particular thing [a composite], the soul is not subsistent. Aquinas replies to Objection 1 by making a distinction between *two senses of 'this particular thing'*. The first sense applies to anything that is subsistent – this excludes accidents that inhere in a substance a material form. The second sense of 'this particular thing' applies to that which subsists and is *complete* in its nature. This latter sense excludes the imperfection that is implied in being a part of something. For example, a hand is 'this particular thing' in the first sense, but not in the second sense because a hand is not a complete substance. Similarly, the human soul can be called "this particular thing' in the first sense but not in the second sense – the human soul is a part of human nature but it is not a complete human nature. The human being, as the composite of body and soul, is properly called 'this particular thing'. But even though the human soul cannot be called 'this particular thing, nonetheless, as a part of human nature it is subsistent in the first sense.

Objection 2 is based on the principle that *only that which exists per se, can act*. It reports the words of Aristotle from *De Anima*, Book I – that the soul does not operate – to claim that the soul is not subsistent. In his reply to Objection 2 Aquinas first clarifies that the

[342] *Ibid*.
[343] *Ibid*.

words used by Aristotle did not express his own opinion about the soul, but the opinion of philosophers who identified understanding with motion [being moved]. Second, Aquinas totally agrees with the principle that "to operate *per se* belongs to that which exists *per se*", that is, only that which exists, acts. However, something can be said to exist as a part – if it is not inherent as an accident or is not a material form. This idea of existence of a part was used in the reply to Objection 1; however, in his reply to Objection 2, he emphasizes existence *per se* because *only that which exists per se, truly acts.* Since to exist *per se* does *not* belong to an accident or to a material form, nor to a part, it cannot be said of those things that they operate *per se*. For example, an eye by itself does not see, nor does a hand by itself feel; rather, it is a man that sees with his eyes and feels with his hand. Similarly, just as it can be said that the eye sees, so it can be said that the soul understands; nevertheless, Aquinas says that is more correct to say that it is man that understands with his soul.

Objection 3 states that for the soul to be subsistent it must have some operation apart from the body. But the soul has no operation apart from the body, because even the operation of understanding uses phantasms which are dependent on the body [sensing]. Therefore the soul is not subsistent. Aquinas' reply to Objection 3 makes a distinction between the *origin* of action and the *object* of action. The intellect needs the body but not as the origin of its action but for its object, that is, the intellect needs phantasms from which it can abstract intelligible species and these need the body to be produced [sensation and perception]. However, Aquinas points out that this kind of dependence on the body does not prove that the intellect is non-subsistent. If it did prove that, this would mean that animals also are non-subsistent [do not exist as complete natures] because animals' acts of perception are dependent on the external objects of the senses. That is, just as the intellect depends on phantasms, so the animal's act of perception depends on external object of the senses. Thus, if dependence on phantasm were to prove the non-subsistence of the intellect then dependence on external objects of the senses for perception would serve to prove the non-subsistence of animals.

The arguments in Aquinas' Commentary and in Article 2 of Questia 75 are very similar. I decided to include both of them, not just because they differ somewhat in their objective, but also because they both underline the absolute necessity for the intellect to be free of any definite material nature. In this sense, they are based on the difference between the properties of matter and physical bodies and the nature of the intellect. Insofar as physical bodies are determined by physical space, time, dimension, finitude, and corruptibility, they are always limited – that is, they are defined by physical laws. Thus, what stands out in Aquinas' (and Aristotle's) arguments is that the question about the nature of the human intellectual soul is

ultimately the question about the essential difference between the properties of material bodies and the nature of the intellect. This difference is also the foundation of his arguments for the immaterial nature of the intellectual substances in *Summa Contra Gentiles*, which is the topic of the next several sections.

4.4. *Summa contra Gentiles* on the human intellect

In *Summa Contra Gentiles,*[344] Aquinas provides a wealth of arguments on the nature of intellectual substances and thus on the nature of the human intellect. When Aquinas speaks of intellectual substances, he means all intellectual substances, that is, the purely immaterial intelligences, such as angels, and human beings which are composites of the intellectual soul and a body. However, when discussing the nature of intellectual substances, he speaks of their nature as such, regardless of whether he is considering a pure immaterial intellectual substance [an angel] or the intellectual soul of a human being; that is, he discusses the essential characteristics of an intellectual substance.

In the following sections, I will focus on the chapters that deal with immaterial substances and the connection of the immaterial substance with the body; nonetheless, to provide context, it may be worthwhile to briefly mention the general organization of this volume. Aquinas begins *Summa Contra Gentiles,* vol. 2, on *Creation* by explaining that it is necessary to study the world [created things] for two main reasons: the consideration of creation is helpful for the instruction of faith since creation reveals its Creator; and second, that learning about creation helps to correct errors about perceptions of God. First, though, Aquinas underlines the different approaches to study the universe used by a believer and a philosopher. A believer studies the universe in order to show its relation to God and argues from its first cause – God. A philosopher begins with the consideration of the world and things and argues from the causes of things.[345] Nevertheless, theology and philosophy are not in conflict. Even though theology should be considered the highest wisdom because its subject is the highest cause, theology sometimes uses the principles of philosophy and scientific knowledge to deepen its understanding of God.[346] Thus, Aquinas explains the relation of creatures to God as the source of their being. He addresses the question of distinctions between things, and argues against chance, or matter, or merits, as their source. He argues that distinctions between things are due to the act and form of their being, but ultimately it is God as the most perfect agent who is the first cause of such distinctions.[347] Moreover, distinctions between things are necessary for the order and perfection of the universe. This brings him to the question of immaterial substances and why their existence is

[344] *Idem, Summa contra Gentiles – Book Two: Creation, op. cit.*, Chs. 49-56. These chapters focus on the nature of the intellectual substance as such.
[345] *Ibid.*, Ch. 4, 2
[346] *Ibid.*, Ch. 4, 4.
[347] *Ibid.*, Ch. 45.

necessary for the perfection of the universe.[348] He then argues that intellectual substances must be endowed with will, that is the power of self-acting, and that they have freedom of choice in their acting. Most of the second half of Volume Two is spent on discussing the nature of the immaterial substances, on how the immaterial substance can be connected to the body, and on the difference between pure immaterial substances and human intellectual soul.

In *Summa contra Gentiles* Aquinas also provides a robust philosophical explanation for the essential unity of the intellectual substance and human body. He argues that the only way for the human being to be one undivided substance is that the intellectual substance *must* be connected to the human body as its substantial form. His distinction between the soul's essence and its acts is not only amazing in its sheer elegance and beauty, but also it offers a solid explanation for the unqualified unity of a human being and for the immaterial aspect of the human's intellect, and so the subsistence of the human intellectual soul.

As is to be expected of Aquinas, *Summa contra Gentiles* is extremely well organized. The ideas are meticulously developed and argued in consecutive chapters. The pattern of argumentation is similar in style to that of *Summa Theologiae* but spread out over several chapters.

1. He states the problem to be examined.
2. He cites possible objections.
3. He summarizes other views.
4. He offers his own arguments.
5. He provides his answers to objections.

Aquinas typically begins his argument by stating the principle or an idea that governs it. Although it would be an amazing feat to study all of his arguments and reflect on all the principles, this is be beyond the scope of this project. In the following sections I will deal with two main issues: Aquinas' arguments for the immateriality of intellectual substances,[349] and second, his arguments on how intellectual substance is connected to the body.[350] The flow of his arguments is organized so as to reveal gradually the immaterial nature of intellectual substances. This is beautifully exemplified in his discussion of the nature of the intellectual substance: first, he shows that intellectual substance is not a body; next, that it cannot be the composite of form and body; and then that it cannot be the material form. He then deals with

[348] There is a good reason Aquinas is called the "Angelic Doctor". For Aquinas, the universe is populated with infinite number of immaterial substances. Moreover, their existence in the universe is needed and required for the order and completeness of the created universe.
[349] Aquinas, *Summa Contra Gentiles – Book Two: Creation*, *op. cit*., Chs. 49-51.
[350] *Ibid.*, Chs. 56, 68, 69.

metaphysical questions about intellectual substances, namely, the distinction between essence and being,[351] the distinction between act and potency, and the difference between substance and being *versus* matter and form. This leads to the arguments for the incorruptibility of intellectual substances. I will not discuss the latter chapters, but will focus solely on Aquinas' arguments against the bodily or material character of intellectual substances.[352] Aquinas' arguments are very clear and succinct, but it does not mean that they can always be understood without difficulty. In my explication, I hope to bring out their enduring strength by focusing on their fundamental principles.

4.4.1. The intellectual substance is not a body

Aquinas devotes several chapters of *Summa contra Gentiles*[353] to explain the nature of intellectual substances. In Ch. 49 alone, he gives ten arguments that the intellectual substance is not a body. Because the first paragraph of each chapter is usually the statement of what is to be proved, the following paragraphs can be thought of as premises in a long argument or as separate arguments. I will adopt the latter option, but I will not discuss the last two arguments of Ch. 49 because they are primarily Theologiae.

The *first* argument is based on the difference in the way the body and the intellect *contain* things. The physical body can contain another physical body if there is correspondence or proportion of size or quantity between them, i.e., by 'quantitative commensuration'. In contrast, the intellect understands things by its whole self regardless of their size or quantity. In other words, the capacity of the body to contain another body is always limited by its physical attributes [size or quantity, etc.] The intellect is not quantitatively limited in its comprehension. It grasps things with its entire self and it understands them regardless of their size or quantity. Since the intellect's capacity to contain and so comprehend things is not restricted by itself or by the quantitative aspect of things, the intellect is *not* a body.

Aquinas' *second* argument is based on the difference in the way forms are *received* by the body and the intellect. The reception of a new substantial form by the body involves the destruction of its former form in favor of the new one, that is, the body cannot receive another substantial form without corruption of the previous one – "No physical body can receive the

[351] *Ibid.*, Chs. 52-55.
[352] *Ibid.*, Chs. 49-51.
[353] *Ibid.*, Ch. 49.

substantial form of another body, unless by corruption it loses its own."[354] For example, as wood becomes ashes, the form of the wood is destroyed in favor of the new substantial form of ashes. This is in total contrast to the way the intellect receives forms. The intellect becomes the forms of things it understands – *"...*it understands by having in itself the forms of the things understood*..."*[355] Moreover, the intellect is not destroyed by the forms of things it receives and appropriates; rather, it is perfected by them. The more forms it appropriates and so the more it understands, the more its knowledge increases. Aquinas says: "The intellect is not corrupted; rather it is perfected upon receiving the forms of all bodies: for it is perfected by understanding, and it understands by having in itself the forms of all the things understood."[356]The difference in the way forms of things are received in the body and the intellect is due to the limited and corruptible nature of the physical body and the unrestricted capacity of the intellect to receive forms. The more the intellect understands, the more perfect is its knowledge. Thus, the intellectual substance is not a body.

The *third* argument[357] uses the difference in their being as principles; matter is the *principle of differentiation* within species, and the intellect is the *principle of understanding*. This difference is based on the different ways matter and intellect receive and possess forms, which, in turn, is rooted in the difference between the properties of matter such as divisibility and quantifiability *versus* the nature of intellect. Aquinas starts his argument by stating the observable fact that matter is the principle of differentiation within species. This is because matter receives and possesses forms as individuated, which in turn is possible because of its quantifiable and thus divisible nature. For example, the form of one fire does not differ from that of another fire. It only differs as it is received into different parts of matter. Thus, as they are received by matter forms are *individuated* – form becomes a form of this or that particular thing. Like matter, the intellect also receives and possesses forms of things. But the intellect is the principle of understanding. The key to the argument is, *"*But the intellect understands things by those forms of theirs which it has in its possession."[358] If the intellect understands things by those forms of things that it possesses, then, if the intellect were the body, it would appropriate and understand only forms as individuated. This is clearly not true because the intellect understands *universals*. Therefore, intellect is not a body.

[354] *Ibid.*, Ch. 49, 3.
[355] *Ibid*.
[356] *Ibid.*
[357] *Ibid.*, Ch. 49, 4.
[358] *Ibid.*

Aquinas' *fourth* argument[359] is based on the principle that *form is the principle of action*. The action of the intellect is to understand. If the form of the intellect were a body, then, by the principle that *action follows form*, the intellect would understand only bodies. But the intellect knows more than bodies since it understands universal ideas – it understands not only that something is but also what it is – and, moreover, it goes beyond bodies to understand mathematical equations. Again, the intellect is not a body.

The *fifth* argument is quite fun. Aquinas briefly states the problem. If intelligent substance is a body, it is either finite or infinite. But a body cannot be infinite,[360] so if anything is a physical body it must be finite. Moreover, infinite power cannot exist in a finite body.[361] So if the intellect were a physical body it would have to be finite. However, the intellect is infinite because its cognitive power is in a certain sense infinite – its knowledge is always expanding. For example, by adding numbers to numbers its knowledge of species of numbers is infinitely extended, the same goes for its knowledge of species of figures and proportions. Moreover, the intellect is infinite because it knows the universal which is, in a sense, infinite because it contains individuals which are potentially infinite in number. In short, if the intellect were a body, it would have to be finite.[362] However, the intellect is in

[359] *Ibid.*, Ch. 49, 5
[360] *Ibid.*, Ch. 49, 6
[361] *Ibid*; *Idem*, *Summa Contra Gentiles – Book One: God,* Notre Dame, 1975, Ch. 20.
[362] see M. J. Dodds, *The Philosophy of Nature, op. cit.*, Ch. 10. He looks at two main kinds of infinity: infinity in mathematics and infinity in physics. A**.** Mathematical infinity is infinity associated with potency. Mathematical quantity is infinite through division or addition: 1] infinite division of continuous quantity, or 2] infinite series of natural numbers. If we divide a line into segments, the part divided is in act, that is, it is actually divided, but the line or segment can be divided again and again, that is, there is potency for them to be divided again. The same is true for addition of numbers – infinity means that one more number can be added to the numbers that are in act/actual. The series remains open. In short, mathematical infinity in potency means that there is always a possibility for further division which can never be transformed into act and the potentiality of adding another number to already existing/counted numbers. B. Infinity in physics means that no body can be infinite**.** According to Aristotle, a body cannot be split infinitely because this will result in its losing its substantial form as the new form emerges. The reason is that the substantial form determines the body's being as the specific kind of being which also includes its accidents [accidental properties, including size]. "Now it is manifest that a natural body cannot be actually infinite. For every natural body has some determined substantial form. Since therefore, the accidents follow upon the substantial form, it is necessary that determinate accidents should follow upon a determinate form; and among these accidents is quantity. So every natural body has a greater or smaller determinate quantity. Hence it is impossible for a natural body to be infinite" [p. 175-176]. For example, a molecule of water splits into oxygen and hydrogen. This involves destruction of one substantial form of water, and emergence of two new forms: oxygen and hydrogen. Furthermore, the physical body cannot be infinite because: 1] the body cannot be infinitely increased in size; and 2] the body cannot be infinitely divided into smaller and smaller parts. For example, particles cannot be infinitely divided because to break them up requires enormous amounts of energy as well as other particles. The kinetic energy of splitting particles is so high that the same particles tend to reform.

some sense infinite since its knowledge can extend to infinity; hence the intellect cannot be a body.

The *sixth* argument is based on the *spatiality* of matter *versus* the *non-spatial* character of the intellect. Two physical bodies cannot contain one another unless there is a difference in size between them. But there is no spatial restriction in the case of intellect. If one intellect knows another they contain and encompass one another. This non-spatiality of the intellect shows that intellect is not a body.

Aquinas' *seventh* argument focuses on the *self-reflexive* capacity of the intellect. The body cannot move itself and, if it does move, it happens when one part moves another. In contrast to the body, the intellect reflects on [moves] itself, and does it not only with regard to its actions but also in regard to itself. The intellect reflects about itself. Thus, no intellect is a body.

Finally, the *eigth* argument against the intellectual substance being a body is based on the difference in *directedness* or conscious *purposiveness* of action. The physical body has no awareness of itself or of its action – a body does not know why it acts. In contrast, the action of the intellectual substance terminates in action, that is, the intellectual substance knows that it acts and why it acts. Not only does it know but it also knows that it knows, and this allows it to act upon reflection about its actions. Once again, the intellect cannot be a body.

I realize this explanation is fairly detailed, but before discounting Aquinas' arguments about the nature of intellectual substances, it is crucial to understand the principles and ideas upon which they based. As we can see, not only are they not absurd or esoteric, but they agree with our experience. Moreover, they provide a richer background for the understanding of many scientific pronouncements.

4.4.2. Intellectual substances are immaterial

In Ch. 50 of *Summa contra Gentiles* Aquinas argues that intellectual substances cannot be composed of matter and form, i.e., that they are immaterial.[363]

His *first* argument uses the *notion of the body* as that which is composed of matter and form. This notion of the body is rooted in the quantitative and thus divisible nature of matter. Aquinas says: *"*For everything composed of matter and form is a body since matter cannot receive diverse forms except with respect to its various parts."[364] But since an intelligent

[363] Aquinas, *Summa Contra Gentiles – Book Two: Creation, op. cit*., Ch. 50.
[364] *Ibid.*, Ch. 50, 2.

substance is a not a body, as shown in the previous section, it is not composed of matter and form, and so is immaterial.

The *second* argument is based on the *difference in the mode of existence* of things that are composed of form and matter [as individuals] *versus* the mode of existence of forms in the intellect [as universals]. Aquinas argues that: "just as man does not exist apart from this man, so matter does not exist apart from this matter."[365] A subsistent thing that is composed of matter and form always exists as individual matter and form.[366] Thus, if the intellect were composed of matter and form, it would exist as an individual composed of matter and form. This, however, cannot be true of the intellect because of the way species of things are understood by the intellect. The intellect understands only intelligible species, that is, it understands species of things once they have been abstracted from matter. Prior to being understood, things are only potentially intelligible and the intellect makes them actually intelligible by separating out individual material characteristics. Only after they have been made actually intelligible, the species of things become one with the intellect [the intellect becomes its objects], i.e., what is understood [actualized] by the intellect becomes one with the intellect. If the intellect appropriated things composed of individual matter and form [individuals] then they would exist in the intellect as individual things made of matter and form, which is absurd. Thus the intellect cannot be composed of matter and form.

Aquinas' *third* argument uses two principles: 1] *to act belongs to that which exists*; and 2] "action terminates in a thing like an agent that produces it."[367] First, only that which exists acts. Since the composite exists through its form, so it also acts through its form. But the action does not belongs to matter alone or form alone but to the composite. Next, according to the second principle, the composite produces or generates a composite. So if the intellect is a composite its action produces a composite. The act of intellect is understanding. Thus if the act of understanding is an action of the composite, it understands only composites. This would mean that the intellect does not understand form or matter. But this is false – the intellect understands forms abstracted from matter, and it understands matter as the principle of potentiality. Therefore, intelligent substance cannot be a composite of matter and form.

The *fourth* argument uses the notion of *perfect mode of existence of form* in the intellect and in matter. First, the forms of sensible things have more perfect existence in the intellect than in matter. The reason is they are simpler and so they apply to many things. For example,

[365] *Ibid.*, Ch. 50, 3.
[366] Forms do not exist separately from individuals of which they are forms.
[367] Aquinas, *Summa Contra Gentiles – Book Two: Creation, op. cit*., Ch. 50, 4.

one intelligible form of dog applies to all dogs, i.e., by this one form the intellect knows all dogs – what dogs are. Second, the perfect mode of existence of form in matter means that the form makes a thing to be actually such; for example, it makes something to be a tree or to be a dog. And if the form does not make it actually such, then its mode of existence is imperfect. Aquinas gives examples of the form of heat being carried by air [the form of heat does not make air to be heat itself, i.e., it does not change the form of air – what air is – but just makes it hot], or the power of the first agent in the use of its instruments [e.g., my power to write has only an imperfect existence in the tools I use for writing – my computer]. Thus, since 1] forms exist in the intellect more perfectly than in sensible things, and 2] forms that have perfect mode of existence in matter make things actually such, if the intellect were composed of matter and form, this would mean that the forms of things that exist in the intellect [are known by the intellect] would make the intellect actually such [e.g., actually a rock]. That is, based on the perfect existence of forms in the intellect and in matter, if the intellect were composed of matter and form, the form of a thing existing in the intellect would make it have the actual nature of the thing known. This is absurd.

Aquinas' *fifth* argument is based on 1] the principle that "a thing's mode of presence in its recipient accords with the mode of being of the recipient",[368] and 2] the idea that *material forms* of things existing outside the mind are *not* actually intelligible and in order to become intelligible they must be abstracted from their particular material conditions. If the intellect were composed of matter and form, it would be a physical body, and the forms of things would exist in the intellect materially just as they exist in matter outside the mind. But since the forms of things existing outside the mind are *not* actually intelligible, this would mean that the forms of things that would be present in the intellect would *not* be actually intelligible either. But they are, and therefore the intellect cannot be composed of matter and form.

The *sixth* argument is based on the difference in the mode of existence of *contraries* in matter and in the intellect. It uses the principle of non-contradiction – a thing cannot be and not be in the same respect, at the time and place. For example, a thing cannot be white and non-white in the same respect, time, place, etc. However, contraries do not exclude each other in the intellect; in fact, they serve as each other's background since one can be understood through consideration of the other.

Finally, the *seventh* argument is based on the difference in the reception of forms in matter *versus* in the intellect, i.e., *change* and *motion* in bodies *versus perfection* and *rest* in the intellect. The reception of forms in matter is always accompanied by motion and change,

[368] *Ibid.*, Ch. 50, 6.

including the corruption of one substantial form in favor of another. But as the intellect receives forms, its knowledge increases and the intellect is perfected. This shows that forms received by intellect are not received as if they were received into matter; therefore, the intellect is not a material thing.

4.4.3. The intellectual substance is not a material form

Thus far, Aquinas has shown that intellectual substance is not a body [Ch. 49] and that it cannot be composed of matter and form – it is immaterial [Ch. 50]. Now, he is 'peeling away' another layer of possible dependence of the intellectual substance on matter. In Ch. 51, Aquinas argues that intellectual substances are subsistent forms. They are not material forms, that is, their being does not depend on matter.[369]

His *first* argument is based on the idea that forms whose being is dependent on matter do not have being *per se* – their existence is not separate from matter.[370] It is the composite that has being through its form. Thus, Aquinas argues that if intellectual substances would depend on matter for their being, they would have material being which would be the same as if their being were composed of matter and form. He has already shown that they are not composed of matter and form, thus the being of intellectual substances is not material.

Aquinas' *second* argument follows on the first but emphasizes the principle that only *that which subsists per se, acts*. Forms that do not subsist through themselves cannot act through themselves. Material forms do not have being *per se* [they are dependent on matter for their being] and so they cannot themselves act. It is the composites that act through their forms. So if intellectual substances were material forms [which are not subsistent], they would not themselves understand [act]; instead, what would understand would be the composites of matter and forms. But this would mean that intelligent substances are composed of matter and form, and it has been shown [Ch. 50] that this is not possible.

The *third* argument is based on a variation of the principle that things are received according to the mode of being of the recipient. This means that if the intellect is a material form and not self-subsistent, then whatever is received into the intellect is received into matter because "forms whose being is bound to matter receive nothing that is not received into

[369] *Ibid.*, Ch. 51.
[370] Material forms have their being educed from the potentiality of matter. *Idem, On the Unity of the Intellect, op. cit.*, Ch. 46, p. 29.

matter."[371] The mode of being of the receiver [in this case a material form] receives things according to its mode of being, so whatever is received into material forms must be received into matter. However, forms that are received by the intellect are not received into matter – they must first be abstracted from material conditions. Therefore, the intellect cannot be a material form.

Finally, Aquinas points out that there would be no real but only a nominal difference between saying that intellect is a form embedded in matter and saying that the intellect is composed of matter and form. The intellect would be a form of a composite in the first case but would itself be a composite in the second case. Since it is false to say that the intellect is a composite of matter and form [Ch. 50], so it is false to say that the intellect is a material form.

4.4.4. Recapitulation of the basic ideas and principles of Aquinas' arguments for the immaterial nature of intellectual substances

Aquinas' arguments may appear daunting because of their sheer number, detail, precision, and fine distinctions. Since I have explained some of them in great detail, at this point I will briefly itemize their main ideas and principles. This will highlight the key points of his arguments. I want to bring attention to their organization, which gradually peels away any dependence of intellectual substance on matter. First, he shows that it is not a body, nor can it be a composite of matter and form, nor can it be a material form; that is, its being is not dependent on matter for its existence. Intellectual substance is thus subsistent.[372]

The arguments in Ch. 49 are based on the following principles or ideas:

Argument1: matter and the intellect *contain* things in different ways – whereas matter contains things by quantitative commensuration, intellect grasps things by its whole self;

Argument 2: reception of substantial forms by matter and intellect has distinct effects – reception of a substantial form results in *corruption* of matter, but the appropriation of forms of things by the intellect makes it more *perfect*;

[371] Aquinas, *Summa Contra Gentiles – Book Two: Creation*, *op. cit*., Ch. 51, 4.

[372] In Chapters 52-55 of *Summa Contra Gentiles – Book Two: Creation*, Aquinas further explains the nature of intellectual substance. In Ch. 52, he shows that even though intellectual substance is not a composite of matter and form, it is a composite of substantial form and being because its essence is not the same as its existence. Moreover, there is also in intellectual substances the distinction between act and potentiality [Ch. 53]. In Ch. 54, he explains that the composition of substance and being in intellectual substances is not the same as the composition of matter and form. And in Ch. 55, he argues for the incorporeal and subsistent nature of immaterial substances.

Argument 3: matter and intellect receive and possess forms differently – whereas matter is the principle of *diversity* in that it possesses forms as *individuated,* the intellect is the principle of *understanding* since it possesses forms as universals;

Argument 4: *form* is *the principle of action – action follows form* – bodily/material form 'knows' only bodies, but the intellect knows more than bodies;

Argument 5: a body has a *finite* nature whereas the intellect has in some sense an *infinite* nature;

Argument 6: a body has *spatial* character but the intellect has *non-spatial* character;

Argument 7: a body and the intellect are different in action – whereas the body has *no self-reflexive* action, the intellect is *self–reflexive*, i.e., not only does it reflect on its actions but also on itself;

Argument 8: a body does not decide on its acts, but the intellect is aware of its actions and can direct then to their end – its acts end in action.

In summary, the arguments in Ch. 49 are based on contrasting and bringing out the key differences between the properties of material bodies and characteristics of intellectual substances. The characteristics of a *physical body* [matter] include:

- being restricted by quantitative commensuration
- corruptibility
- divisibility
- being limited to action only in the physical realm
- being finite
- being restricted by spatial dimensionality
- lack of capacity for reflection and self-reflection
- lack of awareness of its acts.

In contrast, the *intellect* is characterized by:

- not being restricted quantitatively – the intellect knows wholes and parts [all] by its whole self
- being incorruptible
- knowledge of universals
- knowledge that extends beyond physical bodies [action follows form]
- being in some sense infinite
- not being spatially restricted

- being self-reflexive – the capacity to reflect on things and itself
- awareness and directness of its acts – it knows that it acts and how to direct its actions.

To argue that intellectual substances are *not* composed of matter and form [Ch. 50], Aquinas uses the following principles or distinctions:

Argument 1: the definition of a body as that which is composed of matter and form;

Argument 2: the difference in the mode of existence of form in matter [in a composite as individual form and individual matter] versus in the intellect [as intelligible species, as universals] - [particular vs. universal];

Argument 3: this comprises two principles: a] to act belongs to that which exists – even though the composite exists through its form, the act belongs to the composite through its form; and b] like produces like – if the intellect is a composite of matter and form, and its act is understanding [what intellect 'produces' is understanding], the intellect would understand/know only composites;

Argument 4: this also consists of two ideas: a] the superior existence of forms in the intellect due to their simplicity and universality; b] the perfect existence of forms in matter [the form that exists perfectly in matter confers on it specific being – makes it actually such]. If the intellect were composed of matter and form, form would exist in it as it does it in composite, that is, the form would make the intellect actually such – the forms would make the intellect have the nature of the thing known;

Argument 5: the principle that a] what is received [and exists in a recipient]is in accordance with the mode of being of the recipient, and the idea that b] individuated form, i.e., forms that exist outside the mind, are not intelligible, that is, the unintelligibility of individuated form versus intelligibility of abstracted, universal forms;

Argument 6: the impossibility of existence of contrary forms in matter [at the same time and the same respect] versus the simultaneous existence of contraries in the intellect;

Argument 7: the reception of forms involves motion and change in matter versus perfection and rest in the intellect.

In summary, the arguments in Ch. 50 that the intellect is not a composite of matter and form are based on the following ideas:

- the difference in the *product [effect] of form's action*: the intellect's understanding is not limited to composites but extends to forms abstracted from matter [abstract forms and principles]. If the intellect is a composite it can know only composites;
- the notion of *perfect existence* of forms in the intellect and of forms in matter: a] the superior existence of forms in the intellect is due to their simplicity and universality; b] perfect or imperfect existence in matter – the meaning of perfect existence of form in matter [makes a things actually such];
- the difference in the capacity to hold both contraries;
- corruptibility of matter versus continual perfecting of the intellect.

Finally, Aquinas' arguments in Ch. 51, showing that the intellect cannot be a material form [a form embedded in matter], are based on the following principles:

1] the forms that are dependent on matter for its being do not have being *per se* – thus they do not exist apart from matter but exist only as composites;

2] only that which subsists *per se*, acts;

3] whatever is received is received according to the mode of being of the receiver.

Basically, these arguments show that if the intellect were a material form, its being would be the same as if it were a composed of matter and form, and this he showed to be false.

All Aquinas's arguments show that intellectual substances are immaterial. In summary, we can say that Aquinas' arguments for the immaterial nature of the intellect are ultimately rooted in the essential differences between the material bodies and the intellect. The differences between matter and the intellect are pointed out by Aristotle and further explained by Aquinas. They are based on observation and on Aristotle's *method of inquiry*, according to which a proper object manifests the activity which reveals the power that makes this activity possible. The next question that Aquinas tackles is how the intellectual substance, although it is not a body, is connected to a body.

4.5. On the connection of the intellectual substance to the body

Although the main focus of this work is Aquinas's arguments for the immaterial nature of the human intellect, I decided to include his explanation of the possible ways the intellectual substance is connected to the body as this will provide a broader background for his arguments. He has already established that the intellectual substance is not a body, is not composed of matter and form, is not a material form. Its being is not dependent on a body and

thus it is subsistent. The question now is how it is possible for an immaterial intellectual substance to be connected to a physical body to become one substantial being.[373] Aquinas begins his explanation by looking at possible ways the intellectual substance *could* be connected to the body.[374] Next he looks at the various solutions to the intellect/body connection proposed by philosophers such as Plato, Avicenna, Averroes, and others[375] and points out the shortcomings in their explanations. Against these apparent failures, Aristotle's view of the soul as the form of the body stands out as the most reasonable solution. However, Aquinas takes it a step further and provides a detailed explanation of how the intellectual substance is connected to the body as its substantial form. Aquinas first looks at the two main ways two substances could be connected to one another: by way of *mixture* or by way of *contact* "properly so called,"[376] that is, *contact of quantity*. He rejects the idea of the connection of the intellectual substance to the body by way of mixture or by way of contact of quantity, and suggests instead that *contact of power* is the only reasonable option in this case. In the end, he shows that the intellectual soul, as the form and the first act of the body, is one with the human body; that is, they are not two separate substances but they are joined in the unity of one act of existence – they are one whole substance, a human being. Again I will track his arguments closely because it is fascinating to follow his reasoning on how the soul is one with the body.

4.5.1. Ways of possible connection

Aquinas first considers connection *by way of mixture* and offers two arguments against it.[377] The first addresses the question of what is necessary for elements to be mixed; the second focuses on what happens to elements once they have been combined. Insofar as mixing involves alteration of elements in relation to one another, mixture requires that they are made from the same matter, so that they are able to affect or be affected by one another. This, obviously, is not possible if two substances have no matter in common, cannot be active or passive in relation to one another, and thus cannot affect one another. Since an intelligent

[373] Aquinas, *Summa Contra Gentiles – Book Two: Creation, op. cit*., Ch. 56.
[374] *Ibid.*
[375] *Ibid.*, Chs. 57-67.
[376] *Ibid.*, Ch. 56, 6.
[377] *Ibid.*, Ch. 56, 3-4.

substance has no matter in common with a body,[378] they cannot be connected by way of mixture.[379]

Moreover, they cannot be connected by way of mixture because this involves change and corruption. Aquinas explains that when elements are combined they are altered, that is, they lose their substantial independence and become the elements of mixture: "having been combined, remain actually, but only virtually."[380] To give a modern example, if we combine oxygen and hydrogen we get water. Even though both elements O and H are still in the water molecule, they are not there as independent elements but are elements of the water molecule. In that sense, they have lost their substantial independence and they became a molecule of water. They are both still there but, as Aquinas says, only virtually. On the other hand, if they were combined but have *not* lost their substantiality, then the result would not be a mixture but a *collection*. Thus, it is *impossible* for the intellectual substance and matter to become one *by way of mixture* because the intellectual substance is incorruptible,[381] that is, it does not lose its substantial independence.

Aquinas next argues that nor can an intellectual substance be united to a body *by way of contact of quantity*.[382] His argument is based on the definition of contact from Aristotle's physics,[383] according to which things are in contact when they come together at their extremities [points, lines, or surfaces] and thus contact is only between physical bodies. Since intellectual substance is not a body,[384] it obviously cannot be in contact with a physical body. Neither can the union between an intellectual substance and a body result from continuation, composition, or colligation [juxtaposition] because these require contact between bodies.

Neither of the ways of contact considered to this point is possible, but there is another way things can be in contact with one another. This contact is *by way of power*. Aquinas explains that things can be said to touch one another (but not physically) if one thing can act upon another that is capable to receive that act and alter it, when: "for example, a person in sorrow touches us."[385] In contact of power, a thing that acts can impress its form upon a thing that is being altered. And because intellectual substances are immaterial and thus have higher degree of actuality than physical bodies, they can act upon the physical bodies and alter them.

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[378] *Ibid.*, Ch. 50.
[379] *Ibid.*, Ch. 56, 3.
[380] *Ibid.*, Ch. 56, 4.
[381] *Ibid.*, Ch. 55.
[382] *Ibid.*, Ch. 56, 4.
[383] Aristotle, *Physica*, *op. cit.*, V, 3 [226a23].
[384] Aquinas, *Summa Contra Gentiles – Book Two: Creation*, *op. cit.*, Ch. 49.
[385] *Ibid.*, Ch. 56, 8.

In short, Aquinas' argument for how an immaterial substance can touch a physical substance/a body is thus based on the idea of *activity and passivity***,** which is rooted in the notion of *act and potency* and on the idea of superior actuality of intellectual substances. His argument is also based ultimately on the essential difference between immaterial substances and matter or physical bodies.

Understanding the difference between *contact of power* and *contact of quantity* is crucial to explain how an immaterial substance can be connected to a physical body. Aquinas explains in great detail the three ways in which they differ. First, by *contact of power* the indivisible can touch the divisible. This cannot happen in *contact of quantity* because, explains Aquinas: "only the indivisible thing can be touched by a point."[386] However, even though it is indivisible, an intellectual substance can touch the divisible when it acts upon it. Now it could be argued that since a point is also indivisible, it could touch another indivisible thing [e.g., immaterial substance]. But Aquinas explains that a point is indivisible by being a terminus of a quantity and so it occupies a determinate position in a quantity [line] and it cannot extend beyond it. In other words, a point, even though it is indivisible, is always locked within the physical realm. By contrast, intellectual substance is indivisible because it is outside the genus of quantity, that is, it is *not* a quantitative [physical] entity. This is also the reason, explains Aquinas: "why no quantitative indivisible entity with which it could make contact is assigned to it."[387] That is, even though there is an indivisible entity in the quantitative genus, e.g., a point, because an intelligible substance is completely outside the genus of quantity there is no quantitative indivisible entity with which it could be connected.

The second difference is that *contact of quantity* can affect only 'extremities' [aspects or parts of a physical thing], whereas *contact of power* regards the whole thing it touches, that is, the whole thing is acted upon and moved [changed, altered, affected]. This is possible because a thing gets affected only because it is in potentiality to be affected, and the potentiality to be affected regards the entire thing, not only extremities of the whole. For example, I am in potentiality to change [or be changed, pushed, etc.] and this regards my entire self, whereas in contact of quantity only parts of me or my extremities are affected.

The third difference comes out of the second. In *contact of quantity* the thing that touches is *extrinsic* to that which is touched, but *contact of power* touches the *innermost* things. Again, this is because *contact of quantity* is contact of extremities, whereas *contact of power*, which pertains to intellectual substances, extends to the innermost things. Thus,

[386] *Ibid.*, Ch. 56, 9.
[387] *Ibid.*

contact of power by which intellectual substances can act upon a body affect the innermost things.

Thus far, Aquinas has shown that *contact of power* can explain how intellectual substance can be connected to a body. But the main point is to prove that an intellectual substance is *united* to a body so that they are *one being*. And *contact of power* does not entail that things united by it are unqualifiedly one. They are one with respect to acting and to being acted upon; however, they are not united as one. Aquinas explains that even though: "one is predicated in the same mode as being…to be acting does not mean to be, neither is to be one in action to be one.*"*[388] That is, the relation of activity and passivity does not entail the unqualified unity of things. In the next step, Aquinas looks at different senses of the term '*unqualifiedly one'* to see which expresses the unity of the intellectual substance with a body. To be *'unqualifiedly one'* can refer to *indivisible*, to the *continuous,* or to the *one in reason.* Obviously, the union of an intellectual substance and a body is *not* indivisibly one because it is a composite of two things [an intellectual substance and a body]. Neither is it continuously one because being continuous refers to quantity [parts of something continuous are parts of quantity]. The intelligent substance is not a body, so it cannot be understood in terms of quantity. Since the union of an intelligent substance and a body is *not* one in the sense of being indivisible or continuous, the remaining option is that this union means being *one in reason*. Aquinas points out that the only way two permanent entities can become *one in reason* is if one entity has a character of substantial form and the other of matter. This kind of unity does not happen in case of accidental forms, that is, joining of a subject and an accidental predicate does not result in a thing *one in reason*; Aquinas points out that, for example: "the idea of man is not the same as idea of white."[389] The bottom line is that it is the substantial form that gives being and unity to a body – it makes it such a substance. Thus two entities can indeed be united to become unqualifiedly one – *one in reason* – only when one has the character of substantial form and the other of matter.

In summary, Aquinas has shown that an intellectual substance *cannot* form a union with a body by way of contact of either mixture or quantity, which are possible only between physical entities. However, things that cannot be united to one another by *contact of quantity can* touch one another by *contact of power*. This can happen if they are related to one another as that which acts and that which is being acted upon, that is if they are in relation of activity and passivity. Furthermore, two entities can form a unity in an unqualified sense of being one

[388] *Ibid.*, Chs. 56 and 69.
[389] *Ibid.*, Ch. 56, 9.

[*one in reason*] only if one entity is the substantial form and the other is matter. And this, Aquinas argues, is how the intellectual substance can be united to the body.

It is worth noting that Aquinas' arguments are based ultimately on the *essential difference* between quantitative properties of matter and physical bodies on the one hand and, on the other hand, the immaterial, indivisible properties of intellectual substances. In other words, they are based on the essential properties of matter *versus* the essential nature of intellectual substances.

4.5.2. Possible objections and Aquinas' replies

By this point, Aquinas has shown that it is possible for entities to become one being through the relation of activity and passivity but only if one entity is a substantial form and the other matter. The next step is to inquire whether the intellectual substance can be connected to the body as its substantial form so that two of them become a being that is unqualifiedly one. Aquinas remarks that since the idea of such union seems impossible to some philosophers, he brings up several possible objections to the idea of the intellectual substance being the form of the body. Interestingly, Aquinas does not seem to disagree with the principles stated in the objections; instead, he makes finer distinctions to show how these principle are misapplied.[390]

The first objection uses the principle that "from two actually existing substances one thing cannot be made, because the act of each thing is that by which it is distinguished from another".[391] The reason is that the act of each thing is what gives it being, makes it a definite substance, and thus differentiates it from other beings. But if an intellectual substance is an actually existing substance and a body is another substance then they cannot be made into one substance.[392] Aquinas responds that this objection is based on a faulty supposition.[393] It is assumed that body and soul are two actually existing substances and that each has an independent being. However, they are *not* two separately existing substances; instead, the two of them together make one actually existing substance. This is obvious from the fact that the body of a human being is not actually the same when the soul is present or absent. The soul

[390] Aquinas states objections and responses in two different chapters: *Ibid.,* Chs. 56 and 69.
[391] *Ibid.*, Ch. 56, 14.
[392] *Ibid.*
[393] *Ibid.*, Ch. 69, 2.

makes the body to be actually, that is it actualizes the potentiality of a body to become an existing human being.[394]

The second objection uses the principle of classification of beings, namely, things which belong to two diverse genera – that do not have the same kind of being – cannot be made into one thing.[395] The form and matter are in the same genus, but an intellectual substance [immaterial] and a body [matter] belong to two different genera, and so one cannot be the form of the other. Aquinas replies that indeed matter and form belong to the same genus.[396] However, they are in the same genus *not as two species* of the same genus, but as *two principles* of the same species.[397] If the intellectual substance and matter did exist apart from another, then they would be species of different genera. That is, the intellectual substance would be one species belonging to the genus of entities whose essence is that of intellectual substance [i.e., immaterial, indivisible, incorruptible, etc.], whereas matter would be a species belonging to the genus defined by the essential properties of physical matter such as quantifiability, divisibility, mutability, etc. However, as Aquinas points out, the intellectual substance and the body are united: *"*but by being united they are one and the same genus as principles of it."[398]

The third objection uses the principle that, according to Aquinas: "everything whose being is in matter must be material."[399] Since form is the act of being of matter [makes it such and such being], this implies that being of that act must also be in matter – must be material. So if the intellectual substance is the form of a body, its being must be in matter. But this would mean that intellectual substance is not immaterial. In his reply, Aquinas explains that if the form is fully embedded in matter then its being is indeed material, i.e., it is a material form.[400] But it does *not* follow from the fact that the intellectual substance is in matter that it is a material form. This is because the soul is not fully embedded in matter. Not all operations of the soul are effected by a bodily organ and thus not all of the soul's powers are acts of the body. The intellectual soul has an intellectual operation/understanding in which matter has no

[394] *Ibid.*
[395] *Ibid.*, Ch. 56, 15.
[396] *Ibid.*, Ch. 69, 3.
[397] Matter and form belong to the same genus as principles of the same species – matter and form make up one substance.
[398] Aquinas, *Summa Contra Gentiles – Book Two: Creation*, *op. cit*., Ch. 69, 3.
[399] *Ibid.*, Ch. 56, 16.
[400] *Ibid.*, Ch. 68.

part and it is not effected through any bodily organ, therefore the soul is not fully embedded in matter.[401]

The fourth objection claims that it "it is impossible for a thing that has its being in a body to be separate from the body."[402] This objection uses two ideas to argue that it cannot be the form of the body: first, that the form of a body, as its act, must be fully embedded in matter and so cannot be separate from it; and second, the philosophical proof that the intellect is separate from the body, i.e., it is not a body or a power in a body. It is argued that if the intellectual substance is indeed the form of the body then its being is in the body, that is, it cannot be separate from the body. But this is against what the philosophers proved, i.e., that the intellect is separate from the body. Therefore, the intellect cannot be the form of the body.

In his reply Aquinas makes the key *distinction* between the *essence* of the soul and its *power*.[403] The soul's essence gives being to such a body, that is, it makes a thing what it is. But the soul's power is responsible for its proper operations – the soul acts through its powers. This distinction is crucial to show that *not* every act of the soul is the act of the body. Some operations of the soul are carried out by a bodily organ and in such cases, the power of soul, which is the principle of that operation, is an act of the body. For example, the operation of seeing is a bodily act [an eye]. However, if the soul's operation is not effected by a bodily organ, then the soul's power is *not* the act of the body. And this means that the intellect is *separate* from the body. Insofar as the operation of understanding is not effected by a part of a body, the intellect, as the soul's power of understanding and the principle of the operation of understanding, is not an act of the body. This, however, does not preclude the substance [essence] of the soul [of which the intellect is the power] to be the act of the body as its form and to make it such a being. The distinction between the soul's essence and its powers is critical in order to appreciate that its being the substantial form of the body does not mean that the soul must be a material form.[404]

In the fifth objection the principle '*action follows being'* is split into two related parts: 1) every thing acts in keeping with its being; and 2) "operative power is consequent upon the principles of the essence of a thing".[405] It is argued that since form and matter result in a thing that is unqualifiedly one, this implies that, if the intellectual substance is indeed the form of

[401] *Ibid.*, Ch. 68, 12.
[402] *Ibid.*, Ch. 56, 17.
[403] *Ibid.*, Ch. 69, 5.
[404] In my opinion, the distinction between the soul's essence and its powers provides a very convincing argument for why the intellectual soul can be the form of a body and yet have an operation that is independent of it.
[405] Aquinas, *Summa Contra Gentiles – Book Two: Creation, op.cit*., Ch. 56, 18.

the body, it must exist in one act of being with the body – that is, its being has to be fully embedded in the body. Moreover, since action follows being, and so the power of the thing cannot be superior to its essence, it is argued that the soul's power and its operations must also be acts of the body. Thus both, the soul's essence and its powers are in the body. Thus, the human soul is dependent on the body for its existence and its powers. Aquinas' reply is directed at those who, although they agree that intellectual substance is the form of a body, claim that in that case, its being must also be in a body.[406] In his reply Aquinas again underlines the distinction between the soul's essence and its powers. From the fact that the soul is the substance of the body as its form, it does not follow that all of its powers are in the body. And this is possible because the human soul is *not* fully embedded in matter.[407] This means that not only can the soul produce an operation that is not an act of the body but that it is existentially independent of the body – its being does not depend on matter.

4.5.3. Aquinas' arguments for how an intellectual substance can be the form of the body

Aquinas has shown that an intellectual substance can be connected to a body by contact of power which is the relation of act and potency. This, however, can happen only if the two entities are *one in reason,* and this in turn is possible only if one entity is substantial form and the other is matter. He also showed that major philosophical solutions were inadequate to explain how an intellectual substance and a body can be one substance.[408] In the next step he presents his own arguments that the human soul is an intellectual substance that is united to the body as its form.[409]

His argument deals with two issues: first, with the general problem – how one thing can be the substantial form of another; and second, with the specific question – how an *intellectual* substance which is subsistent [one thing] can be the substantial form of a human

[406] *Ibid.*, Ch. 69, 6.
[407] Aquinas has already shown in *Summa Contra Gentiles – Book Two: Creation, op. cit.*, Ch. 68, 12, that if an operation of the soul is not a bodily act, then neither is the power of the soul, as the principle of that operation, an act of a body. Since understanding is not an operation effected by a body, this shows that not of all acts of the soul are bodily acts. Thus, the intellectual substance, which is the principle of an operation of understanding, is *not* fully embedded in the body.
[408] *Ibid*., Chs. 57-67. Aquinas argues against several philosophical positions on the connection of intellectual substance to a body, including those of: Plato, who claimed that the soul is united to the body as its mover; Averroes, who argued that the soul is in contact with the body by phantasms; Alexander, for whom the intellect is preparedness; Galen, who saw the soul as temperament; and Empedocles, who claimed the soul is harmony. Aquinas also argued against those who held that the soul is a body or is identical to the senses or imagination.
[409] *Ibid.*, Ch. 68, 1-2.

body [another thing].[410] In order for one thing to be a substantial form of another thing two requirements must be met. First, the form must be the principle of substantial being of a thing. This means that it must be the formal principle of a thing, that it, it confers existence and makes it such and such a being. Second, the form and the matter must be united in the *single act of being*, that is, they cease to be two distinct entities but they exist as one being.[411] Aquinas adds that this unity of being is not true for the efficient cause. Even though it also gives being, the efficient cause is *not* united to that to which it gives being.[412]

Thus, the fundamental distinguishing characteristic of the union of matter with its substantial form is being joined together in the single act of existence. And this is what it means to be and exist as a composite substance. The union of matter with its substantial form is in no way accidental but, to the contrary, it lies at the root of being a composite substance – it is essential to being a composite substance. Aquinas expresses it perfectly: "The single act of being is act in which composite substance subsists. A thing one in being and made up of matter and form."[413]

So far Aquinas has answered the first question, that is, how one thing can be the substantial form of another thing. Now, he addresses the specific question, namely, how an *intellectual* substance can be the substantial form of human body. It would seem that since intellectual substance is subsistent,[414] it could not exist in the single act of being with matter. But Aquinas argues its being subsistent does not prevent an intellectual substance from being the *formal principle* of matter and communicating its own being to matter. This is possible because the composite exists only by the form; thus it makes sense that the composite and its form exist in one act of being. Moreover, neither the composite nor its form exist apart from each other.[415]

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[410] *Ibid.*, Ch. 68, 3.

[411] *Ibid*. "First, the form must be the principle of substantial being of a thing whose form it is, that is, it must be the formal principle whereby a thing exists and is called a being. The second requirement is that the form and the matter be joined together in the unity of one act of being.*"*

[412] As an example, we can think of a mother as the efficient cause of her child, and in this sense she gives being to her child; however, she is *not* joined together to her offspring in one act of being – she and the child exist in two separate acts of being – they are two different beings.

[413] Aquinas, *Summa Contra Gentiles – Book Two: Creation*, *op. cit*., Ch. 68, 3.

[414] It is not dependent on matter for its being.

[415] The statement that *neither the composite nor its form exist apart from each other* seems at first strange since the intellectual substance is subsistent. However, this appertains only to composites made up of matter and material form. The composite exists only by its substantial form. But when the composite falls apart its substantial form ceases to be the form of that composite. Since the human being is a composite of matter and substantial form, this would suggest that the human soul as its form cannot subsist after the composite falls apart. However, the human soul as the substantial form of the human being is the intellectual substance and as such it is subsistent. Thus it continues to be after destruction of the composite. Its subsistence is possible because the intellectual substance is

Being typically thorough in his argumentation, Aquinas also raises another possible objection to the union of the intellectual substance and matter. The intellectual substance cannot communicate its being to corporeal matter and they cannot exist in one act of being because they belong to diverse genera and so have different modes of being. But Aquinas explains that this objection would be correct if the single act of being belonged to matter and intellectual substance in the same way. However, it does not because in the single act of being a composite, matter is the recipient and subject of being and is raised to a higher level of being. In contrast, the intellectual substance is the principle and act and it retains its own being as such.[416] Aquinas adds that being one in existence is perhaps greater for a thing composed of an intellectual substance and matter than for a thing composed of matter and material form. The reason is that the more superior the form, the greater is its influence over matter and so the greater is the unity of that which is made from them.[417]

Moreover, even though form and matter are joined together in the unity of one being, this does not mean that matter has to be equal to form because "the higher the form, the more it surpasses matter in its being".[418] This, in turn, is based on the principle that *action follows being* – "as a thing is, so does it act*"*.[419] These principles are based on observations of things; for example, the life of an animal is more complex than that of a plant. Thus the forms, which are the principles of their vital operation, are arranged hierarchically – the sensitive form is superior to the nutritive form, etc. The principles also explain why the form whose operation transcends the condition of matter [is not an act of a body], is superior in its being to matter. In Aquinas' words: "a form whose operation transcends the condition of matter, itself also surpasses matter in the rank of its being."[420] The last argument leads to a brief discussion of the hierarchy of forms. At the lowest level there are the forms of the elements that are material and entirely embedded in matter. Next are the forms of 'mixed bodies' – that is of elements with more complex properties [e.g., magnetism]. The next and higher level of being belongs to the forms of plants because they can also produce operations of nutrition and movement. An even higher rank is that of the forms of animals [sensitive souls] that also have the operations of sensation and sensitive knowing. Above these forms is the form of higher

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immaterial and thus incorporeal. The human soul has an intellectual operation of understanding which is not an act of the body and therefore the human intellectual form is not fully embedded in matter. Thus, when it is separated from matter in death, the intellectual form continues to be, even if is not the full existence of a human being.

[416] Aquinas, *Summa Contra Gentiles – Book Two: Creation, op. cit*., Ch. 68, 4.

[417] *Ibid.*, Ch. 68, 6.

[418] *Ibid.*, Ch. 68, 7.

[419] *Ibid.*

[420] *Ibid.*

substances, those whose operations not only involve the previous operations of nutritive and sensitive souls, but also the operation of understanding.[421] This form is superior to other forms because it can produce operations that can be effected without any bodily organ. The operation of understanding is not effected by any bodily organ and so this form is the intellective soul. And this also why this form is not fully embedded in matter.

In sum, Aquinas' arguments for joining together an intellectual substance and a body in the unity of one act of existence, that is, the arguments for the intellectual substance being the substantial form of human being, are rooted in several main notions: 1] activity and passivity [act and potency]; 2] the notion of unqualifiedly one as *one in reason;* 3] the crucial distinction between the soul's essence and its powers; and ultimately 4] the difference between quantitative properties of matter and physical bodies *versus* the immaterial, indivisible properties of intellectual substances, that is, the essential properties of matter *versus* the essential nature of the intellect.

4.6. Further thoughts

Aristotle's insights and explanations of the nature of the soul and of the differences between the sensitive and intellectual knowing were undoubtedly the inspiration and the source of Aquinas' work on the intellect. But as can be seen, he takes up Aristotle's arguments and creates his own monumental masterpiece on the immaterial nature of the intellect and thus on the human intellectual soul.

All of Aquinas' arguments on intellectual substance are intended to show that intellectual substance is immaterial, incorruptible, and subsistent. Furthermore, the only way for an intellectual substance to be connected to a body, so that the two are united in a single act of being, is for intellectual form to be the substantial form of a human body. This unity is not accomplished via another principle [phantasms, or one common intellect][422] but is the actualization of potentiality of matter to become a human being.

However, Aquinas makes it clear that the unity of the intellectual soul with a body in the single act of existence does not mean that the soul is dependent for its being on a human body. He has already shown that the intellectual substance is not a body, it is not a composite

[421] *Ibid.*, Ch. 68, 8-12.

[422] Averroes, in Aquinas' analysis in *Summa Contra Gentiles*.

of form and matter, and it is not a material form – it is not educed from the potentiality of matter.

Aquinas' explanation of the difference between the composite of substance and being and the composite of form and matter can help illuminate this point further. The composite of form and being is due to the fact that *form's essence is not the same as its existence*. The identity of essence with existence is true only of God whose essence is His existence; that is, only He is the absolutely necessary being. In everything else there is separation between *what a thing is* and *its existence*, and this includes intellectual forms. This distinction between what they are and their being constitutes the first distinction between potency and matter. And since their essence is not identical to their existence, their existence is not absolutely necessary – they had to be caused by something else to exist [created by God]. Nonetheless, once they exist, the intellectual substances are incorruptible by virtue of their immaterial nature. They are not material forms and their being is not educed from the potentiality of matter. This, however, is true only of intellectual substances. *All other existing substances, including human beings, are composites of matter and form, and thus, in them there is a twofold composition of potency and act*. Insofar as they are composites of matter and form, there is potency of matter in relation to form as its act. And then there is a composition of thus formed substance [i.e., the composite of matter and form] and being. All composites of form and matter are corruptible in regard to their matter.

This twofold composition of potency and act can help explain the corruptibility of human being, and on the other hand, explain how it is possible for the intellectual soul of a human being to be immaterial and incorruptible. That is, insofar as a human being is the composite of matter and form he is corruptible with regard to matter. However, his substantial form, as that what makes him a human being, is an intellectual substance which is immaterial. This immaterial intellectual substance is united to matter as its substantial form; however, it is not dependent on matter for its being thus it is also incorruptible and subsistent. This is exactly the point he argues in *Summa Theologiae* and *Summa Contra Gentiles*.

It would be a monumental task to discuss and assess every principle and idea Aristotle and Aquinas use to argue for the immaterial nature of the intellect. Nonetheless, there are a couple of issues that stand out. The first is Aristotle's argument [also explained by Aquinas] about the nature of the intellect as 'no-thing'.[423] In order to be capable of knowing *all* sensible things the intellect cannot be any actual thing, that is, it cannot be a physical body, and it

[423] I have to admit I find Aristotle's concept of the mind as no-thing, as pure potentiality to know all things, fascinating.

cannot have a nature of any sensible thing [Aquinas]. The intellect is pure potentiality to become its objects of understanding, and in knowing, the intellect becomes the things it understands. Of course, it does not become things physically but it becomes forms of the things it knows.

This obviously is based on the observation that the intellect is capable of knowing all sensible things, that is, the entire physical universe can become the object of knowledge. This, in turn, is based on the assumption that the universe is real and intelligible. Thus, Aristotle's argument about intellect's capacity to know all things is based on the observation that humans know, speculate, and constantly apply their knowledge, including about the real existence of the external world[424] and the intelligibility of the physical universe – human beings can know the universe because it is intelligible.[425] If we agree with Aristotle's and Aquinas' basic observation about what the intellect does, namely, that it can and it does know things, then their explanation of how it is possible for the intellect to know things, and thus what must be its own nature, is indeed compelling.

The second issue is related to Aquinas' arguments for the immateriality of the intellectual substance: that intellect is not a body, nor a composite of form and matter, nor a material form. As we have seen, his arguments are based ultimately on the essential difference between the properties of matter and intellect, which itself is based on the observation of the nature of material objects and of the nature of intellectual objects [concept and ideas]. Clearly, for Aristotle and Aquinas, we do know sensible things; however, in order for them to become appropriated by the intellect [to become one with the intellect], they must be stripped of any individuating characteristics of matter.

In summary, insofar as Aquinas' arguments for the immateriality of the intellect are primarily based on the essential difference between matter/physical bodies and the intellect, they are still valid. Not only have they not been disproven by modern science, but if it is indeed the case that the intellect is immaterial, then to the extent that empirical science can deal only with things circumscribed by time and space, science may never be able to prove otherwise.[426] And yet the notion of the immateriality of the intellect is being continually

[424] Aristotle, *Metaphysica*, *op. cit.*, IV, 4, in which he argues for the reality of the external world.

[425] The actual practice of science is rooted in the real existence of the physical world. How we get to know this reality involves ongoing debate among philosophers of science. The bottom line is that we assume that we can discover and know the physical reality through various means that are part of scientific methodology, which, speaking most generally, includes observation, experimentation, modeling, etc.

[426] Given the present level of scientific knowledge, a couple of questions come to mind. First, do we have any hard empirical evidence that intellectual activity is indeed material? Alternatively, could *all*

challenged under different guises (scientific materialism, physicalism, scientism, etc.) In the next chapter, therefore, I will respond to the dominant materialistic views in the public discourse by offering several contemporary arguments for the non-physical nature of the human intellect.

matter be immaterial and, if so, what would this possibly mean? It could be argued that since matter is modeled by mathematics, matter is, in reality, mathematical. Thus, in principle, insofar as mathematical concepts are immaterial, matter is immaterial. This appears to be a bit of a vicious circle because it involves a question about the nature of concepts as such – are they immaterial or material? But let's assume that mathematical concepts are indeed immaterial. This raises more questions. First, can matter ultimately be reduced to mathematical concepts? A particle or a form of energy may be anticipated and modeled by mathematical formulas. But does this mean that it also has the status of a real observable physical object? Or does it acquire the status of a real particle or field of energy or form of energy only if it is, in fact, somehow observed? In this sense, it does not seem that mathematical concepts and proofs have the same status of physical reality as empirically verified physical objects, even if they do model and correspond to a given physical reality. This, of course, brings up the question of mathematical reality, and there are different views of what exactly mathematical objects are. But the fact that there are different theories on this in itself seems to present a bit of a problem in regard to the nature of quantum mechanics and its objects. Unfortunately, the scientific problem of the nature of matter and whether it can become immaterial or whether, in a sense, it is immaterial [mathematical reality], as captivating as it is, is outside of my field of knowledge and I will not be able to engage in any further speculation about it.

CHAPTER 5
CONTEMPORARY ARGUMENTS FOR THE NON-PHYSICAL NATURE OF THE HUMAN INTELLECT

The previous chapter was devoted to Aquinas' arguments for the immaterial nature of the intellectual substance, but in this chapter we will jump forward to contemporary times. The mood of the present-day is characterized by its absolute faith in science and an overwhelming tendency to interpret the being of human being entirely in terms of the physical science. However, despite this dominant trend toward a physicalist interpretation of the human being, there are philosophers and scientists that disagree with such a reductive approach.

Edward Feser[427] in many of his works [e.g., *Philosophy of Mind*, *Scholastic Metaphysics*, *Aristotle's Revenge, Arguments for the Immateriality of the Mind*] exposes the tendency towards reductive materialistic interpretations not only of the human being but of the whole reality.[428] In *The Science before Science*, Anthony Rizzi argues that human intellectual operations such as abstract thinking or reasoning cannot be reduced to matter.[429] Robert J. Spitzer, in his book *The Soul's Upward Yearning*, discusses several arguments from philosophy, theology, and science for the transphysical character of the human soul.[430] Stephen M. Barr, in *Modern Physics and Ancient Faith*, presents several arguments against reductive materialism.[431] Michael J. Dodds discusses the reasons behind the tendency towards scientism as the default philosophy of the present day.[432] Stanislaw Judycki[433] argues for the immateriality of the intellect based on its intrinsic capacity for meaning. Hans Halvorson[434]

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[427] E. Feser, *Philosophy of Mind – A Beginner's Guide, op. cit.;* E. Feser, *Scholastic Metaphysics*, *op. cit.*; E. Feser, *Aristotle's Revenge*, *op. cit.; E. Feser, Arguments for the Immateriality of the Mind*, 2018.

[428] In *Philosophy of Mind*, Feser goes through all typical approaches to the mind–brain interaction problem and points out that at their core they are materialistic.

[429] A. Rizzi is a theoretical physicist and the author of several textbooks in physics including *The Science before Science*, in which he argues that the intellect cannot be reduced to matter; A. Rizzi, *The Science before Science*, Baton Rouge, 2004.

[430] R. Spitzer, *The Soul's Upward Yearning*, *op. cit.*

[431] S. M. Barr, *Modern Physics and Ancient Faith*, *op. cit.*

[432] M. J. Dodds, *The Philosophy of Nature*, *op. cit.*; M. J. Dodds, *Philosophical Anthropology*, Oakland, 2013.

[433] Stanisław Judycki, prof. dr. hab., Director of the Institute of Metaphysics and Philosophy of Religion, University of Gdansk, Poland. S. Judycki, *Dwa argumenty przeciwko materializmowi*, "Diametros", 2005.

[434] H. Halvorson, *The Measure of All Things, Quantum Mechanics and the Soul*, "The Soul Hypothesis: Investigations into the Existence of the Soul, London, 2010, loc. 2492-2994. Hans

uses the notion of superposition of all physical states. And Jörgen Vijgen[435] uses Aquinas' arguments for the immateriality of the intellectual operation to argue for the subsistence of the human soul.

In this chapter, I will summarize many of these ideas and add a few of my own. I will start out with a more detailed discussion of Barr's analysis of the role of the observer in quantum phenomena. The problem of the observer is well known but is considered controversial and so is often discounted. Nevertheless, I decided to address it because: 1] it has not been disproven by science; and 2] despite many sophisticated scientific and philosophical attempts to prove the materiality of the intellect, there has been no empirical evidence of the material nature of intellectual acts. Next, I will address some of the philosophical implications of the observer, including my proposal that Aristotle's concepts of potentiality and actuality can be successfully applied to an epistemological reading of the traditional interpretation of quantum theory. Finally, I will present several other arguments for the immaterial nature of the human intellect, including those of Halvorson, Vijgen, Feser, and Judycki. All of these have appeared in the literature in the last ten to fifteen years, indicating a renewed interest in the question of the nature of the human intellect and the soul.[436]

5.1. The role of the observer in quantum phenomena

I use Barr's work for several reasons. First, his view of the human being is rooted in the philosophy of Aquinas, that is, the human being is a rational animal endowed with the intellect and free will.[437] Second, his analysis of the role of the observer in quantum phenomena reflects Aristotle's and Aquinas' observations about the fundamental difference between the capabilities of matter and those of the intellect. This, in turn, points to the essential difference in their respective being. Third, Barr's method of argumentation is similar to that of Aristotle and Aquinas – that is, he argues from the difference between the

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Halvorson, a professor of philosophy at Princeton University, has principal interests in philosophy of science, philosophy of physics, and mathematical logic.

[435] J. Vijgen, *Soul or Brain: A False Dilemma? The Thomist Perspective,* "Scientia et Fides", 2017. Jörgen Vijgen is a researcher at the University of Tilburg, Netherlands, Department of Systematic Theology and Philosophy.

[436] In fact, last year [June, 2021] I attended a workshop organized by the Thomistic Institute [Washington, D.C.] devoted entirely to the problem of the intellect in Aquinas – "Knowledge, Truth and Wisdom in Aquinas". This year [May, 2022], another workshop which I plan to attend is entitled "Aquinas on the Soul".

[437] Intellect is the power of reason which allows us to understand ideas and to think abstractly. Free will is the power to make rational and free choices [rational appetite].

capabilities of physical bodies and those of the human intellect. Fourth, he has a superb ability to explain complex ideas in a very accessible manner and his explanations are honest and clear.

Barr's main question is whether a human being and his faculties of intellect and will can be understood in purely mechanical terms. Can they be reduced to matter? He presents two typical materialistic and mechanistic interpretations of the mind or, more specifically, of the intellect.[438] According to the first, the mind is simply a computer – an automaton that follows the rules. Barr uses the Lucas-Penrose argument, which is based on Gödel's theorems, to argue that the human mind cannot be reduced to a computer, specifically that the intellect's activity of understanding cannot be explained entirely in terms of a computer program. Although Barr is no longer fully convinced of the power of the Lucas-Penrose argument, he still thinks that Gödel's theorems point to the immateriality of the human intellect: "At least, they undermine formalism and tend to support mathematical Platonism."[439] Barr's analysis of the unique power of the human intellectual act of understanding and of the difference between the capabilities of computers [the work of the computer] and the human act of understanding are excellent.

According to the second mechanistic/materialistic interpretation, the mind is just matter in motion. Barr's argument against this view is based on the role of the observer in quantum phenomena. Even though the role of the observer has its critics, Barr is convinced of its anti-materialist significance. Below I am quoting his response to my question whether he was still convinced about the implications of the role of the observer in quantum phenomena. He was extremely gracious and responded to my question. In Barr's words:

> "Re quantum mechanics. I am more certain than before of its anti-materialist implications. My only doubts on that score were about whether the MWI [many-world

[438] Throughout this work, I make a distinction between the mind and the intellect. The reason is that in contemporary parlor, the mind includes not only the intellectual operation of understanding, but also emotions, desires, or imagination. By contrast, Aristotle and, even more clearly, Aquinas make a clear and fundamental distinction between the operations of the sensitive soul [sensation, perception, imagination, memory] and the intellectual operation of understanding, or reasoning. As already explained, this distinction allows Aquinas to argue for the intellectual soul being the substantial form of the body [or the unity of body and soul in one act of being], while also being able to argue for the intellectual operation not being an act of the body.

[439] Personal communication, email correspondence with S. M. Barr [February 4, 2020], who wrote: "now I am skeptical of the LP [Lucas-Penrose] argument. However, I still think that Gödel's Theorem(s) point to the immateriality of the human mind. At least, they undermine formalism and tend to support mathematical platonism." [words in brackets added by me to clarify].

interpretation] is a viable understanding of QM [quantum mechanics].[440] I now am more confident that MWI is NOT viable, because it has no way to relate the wave functions of systems to probabilities, i.e., it loses the Born Rule.[441]

In my discussion of Barr's work, I will omit his analysis of the Lucas-Penrose argument and will summarize only Barr's argument based on the orthodox interpretation of quantum theory. Before addressing quantum theory, though, I will begin with Barr's introduction to the question of the human intellect. The reason is that the unique powers of the intellect are key elements in his arguments.

5.1.1. The unique capacities of the human intellect

Barr begins the discussion of the difference between humans and purely material things by highlighting two capacities that are unique to the human being, namely, the intellect and free will: "Intellect is the power of reason, which allows us to understand ideas and to think abstractly. Free will is the power to make rational and free choices, which the medieval theologians defined to be 'rational appetite'."[442]

Barr discusses both the will and the intellect; however, I will bracket the question of the will and freedom of will, and will focus primarily on the question of the intellect. He sets the stage by asking the main question: "Can matter understand? Can the human intellect be explained in purely materialistic and mechanistic terms, or whether its capacities point to the existence of a reality that goes beyond the physical."[443] He starts by examining the *unique powers* of the human intellect and then offers a brief explanation of each of them. What is unique about the intellect is its power of *abstract thinking* and *conceptual understanding*, which is the ability to understand the meanings of abstract concepts and of the propositions that contain them. Secondly, the intellect has the ability *to judge* the adequacy of these concepts and the truth of these propositions.[444] That is, the intellect has not only the power of abstract understanding but also the power of judging the truth and falsehood of

[440] Words in brackets added by me to clarify.
[441] Personal communication, email correspondence with S. M. Barr [February 4, 2020]. He continues: "I have a 40-minute video on youtube that lays out my views: https://www.youtube.com/watch?v=qXUdlbPypzg" and attached his video from the 2018 conference of The Society of Catholic Scientists at the Catholic University of America.
[442] S. M. Barr, *Modern Physics and Ancient Faith, op. cit.*, p. 174.
[443] *Ibid.*, p. 190.
[444] *Ibid*.

propositions.[445] Moreover, the human intellect has the ability to attain certainty about some truth, and to recognize that some truths are true of necessity [e.g., 2+2=4, mathematical truth.][446] And finally, it has the power to recognize that some truths hold in an infinite number of cases.[447]

Abstract thinking is the ability to *universalize*, that is, to think of the general qualities of objects apart from particular instances. The human intellect abstracts or separates out particular characteristics of objects to form a universal or general concept, that is, it has the ability to understand how the same concept can apply to many individuals. Abstract thought grasps the common general qualities of many particulars [e.g., it grasps the circularity that is common to a round plate, a round table, a circle].

Because we can think of it apart from any of its individual instances, an abstract concept has an *unlimited reach* as it transcends the particularities of an object, and it is not bound by space or time, that is, abstract concepts transcend the limitation of the material universe. As Barr puts it, particular material objects "instantiate"[448] abstract concepts but they cannot contain the whole meaning of the universal. For example, a round dinner plate instantiates the concepts of circularity but it is limited by its material qualities [it is made from a certain material and exists in a certain time and space]. But circularity as a universal has no such limitation. As Barr further explains, the concept of circularity applies to circles of any size, proportion, orientation, and material: "Indeed, it applies even to circles in numbers of dimensions that cannot be "instantiated" in our physical world."[449] This notion of abstract thinking is familiar to us from Aristotle's and Aquinas' arguments that were discussed extensively in the earlier chapters of this work.[450] Both of them argue that matter or material bodies do not have the same capabilities as the intellect. Matter is always limited in some sense.[451] Following in footsteps of Aristotle and Aquinas, Barr argues that the characteristics of abstract concepts reveal that they cannot be material. This, in turn, indicates that, insofar as the intellect has the capacities of abstract thinking and conceptual understanding that

[445] *Ibid.,* p. 197.
[446] *Ibid.,* p. 200.
[447] *Ibid.,* p. 204.
[448] In other words, abstract concepts are instantiated in particular objects, e.g., the concept of circularity is instantiated in a round plate. However, particulars cannot contain the whole meaning of the universal, e.g., a round plate cannot contain the entire meaning of circularity, simply because it applies to many individual round objects.
[449] S. M. Barr, *Modern Physics and Ancient Faith, op. cit.*, p. 191.
[450] See my explication of Aquinas' arguments in Ch. 4 of this work.
[451] But I would add that despite its mysteries in modern physics, matter is still defined by its coordinates, time, space [velocity = d/t; momentum – mass x velocity], etc., and matter/energy is defined in quantum physics by momentum, mass, or Schrödinger's equation.

transcend the limitations of matter, it cannot be reduced to matter or a physical body. Or conversely, as Barr says: "because our brain is a finite material system, it cannot encompass within itself the whole meaning of an abstract concept."[452] A brain may have images that illustrate abstract concepts, or even words or symbols that stand for abstract concepts, but it cannot encompass the entire universal meaning of abstract concepts.

Another unique power of the intellect is c*onceptual understanding*, which is the ability to understand the *meaning* of abstract concepts and propositions that contain them. While many animals are capable of perceptual abstraction, which is the capacity to distinguish between patterns,[453] humans have also the capacity for *conceptual abstraction*, that is, they can think of a concept apart from any particular instance of it. They not only recognize patterns but also understand their meaning. They can relate concepts to other concepts, find relations between concepts, and prove theorems about them. For example, not only are humans able to understand what the concept of circularity means, but they are also able to relate it to other concepts and prove theorems about it.[454] To Barr's explanation, I would add that Aristotle's and Aquinas' distinction between sensitive and intellective knowing accounts for the difference between perceptual and conceptual abstraction.

Another key characteristic of the human intellect is *openness to truth*. This manifests itself in the ability to judge the adequacy of concepts and the truth or falsity of propositions [*rational judging*], and the ability to understand [to attain] the certainty of some *truth* and understand that some truths are true of necessity. In other words, it is the ability to distinguish that being certain of some truth is *not* the same as knowing that some truths are necessarily true. I can be certain of some truth – I know I am a woman, that my name is so and so – but I understand that some truths [typically mathematical truths] are necessarily true, e.g., the truth that 2+2=4 is the necessary truth.

The point of Barr's examples is to show that these key powers of the intellect [the capacity to understand universals or abstract concepts, openness to truth, the ability to attain certainty, the power to recognize that some truths are true "of necessity," and the power to recognize that some truths hold in an infinite number of cases] are beyond the capacity of any merely material system.[455] Nonetheless, as a scientist, when he discusses the question whether human faculties of intellect can be understood in purely physical terms, Barr is very careful in his analysis.

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[452] S. M. Barr, *Modern Physics and Ancient Faith*, *op. cit.*, p. 191.
[453] *Ibid*; "some species of fish can distinguish between circles and squares."
[454] *Ibid.*, p. 192.
[455] *Ibid.*, p. 204.

I would add that in order to prove that the intellect is purely physical, materialists would either have to disprove the existence of immaterial intellectual substances, which is practically impossible especially using scientific methodology, or show that matter can indeed think and understand the way human beings do. In other words, in order to prove that the human intellect is reducible to matter or a machine, it would have to be shown that matter or a physical body has the same intellectual powers as humans. Interestingly enough, although there have been many impressive developments in computer technology, it has not been shown that matter or physical bodies can think and understand the way humans can. Despite this, many people are so impressed with the powers of computers that they seem to forget that computers and their programs are, in fact, the products of human minds. As Barr points out, if the power of computers attests to anything, it does so to the amazing capacity of the human intellect to create them. What the computers exemplify is not that human intellect is a sophisticated computer but that it is the human intellect that has the capacity to create them. A quote from Barr best illustrates this point:

> "The reason that most calculating devices do operate in a manner consistent with logic and mathematical truth is that they were programmed to do so. That is, they have built into them a precise set of instructions that tells them exactly what to do at every step. These programs are the products of human minds. More precisely, the acts of understanding that lie behind these programs took place in human intellects.
>
> Rather than illustrating, therefore, how an automatic device can give rise to intellect, artificial computers merely show that an intellect can give rise to a device. Not only do the design and programming of these devices occur as the result of human acts of understanding, but the meaning of their outputs can only be apprehended by human acts of understanding, not by the machines themselves. (These outputs can indeed be used by other machines, but only by machines designed to be able to do so by human intelligence.)"[456]

Furthermore, Barr continues: "The point at which any task has become routinized so that it no longer requires acts of understanding is the point at which it can be done by a machine which lacks intellect."[457] The routine execution of tasks is the basis of the operation of computers – a computer follows a set of algorithms that were initially programmed by a

[456] *Ibid.*, p. 198.
[457] *Ibid.*, p. 199.

human being; however, as Barr emphasizes, there is huge difference between *following a procedure* and *understanding the meaning* of each step involved in that procedure: "It is important to keep in mind that there is a distinction between being able to manipulate symbols correctly according to some prearranged scheme and understanding the meanings of those symbols."[458]

Nonetheless, some people argue that since computers can prove theorems they have conceptual understanding – they understand. This brings up the questions of what it is to understand and in what sense computers are said to understand. Materialists who claim that computers understand interpret the notion of understanding as the ability to manipulate information to accomplish a certain task.[459] I would add that this is a very truncated and highly utilitarian interpretation of understanding. Clearly, humans can engage in abstract reasoning that does not have practical use.

The work of computers is to manipulate symbols and numbers and they do it extremely well; however, they do not understand the meaning of those symbols and numbers. Symbols represent a concept but they are not concepts.[460] And the incredible progress in the field of computer deep-learning does not change the fact that it is humans who not only program but also understand the meaning of the concepts. I will not continue with the question of whether the computer's power to perform even highly complicated functions is the same as human intellectual power.

5.1.2. Quantum theory

Before addressing quantum phenomena and the role of the observer, I must make a disclaimer. I am neither a physicist nor a mathematician; therefore, I will rely on Barr's explanation of quantum theory and his argument about the role of the observer in quantum phenomena. Barr's argument provides an example of how the orthodox interpretation of quantum physics reflects insights of Aquinas' arguments for the non-physical nature of the human intellect. Barr acknowledges the scientific assumptions of the argument, specifically its heavy reliance on the notion of probability and wavefunction.

[458] *Ibid.,* p. 209.
[459] *Ibid.,* p. 192.
[460] *Ibid.*

The discovery and development of quantum theory at the beginning of the 20th century [1900-1925][461] led to a dramatic change in the field of physics, which until that time had been dominated by Newtonian physics. The theory of quantum mechanics is revolutionary because it is not a theory of this or that phenomena but is an entirely new theory of physics.[462] It is, moreover, a very successful theory of science.[463] Its power lies in the simplicity and elegance of its mathematical formalism, in its empirically testable predictions [testability], and in its technological applications [e.g., lasers].

Nonetheless, the observations of quantum physics about the world seem strange, especially when compared to classical physics. The reason is that we live in the macro world of classical physics. Even though at the subatomic level we are governed by the laws of quantum mechanics, at our macro level, it is the deterministic laws of Newtonian physics that predominate our dealings with the world. This, to some extent, allows us to feel in control not only over our knowledge of the universe but also of our transactions with it. This comfortable attitude toward the universe has, to some extent, been undermined by quantum physics, but the real difficulty with accepting quantum theory lies in its philosophical implications. In fact, even scientists who contributed to its discovery and development [e.g., Einstein, Schrödinger] found some of its aspects deeply unsettling.[464] This unease led to other interpretations of quantum theory, for example, hidden variables, Bohm's pilot wave theory, the Many Worlds Interpretation [MWI].

One reason for this discomfort is that, in contrast to classical physics, quantum physics is inherently probabilistic. This is manifested in the lack of exact knowledge of the state of the physical system between measurements – in Heisenberg's words: "the concept of the

[461] *Ibid.,* p. 227. "The list of those who contributed key insights is awe-inspiring: Max Planck, Louis de Broglie, Albert Einstein, Niels Bohr, Erwin Schrödinger, Werner Heisenberg, Max Born, Wolfgang Pauli, Paul Dirac, John von Neumann, and a host of lesser, but still brilliant, lights."

[462] "Quantum mechanics is a physical science dealing with the behaviour of matter and energy on the scale of atoms and subatomic particles/waves. It also forms the basis for the contemporary understanding of how very large objects such as stars and galaxies, and cosmological events such as the Big Bang, can be analyzed and explained. Quantum mechanics is the foundation of several related disciplines including nanotechnology, condensed matter physics, quantum chemistry, structural biology, particle physics, and electronics." Science Daily – Introduction to Quantum Mechanics [https://www.sciencedaily.com/
terms/introduction_to_quantum_mechanics.htm].

[463] S. M. Barr, *Modern Physics and Ancient Faith*, *op. cit.*, p. 227. "In many cases its predictions have been tested to astonishing accuracy. For example, quantum electrodynamics has been the most precisely tested theory in all of science. The theoretical and experimental values of "anomalous magnetic moment" turned out to be extremely close to each other."

[464] For example, Einstein never came to terms with its philosophical implications. Schrödinger, who is responsible for the famous Schrödinger equation that allows calculation of the evolution of the wave function over time, was also quite unhappy with the philosophical implications of quantum mechanics.

probability function does not allow the description[465] of what happens between two observations."[466] There is also the problem of finding an overarching (unified) theory that would accommodate both the theory of quantum mechanics and Einstein's theory of general relativity. However, it seems that the primary reason for the discomfort over quantum theory, and particularly its standard (Copenhagen) interpretation, is the role the observer plays in quantum phenomena – specifically, what it is about the observer that leads to the collapse of the wavefunction.

Barr acknowledges that the "observer argument' is disliked by many physicists. It is intellectually uncomfortable because it seems to push the question of the nature of the observer beyond the boundaries of physical sciences. Consequently, many scientists choose to either ignore it or to argue it away by proposing other interpretations. However, there are a number of scientists who not only try to understand the philosophical implications of the role of the observer, but who also argue that it points to the non-physical character of the human intellect – in fact, Barr says that the observer argument has: "a long and distinguished pedigree."[467] Nonetheless, the role of the observer is considered controversial because quantum theory continues to be debated,[468] and thus it is impossible to base any firm philosophical conclusions on its present structure. Still, in view of the ongoing success of the Copenhagen interpretation, it seem reasonable to take another look at the problem of the observer. And this is exactly what Barr does. While relying on previous insights, he argues that the role of the observer in quantum phenomena indicates the non-physical nature of the human intellect. In fact, as I have already mentioned, Barr is even more convinced of this conclusion, just as he is even less impressed with the Many Worlds Interpretation.[469]

I decided to follow Barr's argument quite closely. Since I am not a scientist, I need to rely on expert analysis of the issue by those who are more qualified.[470] His explanation of the

[465] Heisenberg reserved the term 'description' to denote definite knowledge like the one possible in classical physics.
[466] W. Heisenberg, *Physics and Philosophy – The Revolution in Modern Science,* New York, 1962, p. 26. "The concept of the probability function does not allow the description of what happens between two observations." We cannot describe what happens in between observations because we do not have exact knowledge.
[467] John van Neuman [mathematician], and physicists Sir Rudolph Peierls, Eugene Wigner, Fritz London, Edmond Bauer, and most recently, Henry Stapp.
[468] The theory of quantum mechanics continues to be debated. There are 14 listed interpretations of quantum mechanics in Wikipedia.
[469] My personal communication with Barr via email.
[470] Nonetheless, even if one is not a physicist or mathematician, there are some fundamental concepts in quantum mechanics that are accessible to a layperson.

principles of quantum theory follows to some extent Heisenberg's explanation of the Copenhagen interpretation.[471]

It seems that the easiest way to be introduced to the strange world of quantum physics is by a brief comparison to some basic ideas from classical physics. The fundamental difference between classical and quantum physics is that if classical physics is considered to be deterministic, quantum physics is fundamentally probabilistic. If in classical physics calculations indicate what will happen,[472] in quantum physics calculations point to what might happen and the relative probabilities of it doing so.[473] Thus, in classical physics events are considered to be actual, but in quantum theory there are only hypothetical possibilities of an outcome. Calculation in classical physics gives a definite outcome, but calculation in quantum theory yields only probabilities.

Obviously, if we can have certain knowledge, we do not need to calculate probabilities; hence, probabilities are a measure of ignorance. Moreover, it is important to remember that probabilities are probabilities of an outcome, that is, probabilities have meaning only in relation to an outcome. And this is also true of probabilities in quantum theory. Barr clearly states: "probabilities that are computed in quantum theory are the probabilities of outcomes of measurements."[474]

The key difference between the deterministic character of classical physics and probabilistic nature of quantum physics is reflected in the different *basic quantities* they use - a set of *coordinate*s in classical physics, and *probability amplitudes* in quantum physics. Barr's example illustrates it very nicely. Let's say we are dealing with a moving particle. In classical physics we calculate where the particle is at any given moment. The basic quantities used are the coordinates of a position and momentum. As the particle moves through space the numerical values of its coordinates change, and the 'equations of motion' are used to calculate the position of particle in space at any given time. But insofar as quantum theory is fundamentally probabilistic, the equations of quantum theory do not tell where the particle is but where it might be found. The basic quantities used in quantum physics are probability amplitudes. They are used to calculate the relative probabilities that the particle will be found in various places. The probability amplitudes make up the so-called 'wavefunction' of the

[471] W. Heisenberg, *Physics and Philosophy…*, *op cit*., p. 18-32.
[472] If we had all the information about the system, we could, in principle, calculate its exact state in the future. Although possible in principle, this is not exactly feasible because we cannot ever have all the information about the system.
[473] S. M. Barr, *Modern Physics and Ancient Faith*, *op. cit.*, p. 229. "Occasionally, one finds that the probability of something happening is 100 percent. But those are special situations."
[474] *Ibid.*, p. 230.

particle, which evolves continuously in time according to the Schrödinger equation.[475] Basically, in quantum physics, we cannot calculate the exact position and momentum of the particle but only the relative probabilities of finding it at a certain place in time. This impossibility of knowing the exact position and momentum of the subatomic particle at the same time is expressed by Heisenberg in his famous Uncertainty Principle.[476]

To be fair, probabilities are also used in classical physics. This is because we do not live in the world that is governed entirely by the laws of classical physics, and moreover, it is not possible to have complete knowledge of the physical world. Nonetheless, in classical physics it is possible to predict the behavior of a physical system, often with a high degree of accuracy. Thus, the use of probabilities in classical physics is typically a matter of convenience or an accommodation to practical limitations. As Barr explains it:

> "There is, then, a profound difference in the way probability enters in the two frameworks. In the classical framework, the use of probability is not in principle necessary, whereas in the quantum framework it is. In quantum theory the probability amplitudes are at the very heart of the mathematical description of physical reality."[477]

But this fundamental difference between classical physics and quantum theory points to the next dilemma, namely, *the transition from probabilities to a definite outcome*. We live in the world of actual events. But if all that can be done in quantum theory is to compute the probabilities of an outcome, the question becomes how we connect them to the real outcome. That is, *when does the probability of an outcome become a definite outcome*? What connects

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[475] *Ibid.*, p. 234.

[476] W. Heisenberg, *Physics and Philosophy…*, *op cit.*, p. 18-33. It is interesting to follow Heisenberg in his explanation of the Copenhagen interpretation. The uncertainty is due to our inability to measure at the same exact time both the position and momentum of the particle. Heisenberg believes this uncertainty is connected with the limitation of our knowledge. He believes we cannot know reality in itself. Our knowledge of reality is always limited or circumscribed by science and instruments we have at any given time.

This is very different from Aquinas' realistic position. According to Aquinas's realism, we do not just know our concepts, rather, through our concepts we know reality itself. However, our knowledge is limited, that is, we do not have a total and perfect knowledge of reality – only God, who is pure understanding, does. Our progress in science reflects the fact that we can continue to discover new things in the physical world. Moreover, we can know the world because the world is intelligible. Its existence and intelligibility is not dependent on our minds and our theories, it is independent of us. We do not create its being or intelligibility, but we discover it through our senses and can form concepts about it.

[477] S. M. Barr, *Modern Physics and Ancient Faith, op. cit.*, p. 234.

the realm of *hypothetical possibilities* to the realm of an *actual event* in the world? When does the hypothetical possibility get recognized as a fact or not a fact in the real world?

According to the traditional [Copenhagen] interpretation of quantum theory, the transition from hypothetical to actual [from probabilities to a definite outcome], happens in an *act of measurement or observation*. Until the measurement is made, the isolated system is described by probability amplitudes that evolve in time by the Schrödinger equation. However, when a measurement or observation is made on the system, there is a 'collapse of the wavefunction', which Barr explains: "It is essentially the point at which the probabilities get turned into certainties."[478] At that moment, the probability of the actual outcome jumps to 100 percent, and the probabilities for all other outcomes fall to zero. For example, Barr explains, in the case of a radioactive nucleus, this means that the nucleus decayed or did not decay: "an observation of one nucleus designed to see whether it has disintegrated must yield one outcome or the other".[479] In other words, only one of all the hypothetical possibilities becomes one actual event.[480]

Barr relies on the traditional analysis of the collapse of the wavefunction that was developed by von Neumann. Since this analysis is important for 'the observer' argument, I decided to follow it closely. According to this analysis:

> "the wavefunction and the probability amplitudes it contains change in two radically different ways: (1) the Schrödinger evolution of the wavefunction, and (2) the collapse of the wavefunction."[481]

According to traditional analysis,[482] in between the measurements, the wavefunction of an isolated system evolves in a continuous way according to the Schrödinger equation. The

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[478] *Ibid.*, p. 236.

[479] *Ibid.*, p. 235. Barr explains how predictions in quantum physics are made: "for example, mathematical calculation predicts that at 3:45 pm there is a 92.568 percent chance of the nucleus having decayed and 7.432 percent chance of it still being there. But if one actually looks at 3:45 pm, one result or the other would be found. One is not going to find of this particular nucleus that it is 92.568 percent decayed. It has either disintegrated or it has not. So how does one test the prediction of the theory that gave the probability as 92.568 percent? By looking at a very large statistical sample of nuclei of the same type: after three hours and forty-five minutes it should be found that 92.568 percent of them have disintegrated. But an observation of one nucleus designed to see whether it has disintegrated must yield one outcome or the other."

[480] In quantum theory, after the observer has learned the outcome, the probabilities are no longer the same as they were before he learned the outcome, which means that "after the measurement the old function must be replaced by a new function that reflects the observers' newly acquired knowledge." *Ibid.*, p. 236.

[481] *Ibid.*, p. 236-237.

evolution of the wavefunction is smooth and predictable which means that if we know probability amplitudes at one time, we can, in principle, calculate their future values[483] (which, again, is not the same as calculating a particle's exact position). But when the observer, who is *outside the system*, performs a measurement or observation on the system to determine one of its properties, then the probability amplitude for the real outcome jumps to 100 percent, and for all other unrealized outcomes falls to zero percent. Whereas before the observation, the evolution of the function is smooth and predictable, the collapse of the wavefunction is sudden and unpredictable. That is, if we know the probability amplitudes before the measurement, then it is possible, in principle, to calculate their future values. However, it is *impossible* to calculate in advance which probability amplitudes will jump to 100 percent and which to zero. This depends on the actual outcome of the measurement or observation.[484] Barr states:

> "To repeat once more the heart of the argument: If the "collapse" of the wavefunction to a definite result were computable by the Schrödinger equation, then that definite result would be computable in advance. But that is not possible, since the Schrödinger equation only gives probabilities."[485]

Barr adds that it is important to note that in quantum theory, while a measurement makes some properties more certain [those that are being measured more certain], it makes other properties less certain. The most typical example is that it is impossible to know the exact values of both position and momentum at the same time. However, this problem does not get solved by making more measurements on the system. That is, even if we make more measurements, we will know more about one aspect of the system but know less about its other aspects. This unsettling feature of quantum system is implied in Heisenberg's

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[482] Barr credits von Neuman with this interpretation of the analysis of the collapse of the wavefunction.

[483] S. M. Barr, *Modern Physics and Ancient Faith*, *op. cit.*, p. 236-237. "In between observations, if a system is undisturbed, its wavefunction evolves in a continuous way which is governed by the Schrödinger equation. This evolution is smooth and predictable, in the sense that if the probability amplitudes are specified at one time, their values are computable, in principle, at later times."

[484] *Ibid.*, p. 236. "When an observer who is outside the system performs some measurement or observation of it to determine one of its properties, then some probability amplitude (that for the actual outcome) jumps to 100 percent, and the others (for the outcomes that were not realized) jump to 0 percent. This collapse is sudden, but more importantly it is—unlike the Schrödinger evolution—unpredictable. The collapse is unpredictable since which probability jumps to 100 percent and which jump to 0 percent depends on the actual outcome of the measurement or observation, and that is not predictable in advance."

[485] *Ibid.*

Uncertainty Principle."[486] As Barr points out, probability is a fundamental aspect of quantum theory that cannot be eliminated.

In summary, the probabilistic character of quantum theory makes it impossible to predict the outcome of the measurement, that is, there is no way of computing in advance which probability amplitude will become the actual outcome. Barr emphasizes that the actual outcome [the definite outcome] is dependent on measurement, more specifically, on observation: "the crucial point is that only by talking about measurements made on systems, and the outcomes of those measurements, does it seem to be possible to make sense of the mathematical formalism of quantum theory."[487]

5.1.3. The observer

This puzzling aspect of quantum theory brings up the questions of the nature of these measurements and who or what performs them, leading us to *the role of the observer in quantum phenomena*. The role of the observer in classical physics is very different from that in quantum theory. Insofar as classical physics deals only with physical systems, the observer does not play an important part of the measurement or calculation. However, in quantum theory the observer must be taken into account. The reason is that, by making a measurement or observation, the observer interferes with the system. But who or what is the observer in quantum theory? Can the observer be a be purely physical entity or is there something else that is required for the observer to be the observer, that is, for it to be able to get a definite outcome?

According to scientists such as von Neumann, London, Bauer, Wigner, and Peierls, the observer, as one who produces the definite outcome, *cannot* be a part of the purely physical system.[488] The reason is, explains Barr, that a purely physical instrument cannot give a definite outcome: "the problem lies in trying to give a complete mathematical/physical

[486] *Ibid.,* p. 237. Barr further explains, "There are properties of every physical system that are said to be "conjugate" to each other: the more certainly one is known, the less certainly the other is known. For example, if one measures the position of a particle in space, its position becomes better known, but its momentum becomes less well known. But could one just keep making more and more measurements of a system until everything about it is known with certainty, and then perhaps dispense with all these 'probability amplitudes'? The answer is no. Any measurement will produce greater certainty about some aspects of the system, but other aspects will become more uncertain."
[487] *Ibid.,* p. 235.
[488] *Ibid.,* p. 237. What is interesting is that the observer, as one who produces the definite outcome, cannot be a part of the purely physical system.

description of the entire process through which the observer obtains the outcome of the measurement."[489]

Barr illustrates the problem with a simple example. We want to use a camera to capture on film a particle that is moving in space. If a particle is in a given place [e.g., A] and the camera takes a picture, the image of the particle will appear on some corresponding place of the film [A']. And if a particle is in place [B], the image of the particle will be at corresponding place on film [B'], and so on. Even though the camera captures on film different places where the particle is, this is all that it does. It still does not produce a definite outcome.

But why it that? The quick answer is that, as long as we are dealing with an entirely physical system, we are always dealing with hypothetical possibilities of an outcome but never with an actual outcome. If the system is expanded to include not only the moving particle but also the camera and the film [a meta-system], it is still a purely physical system, which means that its components are described by a wavefunction, that is, in terms of probabilities. The probability amplitudes will tell us that there is some probability [for example, P(A)] that the particle is at position A and that its image is at A', and that there is some probability P(B) that the particle is at B and its photographic image is at B'; however, Barr says: "it won't tell us which of those cases is actually realized."[490] In short, as the physical system gets expanded, its mathematical description also gets expanded to include all of its components. All of the components become a part of continuous Schrödinger evolution of a wavefunction and everything is trapped in the realm of probabilities. There is no external observer to collapse the function and thus there is no definite outcome. As Barr explains: "the 'collapse' of the wavefunction always takes place only outside the 'system,' which we describe in detail, and belongs to the 'observation' of the observer, which is not part of our description."[491] Interestingly though, the boundary between the system and the observer cannot be entirely removed. Even if, in principle, the boundary between the observer and the system could be moved to include all physical aspects of the observer,[492] for the observer to be the observer, he cannot be brought entirely into the system. Again, the reason is that his behavior would be described by a wavefunction in terms of hypothetical possibilities.

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[489] *Ibid.*, p. 238.
[490] *Ibid.*
[491] Peierls, quoted in *ibid.*
[492] The quantum description of such a complex system would be basically impossible because of the complexity of the calculations [*ibid.*, p. 241].

Thus, there are two points to be made with regard to this: first, the collapse of the wavefunction requires an *external observer*; and second, *the observer cannot be physical*, because then it would be a part of a physical meta-system. As a part of a physical meta-system, a physical observer would be described by a wavefunction [or density matrix] of its own. It would be locked in the realm of probabilities. But being so trapped it could not collapse the wavefunction.[493] This leads to the conclusion that the mathematics of quantum physics requires that the observer is external to the system of mathematical descriptions.[494]

The second point regards the nature of the observer. In an act of observation, only one of the hypothetical possibilities becomes a definite outcome, and all other hypothetical possibilities become irrelevant. But how is it that the act of observation results in a definite outcome? The fact that getting a definite outcome requires an observer that is external to the system reveals something about the act of observation and the observer. The act of observation, in which the definite outcome is obtained, is an act of judging. And as such it is an act of the human intellect because it is the intellect that makes a judgment about the outcome – it is the intellect that knows that such and such has happened. If the intellect were a part of a physical meta-system, it would have to be described in terms of a wavefunction. And not being an external observer, the human intellect would never get the definite outcome and it would be trapped forever in the realm of hypothetical possibilities. This means the human intellect, as that which knows the definite outcome, cannot be physical. The act of judging the definite outcome [that outcome is such and such] can only be accomplished by the observer that can understand. This is also the reason that a purely physical entity such as a detector or a robot cannot be the observer.[495]

Barr admits that the above analysis of the observer relies heavily on the use of the wavefunction. But when macroscopic objects [camera, eyeball] enter the scene, the wavefunction is not adequate because it does not describe what happens, and so-called density matrix formalism is used instead. Also, when macroscopic objects affect the system, what is termed decoherence happens, that is, parts of the wavefunction or density matrix that represent different possible outcomes decohere from each other (they lose quantum

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[493] *Ibid.*, p. 238-239. "In short, the observer cannot be considered part of the system that is being physically described and remain the observer of it. Just as you cannot be in the movie and watch it at the same time, you cannot be entirely part of the system and observe it too. You cannot be described completely by the wavefunction and also collapse it. In traditional quantum theory one is led to the following fundamental conclusion: The mathematical descriptions of the physical world given to us by quantum theory presuppose the existence of observers who lie outside those mathematical descriptions."

[494] *Ibid*.

[495] *Ibid.*, p. 237 – 240.

coherence). However, Barr explains that this does not affect the central point of the argument, namely, that the calculation of quantum theory, whether it is the wavefunction or the density matrix, does not tell you which outcome is going to happen. One is still left with possibilities but not with the actual outcome. Similarly, decoherence points to different possible outcomes but does not give you a definite outcome. In Barr's words:

> "It remains the case that the evolution given by the equations of quantum theory, whether one is speaking of a wavefunction or of a density matrix, does not tell which outcome is actually going to happen. The actual "collapse" is not merely a matter of decoherence, it must result in a definite actual outcome, and therefore cannot be given by the equations of standard quantum theory."[496]

Barr's argument for the non-physical nature of the observer can be summarized as follows:

– A measurement of an isolated quantum system results in the collapse of the wavefunction;

– In order to get collapse of the wavefunction, the observer must be external to the system – that is, the observer cannot be a part of a system [meta-system] because it is then trapped in the realm of hypothetical possibilities [probabilities];

– The observer is the one who knows the definite outcome [and only an observer that can understand can know];

– Knowing is the act of judging;

– The act of judging is the act of the intellect;

– Thus, the external observer, as one who can know the definite outcome must be non-physical.

– This indicates that the human intellect, as that which judges and knows the definite outcome, is non-physical.

5.1.4. Some controversies

The Copenhagen interpretation of quantum theory points to the role that the mind or some aspect of it plays in quantum phenomena. There are different ideas about the nature of the mind and how it affects quantum phenomena, but a number of physicists agree that the

[496] *Ibid.*, p. 241.

mind cannot be reduced to a physical description.[497] Still, most scientists dislike the idea that the mind is somehow involved in quantum phenomena. Barr quotes Euan Squires:

> "It is probably fair to say that most members of the physics community would reject [these] ideas.…[However], their reasons would be based more on prejudice than on sound argument, and the proportion of those who reject it would be much smaller if we considered only those who had actually thought carefully about the problems of quantum theory."[498]

No matter how one looks at it, quantum theory is admittedly strange. Barr warns that this can lead to some misunderstandings and paradoxes.[499] One misguided but fairly common notion is that our act of observation [measurement] changes reality. This notion rests on the idea that the wavefunction represents the state of the natural world. If that were the case, the collapse of the wavefunction would mean a change in the state of the natural world – a change that is brought about by our measurement. Barr continues: "and since that measurement is consummated (according to von Neuman's analysis] by the observer becoming conscious of its outcome, it would, indeed, seem in quantum theory 'thinking makes it so', that is, the mind makes this outcome - we have changed the state of the natural world."[500] Barr explains that in order to avoid this kind of misunderstanding, instead of thinking of the wavefunction as representing the state of the natural world, it is better to think of it as representing *the state of our knowledge of the world*.[501] In fact, this is how Heisenberg, in his early writings, interprets the mathematics of quantum theory: it "represents no longer the behavior of elementary particles, but rather our knowledge of this behaviour."[502]

Furthermore, thinking of the wavefunction as representing one's state of knowledge deals with some paradoxes of quantum theory. One of these paradoxes is called Wigner's

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[497] *Ibid.,* pp. 241-242. "That the mind is a fundamental reality that is not reducible to physical description was clearly stated by Fritz London and Edmond Bauer, and later defended by Sir Rudolf Peierls and by Eugene Wigner as we have just seen. Henry Stapp of the University of California at Berkeley and Euan Squires of the University of Durham in England are the physicists who have recently argued most forcefully for this point of view. Each has proposed interesting theories about the nature and role of the mind that are based on the ideas of quantum theory."
[498] *Ibid.,* p. 242.
[499] *Ibid.,* pp. 242-244.
[500] *Ibid.,* p. 242.
[501] *Ibid.*
[502] W. Heisenberg, *Daedalus 87,* 1958; quoted by Wigner, Symmetries and Reflections, 172; quoted by S. Barr in ibid., p. 243.

friend paradox.[503] The question is: if there are several observers of the same system, which one collapses the wavefunction, i.e., which one is the observer? Wigner asks his friend to watch over his experimental apparatus that is set up to detect radioactive decay of a nucleus. While Wigner is absent, his friend sees that the nucleus decayed. Then Wigner comes back to the lab. Who is the observer, who collapsed the wavefunction – Wigner or his friend? There are two ways of looking at this situation: in one Wigner is the observer, in the other his friend is the observer. If Wigner regards his friend as part of the experimental apparatus then the wavefunction does not collapse until Wigner knows the outcome. On the other hand, his friend can think of himself as the observer and he collapses the wavefunction as he gets the outcome. There are two people making a measurement on the same system, so which one is the observer, which one collapses the wavefunction?[504]

Barr explains that this paradox is resolved if the wavefunction is thought of as representing one's state of knowledge. In this case there are two states of knowledge, one of the friend and one of Wigner, and each one is represented by a wavefunction. But even though the wavefunction represent one's state of knowledge, it should not be thought of as one's personal possession, but rather, argues Barr: "as representing all the information that can be said about the system given prior observations. Then if two people have the same information about a system they would employ the same wavefunction to describe it."[505]

Nonetheless, Barr adds, if the wavefunction is thought to represent one's knowledge, then if there are two observers, there are two wavefunctions. One criticism of this understanding of the wavefunction is that it can lead to subjectivism. There would be no objective knowledge of reality but, in this case, Wigner's knowledge and his friend's knowledge. However, Barr argues, if different observers honestly compare notes about the same physical facts, they will be in agreement with each other. Thus different observers can study the same system, and if they do it properly their data will be consistent. I would add that this is possible because, in order to draw correct conclusions about the object they study, scientists have to repeat the same kind of experiment multiple times and collect large amounts of data. Although their respective state of knowledge is subjective, it contributes to the larger amount of data, and if different data are compared and are consistent, then it says something objective about the system under study.

[503] S. M. Barr, *Modern Physics and Ancient Faith, op. cit.,* p. 243-244.
[504] *Ibid.*
[505] *Ibid.*

In any case, interpreting data in quantum physics is not as straightforward as it is in classical physics. Barr emphasizes that, whereas in classical physics scientists are able to describe the state of system ['what is happening'], in quantum physics the description of the same physical state is a combination of: "what different observers are in a position to know about what is happening".[506] In classical physics, to the extent that different observers can, in principle, obtain the same data about the system, the knowledge of the state of the system is not dependent on an individual observation. By contrast, in quantum system, the knowledge of the state of the system depends on the individual observer – the state of the system is contained in the state of knowledge of an individual observer.

The discomfort with the probabilistic character of the Copenhagen interpretation led to several physicists suggesting modifications or to development of other interpretations of quantum theory.[507] Einstein believed that the use of probabilities reflects our lack of information about the system. De Broglie and Bohm suggested the pilot wave version of quantum theory, which is not very popular because of its elaborate mathematics. Basically, they tried to explain quantum phenomena by going back to classical physics.[508] Hugh Everett proposed yet another interpretation in 1957, which at present goes by the name of the Many Worlds Interpretation.[509] It is propounded especially by those who dislike the idea of the wavefunction collapse. According to MWI, there is no collapse of the wavefunction; rather, the probability amplitudes that make up the wavefunction represent different branches of reality. All of them exist and we can exist in each of them; however, we cannot know the lives we have in any other branches of reality. For example, I can be a painter in one, a scientist in another one, or an astronaut in yet another one, but I cannot traverse between the different branches of reality. One of the main problems with this interpretation is that it cannot be empirically tested. If you cannot know more than one branch or reality, how can you even test empirically that other branches exist? MWI seems to be based more on wishful thinking than on empirical science. Nonetheless, MWI is popular, especially with proponents of physicalism, because it eliminates the problem of the observer and thus the question of the nature of the mind.

5.2. Philosophical implications of the observer

[506] *Ibid.*, p. 244.
[507] *Ibid.*, p. 246-250.
[508] *Ibid.*, p. 247.
[509] *Ibid.*, p. 248-250.

5.2.1. Epistemological versus metaphysical views of the wavefunction

The philosophical implications of the observer present some questions: for example, what happens is if there are no conscious observers to collapse the wavefunction? Does this mean there is no collapse? John Polkinghorne puts it the following way:

> "Consciousness is a late arrival on the cosmic scene. Are we to suppose that, for billions of years, no quantum process ever had a definite outcome? If a measurement is made and recorded on a computer printout, which is not read by anyone for many months, are we to conclude that until that time of reading there was no definite imprint on the paper?"[510]

Can a purely physical system collapse the wavefunction? It seems that if the collapse of the wavefunction refers to knowing the definite outcome, then the answer would be no, the purely physical system cannot cause the collapse. But more interesting is Barr's question, namely, if the human kind of consciousness had not arisen in the universe, *what would the wavefunction refer to*?[511] If the question is phrased this way, the emphasis is not so much on the meaning of the wavefunction collapse as on the meaning of the wavefunction itself. In quantum theory, a wavefunction is a mathematical equation that represents the continuous evolution in time of the physical system. It is made up of probability amplitudes, that is, it represents all possible states [superposition states] of that system in time. It is about the probabilities of locating a particle.[512]

But there seem to be two ways of looking of what the wavefunction represents: epistemological and metaphysical. In the epistemological view, the wavefunction represents one's state of knowledge, or rather, one's lack of the exact knowledge about the system [probabilities are about ignorance]. The collapse of the wavefunction refers to the definite outcome known by the external observer. The outcome is definite in the sense that out of many hypothetical possibilities, only one becomes the outcome and the rest become

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[510] J. Polkinghorne, *Quantum Mechanics*, Rome, 2002, p. 6.

[511] S. M. Barr, *Modern Physics and Ancient Faith*, *op. cit.*, p. 244.

[512] "A wave function in quantum physics is a mathematical description of the quantum state of an isolated quantum system. The wave function is a complex-valued probability amplitude, and the probabilities for the possible results of measurements made on the system can be derived from it." Wikipedia, Wave function, https://en.wikipedia.org/wiki/Wave_function.

irrelevant. Even though a measurement always involves some uncertainty,[513] at the moment of observation the observer knows something concrete about the system; in a sense, he 'arrests' it at that moment, and from then on the system must be described in terms of a new wavefunction. If the wavefunction represents an individual's state of knowledge of the system, then it would seem that, if there is no human consciousness and no observer with at least the human capacity to know, then the question of what the wavefunction would refer to seems irrelevant.

The question of knowledge is relevant only insofar as there is someone that has the capacity to know. Insofar as collapse refers to obtaining the definite outcome, there would be no collapse. If there is no observer, there is no one to know, there is no definite outcome. If humans are the only intelligent beings in the universe, then before humans there would be no knowledge of the world. The world would continue in its being without ever being known. Unless of course we posit the existence of other intelligent beings [God, angels, extraterrestrial intelligent beings].

At first, Heisenberg is in favor of the epistemological interpretation, that is, he thinks that the mathematics of quantum theory reflects our state of knowledge and is always dependent on our methodology, our instruments, and our scientific knowledge.[514] Heisenberg states:

> "we can, for instance, predict the probability for finding the electron at a later time at a given point in the cloud chamber. It should be emphasized, however, that the probability function does not in itself represent a course of events in the course of time. It represents a tendency for events and our knowledge of events. The probability function can be connected with reality only if one essential condition is fulfilled: if a new measurement is made to determine a certain property of the system. Only then does the probability function allow us to calculate the probable result of the new measurement. The results of the measurement again will be stated terms of classical physics. Therefore, the theoretical interpretation of an experiment requires three distinct

[513] This uncertainty of measurement is captured in Heisenberg's Uncertainty principle "that states there is an inherent limitation to how precisely we can know both the position and the momentum—or energy—of a particle at a given time. That is to say, the more precisely we know the position of an electron, the less we know about its momentum, and vice versa. Thus, we can never know both where an electron is and its energy all at the same time" [from the Khan Academy]. My question is what inherent means exactly. Does it mean *inherent* to the measurement and thus a result of the limitation of the apparatus, or does it mean *inherent* to the quantum system?

[514] W. Heisenberg, *Physics and Philosophy…*, *op. cit.*, p. 20-21.

steps: [1] the translation of the initial situation into a probability function; [2] the following up this function in the course of time; [3] the statement of a new measurement to be made of the system, the result of which can then be calculated from the probability function. For the first step the fulfillment of the uncertainty relations is a necessary condition. The second step cannot be described in terms of the classical concepts: there is no description of what happens to the system between the initial observation and the next measurement. It is only in the third step that we change over again from the 'possible' to the 'actual'."[515]

Later, however, Heisenberg seems to favor a metaphysical interpretation of quantum phenomena.[516] He rejects metaphysics based on classical physics and comes up with his own metaphysics. That is, he is absolutely against the deterministic, or as he calls it, the materialistic account of physical reality of classical physics with regard to quantum phenomena. But he seems to agree with Kant that we simply cannot know reality in itself, and proposes his own metaphysical view of quantum theory in which he stresses the indeterminate nature of the quantum world. This switch from the interpretation of the wavefunction as referring to one's state of knowledge to the view that it represents the quantum world itself seems to be reflected in his move from using the term Uncertainty principle to Indeterminacy principle.

I would add that accepting Heisenberg's metaphysical view of quantum theory leads to interesting conclusions. If the wavefunction refers not to the state of our knowledge but to the mathematical representation of the quantum world, this implies that the nature of the quantum world is mathematical. And to the extent that physical reality is at its very foundation governed by quantum reality, then physical reality at its very foundation is mathematical. This further suggests that the better the mathematical theory, the more we know the true nature of reality. But in this interpretation, mathematics is not just a tool to model and discover reality but it is reality itself – reality is mathematical.

The metaphysical [or ontological] interpretation of the wavefunction also provides a simple answer to the question of what the wavefunction would refer to in the absence of the human intellect: it seems the absence of intellect would not matter. Insofar as the wavefunction, which is a mathematical equation, is thought to represent the quantum system and thus all physical reality, in that case, reality is mathematical, with or without observers.

[515] *Ibid.*
[516] J. Polkinghorne, *Quantum Mechanics, op. cit.*, p. 2.

The problem of the nature of reality is, to some extent, solved; however, the question of who, without the human intellect, would have solved this question remains, or for whom it would be meaningful to solve it.

To sum up, there are two main 'interpretation camps' of the probabilistic nature of quantum mechanics. One camp believes that its probabilistic character is due to the uncertainty in our knowledge (epistemic)[517], the other claims that it manifests the indeterminate character of reality (metaphysical). The latter interpretation is winning at this point; however, not everyone agrees with this assessment. As John Polkinghorne points out, "science, by itself, cannot adjudicate between epistemic and ontological interpretations of the probabilistic nature of quantum mechanics."[518] In other words, the different interpretations of quantum mechanics have their roots not in science but in philosophy.

Moreover, regardless of the nature of the interpretation, be it epistemological or metaphysical, the fact is that the only way *we* get some definite knowledge about the system is when the human observer knows the measurement – he has a definite outcome. And this unique role of the observer in quantum phenomena indicates the non-physical character of the observer. In short, it is important to note that Barr's analysis of the role of the observer in quantum phenomena emphasizes the *observe*r as one who *knows* the definite outcome. And this means that an apparatus cannot fulfill the role of the observer in quantum theory. By virtue of its being a purely physical entity, a measuring device belongs to the mathematical description of the system [meta-system] in terms of probabilities, which means that it will never know the definite outcome. Thus, the observer not only must be external to the physical system in the sense of being non-physical but, most importantly, it must have the capacity to know, which, by virtue of his intellect, is the human being. As we have seen, Barr's analysis of the role of the observer points to the non-physical nature of the human intellect. His analysis serves as an example of how contemporary science, specifically the orthodox interpretation of quantum theory in this case, supports Aquinas' view of the immaterial nature of the intellect.

5.2.2. Actuality and potentiality and quantum theory

[517] Some scientists [e.g., J. Polkinghorne] call this interpretation epistemic and not epistemological. I will use his term.
[518] Quoted in M. J. Dodds, *Unlocking Divine Action, op. cit.*, p. 64.

In this section I add to the debate by suggesting that Aristotle's concepts of potentiality and actuality can be used to support an epistemological interpretation of the role of the observer.[519] Heisenberg applies the concepts of potentiality and actuality to explain the role of the observer in quantum phenomena, but not everyone agrees with the way he uses it. The problem is that he bases his explanation on a metaphysical view of quantum theory.[520] Consequently, the observer actualizes the potentiality of the indeterminate character [non-definite being] of the quantum world and, in this sense, gives it actual being. Both the metaphysical and epistemological views of quantum theory acknowledge that our knowledge of quantum phenomena between measurements can be only probabilistic; however, their interpretations of the role of the observer are very different. In the epistemological view, as I have explained, the observer actualizes the potentiality of the world to be known by the observer – *the potentiality of the observer to know the definite outcome*. In contrast, in Heisenberg's (metaphysical) view the observer actualizes the potentiality of quantum reality to be definite – *the observer actualizes the indeterminate nature of reality*. In other words, the role of the observer in this case is not limited to actualizing only one of multiple hypothetical possibilities, but it seems to extend to creating concrete physical reality out of the undetermined flux.

Interestingly, Aristotle's concept of potentiality and actuality seems well suited to support the epistemological interpretation of quantum theory. In the metaphysical view, the lack of our ability to know exactly the behavior of the particles means that the quantum world is indeterminate. In this view, the lack of exact knowledge [ignorance] is identified with the way the world *is*, with the being of the world. By contrast, I suggest that, in an act of observation, the observer does *not a*ctualize the potentiality of the indeterminate world *to be*, which may lead one to the idea that one constructs the world. Rather, by actualizing a definite outcome, *the observer actualizes the potentiality of the world to be known and his own potentiality to know something definite about quantum phenomena, if only momentarily.* As such, this is an entirely epistemological interpretation.

Applying the concepts of potentiality and actuality to explain the act of understanding the world, we can say that the intellect has the potentiality to know and the world has the potentiality to be known. Moreover, to the extent that we do have some knowledge of the world, we can say with confidence that it can be known – the world is intelligible.

[519] See Chapters 2 and 3 for how Aristotle uses potentiality and actuality to explain the power of sensation because it provides an example of their application as fundamental explanatory principles.
[520] W. Heisenberg, *Physics and Philosophy…*, *op. cit.*, pp. 20-21.

Furthermore, as Aristotle says, the intellect has the potentiality to know all things [to become all things][521] and, as Aquinas explains – it knows by acting upon the world, that is, by abstracting intelligible species from the images obtained through sensation and perception.[522] And in forming concepts the intellect actualizes its own potentiality to know the world. That is, by acting upon the world, the intellect's own potentiality to know is realized in the world's potentiality to be known [to be understood].

The activity of the active factor [intellect] and that of the passive factor [the world] – that is, the intellect's knowing and the world being intelligible – is one and the same act that is realized in the world being known [understood]. However, the distinction between their being remains, and as potentialities one can exist without the other. That is, although as knowing and being known they are one act, the being of the intellect is distinct from the being of the world, and the potentiality of the intellect to know is separate from the potentiality of world's potentiality to be known,

However, insofar as the actuality of the intellect has to be realized by intelligibility of the world, this means that without acting upon the world, the intellect cannot actualize its potentiality to know and the world cannot actualize its potentiality to be understood. To actualize both potentialities the intellect must act and the world must be open to being understood.

But since, as potentialities, one can exist without the other, the act of the intellect may not always be realized in the world. The intellect's act of knowing may somehow be prevented from actualizing the world's potentiality to be fully known, which may be due to either the world or the intellect. That is, despite its potentiality to know, the intellect could fail to be actualized in its understanding the world. It could be that it fails to understand the world because the intellect is somehow imperfect. Even though, as Aristotle says, the intellect has the potentiality to know; nonetheless, the human intellect, in this present state of life, is dependent on images that come from sensation and perception [our physicality]. The requirement to rely on the sensitive power is the limiting factor to the intellect's power to know. But it also could be that the world's potentiality to be understood is somehow obscured; for example, its view may somehow be obstructed by being too distant or too small to perceive with the naked eye. In this case it is the being of the world that prevents the intellect from actualizing the world's potentiality to be fully known.

[521] Aristotle, *De Anima*, *op. cit.*, 429a 20-25.
[522] Aquinas, *Summa Theologiae, op. cit.*, Q85.

Where, then, lies the obstacle to the complete knowledge of the world? Is it in the world's potentiality to be known – the passive factor – or is it in the intellect's act of understanding that actualizes the world's being known? Is it the indeterminacy of the world? Or it is imperfection of the human intellect?

Since the world has the potentiality to be known [is intelligible] and, to some extent, it is known by us, and since in principle, the intellect has the potentiality to know all, this indicates that it is the intellect's act, as that which is supposed to actualize the world's potentiality to be known [to understand the world], that somehow fails to actualize its potentiality to have the complete knowledge of the world. This failure becomes quite obvious with regard to our knowledge [or rather our ignorance] of the quantum world. And this is why it is only in the act of observation – that is, when the intellect knows the definite outcome, that the potentiality of the world to be known [understood, grasped] is fully actualized, even if it is for a moment – that both the intellect's understanding and the world's being understood are actualized in the definite outcome. The act of observation in quantum phenomena, i.e., the collapse of the wavefunction, serves as an example where the actuality of the intellect [knowing] and the actuality of the quantum world [being known] are one and the same act.

The intellect makes the world of quantum phenomena known in the act of observation. The observer 'brings' the quantum world out from the realm of hypothetical probabilities into the actual, not by actualizing the world's potentiality to be but by actualizing the potentiality of the intellect to grasp the definite outcome, that is to know something definite about quantum phenomena – to unveil a bit of the world's mystery. In short, the intellect has the potentiality to know all, which includes the universe in its greatest and its most minute realms; however, given our individual limited intellects and thus our limited knowledge, the epistemological interpretation of quantum theory seems the most appropriate at this point.

5.3. Other contemporary arguments for the immateriality of the intellect

In the first section of this chapter I discussed Barr's argument for the immateriality of the intellect, which is based on the unique capacities of the intellect in contrast to physical bodies. One of the reasons that I chose his argument is because it follows Aristotle's method of inquiry, according to which the proper object reveals the character of the operation which, in turn, reveals the power of the operation. Aristotle' method is later expressed in Aquinas' principle that *action follows being*. The main point of Barr's argument is that the definite outcome of a measurement can only be obtained by an observer that is external to an isolated

system and does not belong to the physical system. And since obtaining the definite outcome involves an intellectual act of judging by the observer, this indicates that intellectual act of judging is immaterial.

The measurement problem is a proverbial "thorn in the side" of quantum theory. Despite many attempts to eliminate it, especially by those who espouse reductive physicalism, it continues to be discussed.[523] For example, Hans Halvorson argues for the non-physical character of mental states, albeit from a different perspective. Whereas Barr's approach is rooted in Aquinas' concept of the human person[524] which accommodates both hylomorphism and immaterial character of the intellectual operation, Halvorson is a dualist. Halvorson's argument is also based on the Copenhagen interpretation of quantum mechanics,[525] but he uses the idea of quantum superposition to argue for the non-physical character of mental states. His main point is that while superposition is a feature of the physical reality at all its levels, it is not a feature of mental states because mental states cannot be superimposed. In support of this claim, he points out the lack of evidence of superimposability and provides positive arguments against superimposability of mental states.[526]

Arguments for the immateriality of the mind are offered by many philosophers of mind, but I will present three of them here: by Edward Feser, Stanisław Judycki, and Jörgen Vijgen. Although all of them argue for the immaterial nature of the human intellectual soul, each of them uses a different approach. Feser uses an argument developed by James Ross and deals directly with the problem of immateriality of the intellect. Judycki's approach underlines difference between properties of matter and intellect. Vijgen's argument is nestled within Thomistic hylomorphism.

5.3.1. Feser

In contrast to most contemporary analytic philosophers of mind whose arguments for the immateriality of the mind focus on the problems of consciousness and intentionality,

[523] The measurement problem has been discussed by philosophers representing different views of the mind, for example Hans Halvorson, David Chalmers, and Robert Koons.
[524] For Aquinas a human person is the unity of body and intellectual soul, however, the operation of the intellectual power of the soul is immaterial. He accommodates two principles in one being without separating them or reducing one to another.
[525] The Copenhagen Interpretation of quantum mechanics is widely accepted by most physicists.
[526] For the details of his argument see H. Halvorson, *The Measure of All Things, Quantum Mechanics and the Soul*, *op. cit*.

Edward Feser[527] argues that it is rationality that is the key to the immateriality of the mind. In his recent argument for the immateriality of the mind[528] he explains why consciousness and intentionality are inadequate to support the immateriality of the intellect and expands on the argument of James F. Ross.[529]

Philosophers of mind are generally divided into two main camps: dualists and physicalists. While dualists assert the existence of mental and physical realms, physicalists want to reduce all states [mental and physical] to physical states. However, as Feser point out, three aspects of the mind that evade materialist interpretation are rationality, consciousness, and intentionality. *Consciousness* is awareness of the external and internal happenings. It belongs to human and to non-human animals but not to plants.[530] *Intentionality* is directedness towards objects – it is about something. Not only is present in humans but also it seems to be present in animals [e.g., cat is directed towards a mouse] and even in plants [turning towards the sun]. *Rationality* is the capacity to form abstract concepts, to put them in thoughts and propositions, and to reason logically from one proposition to another. It is unique to human beings. Thus, if consciousness and intentionality include other forms of life, rationality is unique to humans.[531]

Contemporary philosophers of mind believe that rationality is much easier to explain than consciousness and intentionality. They are so impressed with the computer analogy that they think of a brain as computer hardware and of mental phenomena as a computer software. Since in this view rationality is a computer software, it is easily explained.[532]

The reason most philosophers believe that consciousness and intentionality are harder to explain than rationality has to do with many quite popular arguments that claim that consciousness and intentionality are not reducible to matter. One of the best known is the so-called "knowledge argument" [Frank Jackson], according to which you can possess all the theoretical knowledge about colors, but still you will not be able to recognize a color you do not know. The very popular "zombie argument" [David Chalmers] speaks of creatures that are particle by particle like human beings but have no consciousness. His point is that: "facts

[527] Edward Feser is a well known American philosopher and writer on philosophy of mind, Aristotle, and Aquinas.
[528] E. Feser, *Arguments for the Immateriality of the Mind,* a talk offered at the annual Conference of the Society of Catholic Scientist at CUI, 2018.
[529] J. F. Ross [1931-2010], an American philosopher.
[530] This understanding of consciousness to some extent reflects Aristotle's notion of both sensitive and intellective soul; however it does not distinguish between sensation and intellection.
[531] E. Feser, *Arguments for the Immateriality of the Mind, op. cit*.
[532] *Ibid.*

about qualia and consciousness are facts over and against the physical facts."[533] The "swamp man experiment" [Donald Davidson] is about a creature that is particle by particle a duplicate of human being but has no intentionality indicating that: "facts about intentionality are facts over and against the physical facts."[534]

Feser points out that even though these arguments are effective against materialism, they are not relevant to establishing the immateriality of the intellect.[535] The reason they work against materialism has nothing to do with conception of the mind but is because they are ultimately rooted in the modern scientific notion of matter, specifically, mathematization of matter and the division between primary and secondary qualities. In modern conceptions, matter has only quantifiable properties such as extension and spatial location which are its primary properties. The primary properties [quantitative] belong to matter, but secondary properties [qualitative characteristics] such as color, odor, flavors, and sounds exist only in the mind. Irreducibly qualitative features are taken as qualia that exist only in consciousness. They are part of the perception of the external world but not of the external world itself. Feser argues that once you accept this kind of division of matter, you commit yourself to dualism. How? If qualities [at least the way they are experienced in daily life] do not exist in matter, this entails they do not exist in the brain [since brain is material]. But if you also say these qualities do exist only in the mind, i.e., in our conscious experience of matter, then you say the mind is immaterial. In short, Cartesian dualism is rooted in the modern conception of matter.[536]

Intentionality suffers a similar fate. In the highly mathematized conception, matter is devoid of final cause, that is, it is devoid of any teleology and thus directionality. But since intentionality is a species of directionality, matter is also devoid of any intentionality. But intentionality does exist in the mind insofar as our thoughts are directed or about something. Thus, in a highly mathematized view of matter which is devoid of any directionality, intentionality becomes an aspect of only the mind. But if directionality is in only the mind, then qualia and intentionality are purely mental phenomena. This implies matter-mind dualism.[537] In short, Feser's point is that to the extent that arguments from qualia and

[533] *Ibid.*
[534] *Ibid*.
[535] *Ibid*.
[536] *Ibid*.
[537] *Ibid*.

intentionality are not based on any intrinsic characteristics, but stem from materialist conceptions of matter, they are insufficient as arguments for the immateriality of the mind.[538]

Rather, argues Feser, it is rationality [its intrinsic characteristics[539]] that is the key to the immateriality of the intellect. To make this point, he uses the argument proposed by James F. Ross,[540] which takes the form of the following syllogism.

1. Formal thought processes can have exact or unambiguous conceptual content.
2. Nothing material can have exact or unambiguous content.
3. Formal processes are not material.

If we accept premises 1 and 2, the syllogism is valid. And starting with premise 2, Feser explains why we should accept Ross' premises.

The basic idea of premise 2 is that physical representations such as pictures or words can have multiple conceptual contents. A drawing of an isosceles triangle can have different contents. It can refer to "a triangle, a pyramid, a slice of pizza or triangularity in abstract."[541] Moreover, nothing in the physical properties of the drawing [e.g., the thickness of the line or the chemistry of the ink] tells us what it represents, i.e., what its conceptual content is. Neither does the word itself that refers to drawing provide any further clue because what word we use is a matter of convention. Nothing physical in the image conveys its conceptual content. A given image can represent many different conceptual contents. In short, *physical properties are ambiguous as to their conceptual content*.

Feser offers another example. Let's say you are performing some calculation which could be called addition or quadition.[542] He points out that nothing in your behavior or your neurological system can determine which calculation you perform. Neither does it matter what word you use to describe your action; rather *what matters is the meaning you attach to actions and words*. Furthermore, to be able to make a correlation between your action and the neural activity, it must be decided first what action is being performed. As Ross puts it:

> "There is nothing is the material facts about human nature, [physiology, behavior, neurophysiology] that can suffice to determine the meaning or conceptual content of any sentence or any other material representation."[543]

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[538] *Ibid*.
[539] My addition in parentheses.
[540] J. Ross [1992, *The Journal of Philosophy*] as used by E. Feser's, *Arguments for the Immateriality of the Mind, op. cit*.
[541] E. Feser, *Arguments for the Immateriality of the Mind, op. cit*.
[542] *Ibid*. Feser uses an example from Kripke to illustrate his own point.
[543] *Ibid*.

In other words, the physical properties of any material representation are by themselves ambiguous with respect to their conceptual content. And "whatever the conceptual content of it is, has to be decided by something outside [external to it] these properties."[544]

Materialists may use the observation that words and pictorial representation are always ambiguous to argue that deciding on the meaning of a representation is a purely pragmatic choice. But as Feser, points out, this position flows from their claim that only physical facts exist. Since purely physical facts [e.g., neural events] cannot determine whether the representation has this meaning and not the other, materialists, following their belief that "physical facts are all the fact that are",[545] conclude that there is no fact of the matter [no objective fact] – that the representation has one meaning and not another – and claim it is utility that determines the meaning of the representation.

Ross's argument challenges this claim. Whereas physical facts do not have determinate content, Ross argues that all our thoughts, but especially the formal thought processes, have some determinate, unambiguous content. His argument focuses on mathematics [e.g., adding, subtracting, squaring a number] and logic [e.g., reasoning through syllogism, inference modus potens, modus tolens] because they offer the clearest examples of formal thinking. And whereas materialists claim there is no objective fact of the matter about an action [or pictorial representation] and so its meaning is a matter of utility, Ross offers several reasons why this cannot be right, namely, 1] evidence from our consciousness, 2] evidence from the vast body of knowledge, 3] evidence from our application of logic , and 4] denial of the rules of logic.

First, if phenomenology is wrong, i.e., "if we cannot trust our judgments about the conceptual content of our thoughts neither can we trust the conceptual content about our perceptual evidence."[546] Moreover, if we cannot trust our conscious experience and thus our judgments about the conceptual content of our thoughts, then how can we trust our perceptual experience? That is, if we do not trust our consciousness, we also undermine all conceptual content about perceptual evidence, and if we undermine all conceptual and perceptual content, we undermine the evidence on which our experimental science rests.

Second, our vast body of knowledge shows that there are facts of the matter. Because, if there are no objective facts of the matter then how do we explain the vast the body of knowledge that comprise mathematics and formal logic and thus science? Moreover, how can

[544] *Ibid*.
[545] *Ibid*. Feser gives examples of Kripke's and Dennet's views.
[546] *Ibid*.

we explain that math and logic are disciplines in their own right? In short, if we deny that our formal thinking is determinate or unambiguous, we undermine the possibility of knowledge.

Third, if there are no objective rules of inference [no objective fact of the matter] then how can we trust that logical arguments have any validity? Again we undermine any possibility of objective knowledge. By the same token, since for Dennet or Quine there are no objective facts of the matter[547], their arguments have no validity. We can see how this view is self-defeating. Because if you don't apply rules of interference [objective rules], you cannot know if any argument has any validity.

Fourth, Feser points out that even more self-defeating is the denial that we use modus ponens because in our denial of it we confirm its existence. That is, to deny that we use rules of logical interference is to deny the truth of logical interference. But to deny that we do any of these things [subtract, divide, do logic] implies that at least we presuppose that we know how to do these things. The fact that we claim that there is logical truth shows that that there is at least one thought that is unambiguous, determinate. And insofar as it is so, this indicates the immateriality of the formal processes.

In sum, Feser makes two main points in his arguments. First, he points out that arguments from consciousness [qualia] and intentionality are effective against materialism, but they do not aid in explaining immateriality of the mind. Qualia and intentionality are aspects only of the mind, but they have become so because modern scientific notions of matter managed to remove all qualities and directionality from matter. They entail mind-body dualism but there is nothing intrinsic in them that would point to their immaterial character and thus they do not provide any answers to the question of the immateriality of the mind.

Second, he explains that Ross' argument deals directly with the question of the immateriality of the mind. His main point is that physical representations are ambiguous with respect to their conceptual content, that is, they can have multiple conceptual contents. Moreover, nothing in the physical properties of representations reveals its conceptual content. By contrast, formal thought processes [e.g., logic, mathematics] can have exact, unambiguous conceptual content. This indicates that formal thought processes are immaterial.

5.3.2. Judycki

[547] As cited in *Ibid.*

Stanisław Judycki's arguments[548] are based on differences between the essential characteristics of matter and mind, the most important being the intellect's intrinsic capacity for meaning which matter does not have. Materialists use the correlation between certain mental states with brain states to claim that the complicated arrangement and organization of the neural connections of the brain can fully explain the mind and mental states. Judycki argues that the complexity of matter [its complicated arrangement] does not prove its capacity to think and understand meaning.

First, *complexity is not an intrinsic and objective feature of matter* the way momentum or mass is. To some extent, it is an observer' perspective that determines how complicated an entity is, that is, it is difficult to define complexity in an objective manner. For example, from a microscopic perspective [i.e., at the subatomic level of electrons, quarks, etc.] a skein of yarn is just as complicated as the brain and nervous system.

Furthermore, increasing the complexity of a material entity [e.g., through evolution] will not lead to qualitative complexity. Regardless of the level of the complexity and arrangement of a material entity, be it skein of yarn or an electronic device or a brain, *material complexity can never be a semantic complexity*. The reason is that, in contrast to a physical network, a semantic network has elements that are undefined and open to interpretation, in fact, this is what characterizes semantic networks. In other words, the real difference between the complexity of matter and that of the mind is the mind's capacity for thinking, understanding, for understanding meaning and making meaningful connections between concepts. By contrast, regardless of how complicated a material entity can be, it is not able to think and understand meaning.[549]

Judycki's second argument is directed against the computational model of the mind. According to this model, the mind is a computer [syntactic machine] whose function is realized in a neuronal substrate [brain and neurons]. Judycki, like Searle[550], points out that words like "computation", "algorithm", or "program" do not refer to intrinsic and essential properties of physical systems. They are not discovered empirically; rather, it is the human mind that designates these computational states to given physical structures.

Although Judycki agrees with Searle that a computer cannot be a model for a human mind, he argues against his naturalism, specifically, Searle's claim that it is the highly

[548] S. Judycki, *Dwa argumenty przeciwko materializmowi, op. cit.*
[549] *Ibid.*
[550] John Searle [The Rediscovery of the Mind, 1992]; Polish translation by T. Baszniak, 1999, as used by *ibid.*

complicated biological structure that must be responsible for conscious mind.[551]Just as complexity of matter [e.g., complicated biological structure] is not sufficient to explain the complexity of the mind, neither is syntax, because neither of them is an intrinsic feature of matter. If complexity of matter is, to some extent, dependent on perspective, syntax [a computer program] is dependent on the mind of the programmer.

Even if we were to agree that an increase in neuronal complexity results in the mind [biological causality], this would require a certain purposive organization of matter, that is, organization that would make matter have the capacity to think.[552] But as Judycki points out, "złożoność", that is, a complexity organized with a given purpose or end, is a semantic characteristic, that is, it regards meaning, a characteristic which does not belong to matter. In short, neither syntax nor purposively organized complexity can explain the mind because they are not intrinsic or essential characteristics of matter – their organization and thus meaning is dependent on the something that is external to them. The syntax of a computer program and thus its meaning depends on a programmer. The complexity of matter lacks semantics.

Judycki also argues against reductionism, specifically so called "theory reductionism", because it implies ontological reductionism.[553] In theory reductionism, a scientific theory is either better explained and replaced by another theory [soft reductionism], or it is eliminated [hard reductionism]. With regard to the mind, soft reductionism tends to augment the previous understanding through new observations and theories. By contrast, the goal of hard reductionism is to explain the mind entirely in terms of brain and neuronal processes so that even the notion of mental states is considered meaningless. Judycki points out that any reduction is at best a correlation and to claim otherwise would require a phenomenal experience of a given causal event. For example, although science discovered that colorless liquid is correlated with H_2O, it will never discover that water is identical to H_2O because this would require a direct phenomenal conscious experience [observation] that would show how a certain physical structure [e.g., H_2O] causes our conscious experience of water. Since objective observation of such experiences is impossible, Judycki argues that, despite their correlation, the reduction of one entity to another is impossible. Since we cannot even claim that water, of which we have direct experience, is identical with the physical structure H_2O, it

[551] S. Judycki, *Dwa argumenty przeciwko materializmowi, op. cit*.
[552] Judycki makes a distinction between the words "skomplikowany [complicated]" and "złożony", complexity that has purpose, is organized. "złożoność" complexity of the mind organized with a given purpose or end, is a semantic characteristic, that is, it regards meaning, a characteristic which does not belong to matter.
[553] Ontological reductionism asserts that reality is composed of a minimum number of kinds or substances.

makes even less sense to claim that mental phenomena that are presented to us in our internal/subjective experience are identical with the physical phenomena in the brain. We have no direct observation that this is the case.

Furthermore, neither will appeals to supervenience[554] or emergentism[555] help reductionism. Even if supervenience were observed empirically as correlation [and it is not], this would require two kinds of supervenience: 1] mental phenomena are supervenient on physical; and 2] mental phenomena are supervenient on the power that connects the physical and mental realms, and this power creates the illusion of mental causation. And obviously, this power could not be supervenient on physical phenomena because that would not make sense. As for emergentism, what it shows is either our lack of knowledge of how one thing is correlated with another, or as Judycki puts it, it is pure magic because, although we have no clue, the word 'emergentism' suggests that we know how one thing was produced by another. However, correlation does not imply generation – just because two things are correlated with each other does not mean that one is produced by another.

In sum, Judycki makes several main points. First, the increased level of complexity of matter does not explain the mind because determining how complex a thing is not an intrinsic and objective feature of matter. Moreover, increasing complexity of matter will not result in semantic complexity which involves openness to interpretation. Second, a computational model of mind will not help solve the problem of mind because, just like complexity of matter, syntax [computer program] lacks intrinsic meaning but is instead given meaning by a programmer. Judycki also argues that reductionism, supervenience, or emergentism cannot explain the mind. Regarding reductionism, we cannot have direct phenomenal experience of reduction of mental states to brain states. Supervenience would not only require several levels of supervenience, but it could never explain the power that makes supervenience possible in the first place. And emergentism smacks of magic because it claims that it knows how one thing emerges from another but in fact it does not; moreover, correlation does not imply generation.

5.3.3. Vijgen

[554] Supervenience refers to a relation between two different classes or properties. In philosophy of mind it denotes a relation between physical and mental states or properties. The main idea is that there can be no change in higher sets of properties without change in lower sets of properties.

[555] Emergentism in philosophy of mind is a belief that mind, although ultimately developed from brain structures, has new properties that are not reducible to those properties from which it developed.

Jörgen Vijgen's argument for the immateriality of the human soul is ultimately linked to the question of "what makes us a human – the soul or the brain?"[556] However, he points out that when formulated this way the question already presupposes mind-body dualism and material reductionism. Vijgen argues that from a Thomistic perspective, the soul-brain distinction creates a false dichotomy between the mind [i.e., intellectual human soul] and the body [brain] that is entirely counter to Thomistic understanding of the human being as the unity of the body and soul. From a Thomistic perspective, the soul is not a neuroscientific concept – it is not the brain and nervous system, that is, it is not a purely physical entity which can be understood in modern scientific terms – rather, the soul is a metaphysical and anthropological reality. Thus, Vijgen argues, the question of what makes us human, can be answered without reference to neuroscience; rather, it is Thomistic hylomorphism[557] that offers a viable solution to the problems created by the false mind-brain dichotomy.

Vijgen divides his argument into three main parts. First, he argues that Thomistic hylomorphism is superior to modern views of a material body because it accommodates the causal efficacy of the body, for example in perception, image formation, virtue and vice formation, proper functioning of the intellect. Vijgen states that:

> "For Thomas the body and the brain (taken as totum pro parte) act as a material, dispositive and instrumental cause, i.e., the body and the brain offer as an instrumental agent cause the material and the disposition for the production of the ultimate effect by another agent cause, the intellect."[558]

Second, Vijgen stresses the soul's intrinsic connection with the body:

> "Although the soul is not identical with the body, the soul belongs to the nature of a bodily substance. It does so because *the soul is the principle of the unity of the body and as such the soul constitutes the body* [my italics]. In other words, the soul does not have a species of its own, otherwise it would be an angel (ST I, 90, 4, ad 2); it is not a complete, fully distinct entity but part of a complete entity, a human being."[559]

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[556] J. Vijgen, *Soul or Brain: A False Dilemma? The Thomist Perspective*, "Scientia et Fides", 2017.
[557] Hylomorphism – all substances are a composites of matter and form. With regard to human beings it is a unity of body and soul.
[558] J. Vijgen, *Soul or Brain…, op. cit*., p. 76.
[559] *Ibid.*, p. 77.

Third, following Aquinas, Vijgen argues for the soul's subsistence by virtue of the immaterial nature of its intellectual operation. He presents three arguments for the soul's immateriality from the uniqueness of intellectual knowledge. All of them are based on Aquinas' arguments for the immateriality of the intellect [see Ch. 4 of this work].

The *first* argument is based on the difference between the capacities of the physical body and the intellect. Vijgen somewhat rephrases Aquinas' argument in terms of the difference between absolute and particular objects. Nonetheless, the idea behind these arguments is essentially the same, namely, it regards proportionality between the proper object and its respective organ. This echoes Aristotle's observation that each organ has its proper object as well as his method of inquiry, in which the object reveals the activity which, in turn, reveals the power that makes that activity possible [see Ch. 3 of this dissertation]. Vijgen writes:

> "Every material organ grasps a particular whereas the intellect grasps the abstract or universal. The abstract or the universal are therefore not grasped by a material organ. The intellect's activity, therefore, although made possible by bodily organs, does not consist in the activity of a bodily material organ"[560]

In short, if the intellect is material, then there is a problem of how that which is not individual could be grasped by something that is individual/material. Thus, "Only an intellect that is not material itself can grasp something non-material such as a universal."[561]

Furthermore, Vijgen points out that a reductionist account makes impossible the correspondence [adequatio] between the intellect and reality. Whereas in the Thomistic account, the intellect has the capacity to form universal concepts, in a reductionist account the intellect has contact only with particulars [brain states]. The intellect that is 'locked within' brain states does not have the capacity to judge whether these brain states correspond to reality. That is, to be able to judge particulars [i.e., brain states], the intellect must have the capacity to go transcend them.

The *second* argument is from self-reflection and self-experience. Following Aquinas, Vijgen argues that a physical body is not capable of a self-reflection. His argument can be summarized as follows. If acts of self-reflection and self-experience exist, and if there is a conscious and indivisible subject which has them, then, it is not possible for a material and

[560] *Ibid.,* p. 79.
[561] *Ibid.,* p. 80.

composite entity to have these acts. Basically, self-reflection and self-experience can be acts only of conscious and indivisible subjects because only such subjects have the capacity to produce these inner acts. Moreover, self-reflection is a subjective experience, and it cannot be grasped by objective means, e.g., by monitoring brain waves.

The *third* argument is based on the experience of free acts. The idea is that if all experiences are fully determined by material processes [brain states], then experience and existence of free acts is impossible. In Vijgen's words: "By definition a free act does not proceed from any other cause than the human person and as such free acts cannot exist in a materialistic account."[562]

Vijgen's arguments for the subsistence of the human soul are basically Aquinas' arguments for the immaterial nature of the intellect, and since the intellectual form is the substantial soul of the human being, they are arguments for the immaterial nature of the human soul. The human soul is the subsistent principle – "it executes its operation of knowing and willing by itself."[563] In short, the unique qualities of the intellect point to its immateriality, and since the intellectual form is the soul of the human being, its immateriality points to the soul's subsistence.

Nonetheless, the subsistence of the soul can be misunderstood when the soul is viewed as a separate entity from the body – substance dualism.[564] But as Vijgen points out [and I discuss in Ch. 4], this is far from what Aquinas means.[565] As Aquinas explains, the particular thing, in this case the soul, can be understood in two senses. First, it can be understood as anything subsistent and this "excludes the inherence of an accident or of a material form."[566] In the second sense, the particular thing can stand for that which subsists and is complete in a specific nature and it excludes imperfection of the part. Since the soul is a part of human nature, it can be subsistent in the first sense but not in the second. That is, it is a human being that is complete substance. Even though the human soul as a part of human nature is not a complete substance, it is subsistent nonetheless by virtue of not being a material or accidental form.

In summary, Vijgen's arguments are directed primarily at the supposed soul-brain distinction, which is false from the Thomistic perspective because the notion of soul is not a neurophysiological concept but a metaphysical and anthropological reality. He argues that

[562] *Ibid.*
[563] *Ibid.*, p. 82.
[564] At this point I am providing Aquinas' explanation, not from Vijgen's text, because I find it much clearer.
[565] Aquinas, *Summa Theologiae, op. cit.*, Q75, Art. 2, Reply to Objection 1.
[566] *Ibid*.

Thomistic hylomorphism avoids the pitfalls of physicalism and dualism. The body and brain [the physical aspect of human being] have causal efficacy in perception, image formation, and proper functioning of the intellect. The soul is the principle of the unity of body and soul. Although the soul is not identical with the body, it constitutes the body, that is, it is not complete substance on its own. Nonetheless the soul is subsistent. Vijgen echoes Aquinas' arguments for the soul's subsistence, which are essentially arguments for the immateriality of the intellectual operation since it is that which demonstrates the soul's subsistence.

5.4. Concluding thoughts

In Chapter 4, I discussed Aristotle's and Aquinas' arguments for the immateriality of the intellect, and in this chapter I presented several contemporary arguments for the immateriality of the soul. As we can see, they are based on Aquinas' arguments in the sense that they use similar observations about the fundamental differences between the mind [intellect] and matter. For Barr, it is the unique capacity of the intellect to judge, that is, to know the definite outcome of the quantum measurement that no physical entity is capable of doing. For example, a physical detector can read the measurement, but it is only the intellect that knows it. Feser, following Ross, argues that it is the capacity of the intellect to have unambiguous conceptual content as exemplified by formal statements in logic and mathematics. By contrast, physical representations have ambiguous conceptual content because there is nothing in physical characteristics of a given representation that defines it and thus makes it amenable to different interpretations. Feser's argument is similar to Judycki's and to Barr's in the sense that all of them point out that understanding and meaning are not intrinsic characteristics of matter. It is the unique capacity of the intellect to discover meaning, to understand, to formulate true statements. Finally, insofar as Vijgen argues for the subsistence of the human soul, he argues for the immateriality of the intellect. Following Aquinas, he underlines unique features of the intellect, namely its capacity to form universal concepts and its capacity for self-refection.

In the next and final chapter of this work, I want to stress Aristotle's and Aquinas' contributions to understanding of human being, but especially of human's unique capacity of intellection. I will draw several distinctions to highlight their methods and observations. However, I will start by briefly going back to the problem of naturalism and scientism. I will present Feser's arguments against scientism, and briefly discuss Heller's article on Christian Naturalism, in which he offers a radical alternative to atheistic naturalism.

CHAPTER 6
THE NATURE OF THE INTELLECT

Thus far, I have presented arguments for the immaterial nature of the intellect dating from ancient, medieval, and contemporary times. Nonetheless, the question of the nature of the intellect continues to be a highly contentious topic in scientific and philosophical debates. If we understand the nature of the intellect, we will shed light on understanding the being of the human being. If intellectual activity is a purely physical activity, then a human being is just a physical entity, a living physical entity but an entity that can be defined entirely by physical sciences, nevertheless. However, if human intellect is immaterial, then his being can never be confined to the physical realm. Our understanding of the being of human being has enormous moral consequences. It affects how we view ourselves, how we behave, how we treat others, how we treat non-human creatures, how we treat our environment, and ultimately, our approach to our destiny.

Despite the fact that we have gained a tremendous amount of empirical and theoretical knowledge about the universe, the question about the nature of the intellect remains fundamentally unchanged: is the intellect reducible to matter or is it immaterial? However, it has ceased to be exclusively a philosophical question. The development of modern science and its tremendous theoretical and technological successes has catapulted the question of the nature of human being into the realm of physical science, not only with regard to his biological being [physiological, sensory cognition] but also his intellect. And if Aristotle and Aquinas[567] clearly distinguish between the biological aspect of the human being and his intellect, this distinction has been steadily dissolving in contemporary debates on the human mind.

As discussed in Chapter 1, the current mainstream approaches to reality are predominantly those of naturalism, scientific materialism [physicalism], and scientism. Proponents of these approaches commonly employ several strategies to argue their position.

The first and most obvious strategy is to deny the existence of any reality beyond physical. They argue that since such reality cannot be proved by the methodology of empirical sciences, it does not exist – end of story.

[567] There has always been a debate between philosophers about the nature of the intellect. On the one hand, it is true that most philosophers of the past 2500 years considered human intellect as not reducible to matter. On the other hand, there have always been materialist approaches to the intellect as exemplified by ancient materialist philosophers as well as numerous modern and contemporary philosophers and scientists.

The second strategy, closely related to the first, is to ridicule anyone who believes or argues that immaterial intellectual substances may and do exist, and to belittle him as someone who is either backwards or not capable of scientific thinking. Frankly, this attitude is absurd. Clearly, there have been, and continue to be, many renowned philosophers and scientists who present valid logical arguments for the existence of reality that transcends the physical realm. Furthermore, a number of contemporary scientists and philosophers, who have been unable to account for certain phenomena in the physical universe, now seem more open to explanations that transcend the methodology of modern science.[568]

The third strategy that has been employed to argue against immaterial substances seems to be the most legitimate in the sense that is the most true to the methodology of modern science. The goal is to demonstrate or argue that matter *per se* can think and understand, that is, that thinking and understanding is a characteristic or a property of matter itself. The main attempt in this direction come from the field of computer technology, i.e., artificial intelligence [AI]. So far, these attempts have failed. Nevertheless, many argue that it is just a question of time and technological development before matter will be shown to be intelligent. If this happens to be the case, I will concede. However, even if computers become highly sophisticated, I have my doubts whether their 'intelligence' will be of the same kind as that of the human intellect.

As I state in the introduction, the main goal of this work is to argue for the immaterial nature of the intellect through the arguments of Aristotle and especially Aquinas. Given that science has not proved that matter or a purely physical body have the same capacity to understand as do human beings, Aquinas's arguments for the immaterial nature of the intellectual substance continue to present a challenge to materialistic and physicalist interpretations of the human intellect. I suggest that, in contrast to the scientific method, Aristotle's and Aquinas' method of inquiry is more suitable to the study of the human being in his entirety, i.e., in physical and intellectual aspects of his being.

In Chapter 1, I presented some of the mainstream contemporary philosophical positions such as naturalism, materialism, physicalism, and scientism. I also briefly explained how the notion of causality has changed since the times of Aristotle and medieval philosophy. Although it survived Hume's attempts to eliminate it, it has been confined to the principle of the causal closure of the physical. This constricted view of causality has influenced all areas

[568] There seems to be more openness to Aristotle's formal and final causality offering a possible explanation that goes beyond the methodological limitations of modern science. M. J. Dodds, *Unlocking Divine Action*, *op. cit.*, p. 60; E. Feser, *Aristotle' Revenge*, *op. cit*.

of inquiry including the interpretation of the being of human being. For most of Western history it was the mind, specifically the immaterial intellect, that defined human being as a rational animal, however, the contemporary notion of causality has undermined this view of the intellect. To the extent that the principle of causal closure of the physical defines contemporary view of causality, physical effects must have physical causes. Consequently, the existence of any immaterial causes of human actions is highly suspect if not outright eliminated. In sum, all human acts including thinking, understanding, as well as all forms of theoretical and practical moral reasoning, are expected to have exclusively physical causes such as brain activity. It appears that narrowing of the notion of causality has led to the narrowing of thinking.

In Chapters 2-4, I followed the development of Aristotle's and Aquinas' arguments for the immaterial nature of the intellect. In Chapter 5, I discussed Barr's analysis of the role of the observer in quantum phenomena. It serves as an example of a contemporary argument for the non-physical nature of the intellect. Using Aristotle's notion of potentiality and actuality, I then proposed an epistemological interpretation of quantum phenomena. I ended Chapter 5 with several contemporary arguments for the immateriality of the intellect.

I will begin the last chapter [Ch. 6] by briefly returning to the problem of naturalism and scientism. In chapter 1, I presented the currently predominant philosophical views regarding the being of human beings. In this chapter, I will discuss arguments that, in a way, offer replies to those views, namely Feser's arguments against scientism and two of Michal Heller's[569] ideas, specifically, his concept of Christian Naturalism (which I consider a response to physicalist versions of naturalism) and his explanation of the proper domain of the scientific method.

In the remainder of the chapter, I will return to Aristotle's and Aquinas' arguments for the immateriality of the intellect and present my position based on my reading of their arguments. I suggest that if the modern scientific method is appropriate to study the physical universe, Aristotle's method is better suited to study a human being in his entirety. Modern science, by virtue of its methodology [empirical and quantitative], is confined to physical causes and quantitative calculations that lead to the contraction of the field of inquiry and ultimately to reductionism, even if this reductionism may hide under the guise of immaterial mathematical reality. In other words, the methodology of modern science a priori restricts the field of inquiry to the physical realm. This approach tends to be embraced by physicalist and

[569] Michał Heller is a Polish mathematical physicist and philosopher, professor at the Faculty of Philosophy at the Pontifical University of John Paul II, Kraków, Poland.

scientific materialists which implies that, instead of being open to the question of the nature of the intellect, they search only for answers that will prove their scientific paradigm. By contrast, Aristotle's method of inquiry is *open* to all reality. With regard to human being, it can explain his different capacities and acts and account for the essential differences between sensation, sensitive cognition, and intellective cognition without explaining one in terms of another or reducing one to another. Of course scientific advances have greatly improved our understanding of many of the physical processes, but I suggest that instead of dismissing Aristotle's method of inquiry as outmoded, we should benefit from it as it helps reveal the innermost principles of reality.

I present several distinctions I consider crucial to Aquinas' arguments for the immaterial character of the intellect.[570] The distinction between the sensitive and intellective powers is crucial to understanding the difference between the biological and intellective aspects of the human being, and the distinction between the soul's essence and its powers uncovers the possibility of the unity of the immaterial intellect and the human body – the latter distinction is vital to the Thomistic notion of hylomorphism.

The distinctions, I suggest, build upon one another. The distinction between potentiality and actuality explains change in all its forms. Aristotle's open method of inquiry enables discovery of the essential differences between the nutritive, sensitive, and intellective powers of the soul, or to put in modern terminology, the key distinctions between physiological functions, sensory cognition, and rational cognition. The distinction between the essence of the soul and the operations of the soul's different powers [i.e., sensory cognition vs rational knowing] makes it possible to explain the dependence of physiological functions and sensory knowing on the body and subsistence of the intellectual operation.

I will end the chapter by emphasizing the need to reclaim the wisdom of Aristotle and Aquinas with regard to understanding the being of human being.

6.1. Some responses to scientism and naturalism

[570] Although the selection and analysis of these distinctions is entirely mine, they have been discussed in different ways in the literature, for example in recent years in S. Świeżawski's translation and comments on Aquinas's *Treatise on Man* [*Święty Tomasz z Akwinu: Traktat o Człowieku – Summa Teologii 1,* Kęty, 2000, p. 75-89], E. Feser's *Scholastic Metaphysics* [*op. cit.*] and *Aristotle's Revenge* [*op.cit.*], A. J. Freddoso's article *No Room at the Inn: Contemporary Philosophy of Mind meets Thomistic Philosophical Anthropology* ["Acta Philosophica", 2015], and numerous other commentaries on Aquinas. In this work I clarify and emphasize the metaphysical significance of these distinction, specifically with regard to the nature of the intellectual operations of understanding.

Although the debate on the nature of the intellect continues, the predominant current method of inquiry favors that of the physical sciences. Effectively, the mind tends to be interpreted in terms of the material reality. The distinction between the biological [physiological] and intellective aspects of human knowing, so strongly emphasized by Aristotle and Aquinas, has been erased. At the crude level, the mind is understood in terms of matter [i.e., mind is equated with brain]. On a more subtle level, and insofar as matter is interpreted and expressed in terms of mathematics, the hope is to capture the nature of the mind in terms of mathematical concepts and equations. Thus, insofar as physical sciences set the tone, naturalism, materialism, physicalism, and scientism dominate inquiry about reality in general and the intellect.[571] It is fair to say that the present-day motto is: since nothing immaterial can be proven empirically, it does not exist.

Although this view presently dominates most academic disciplines, including philosophy of mind, it is far from being accepted by all philosophers and scientists.[572] Below, I examine the thoughts of E. Feser and M. Heller as examples.

6.1.1. Feser and scientism

In *Scholastic Metaphysics*, Feser points out four main problems with scientism.[573] *First*, it is self-defeating. Second, the scientific method cannot in principle provide a complete description of reality. Third, neither can it provide a complete explanation of reality. Fourth, scientism's argument from the successes of modern science has no force. As Feser rightly points out, the main claim of scientism, namely, that: "the methods of science are the only reliable ways to secure knowledge of anything (Rosenberg 2011, p. 6),"[574] is ironically self-defeating. It is neither a scientific claim, nor can it be substantiated using the scientific method – this statement cannot prove what it sets out to prove.[575] But why not?

Scientific inquiry rests on certain philosophical assumptions such as the existence of the external world, that this world is governed by certain regularities which are captured in scientific laws, that these regularities can be discovered and described by the human mind,

[571] E. Feser, *Scholastic Metaphysics, op. cit.*, loc. 169.
[572] As I have shown throughout my work, there are many philosophers and scientists [e.g., Barr, Feser, Madden, Freddoso, Dodds] who argue that Aristotle's and Aquinas principles of philosophy of nature and metaphysics are needed to be able to understand all reality.
[573] E. Feser, *Scholastic Metaphysics, op. cit.*, loc. 169.
[574] *Ibid.*, loc. 175., loc. 169.
[575] *Ibid.*, loc. 175.

and so forth.[576] The scientific method *presupposes* these things, but it *cannot justify them* because this would require 'getting outside of science'. But to prove that science has an accurate picture of reality from 'outside of science' would defy the claim of scientism that only science can provide a secure knowledge of reality.

Furthermore, even the statement that science is a rational inquiry cannot be established scientifically.[577] Science and its method *presuppose rational concepts*, i.e., without them there would be no science. Science is a rational inquiry but how can science prove using its method that it is, in fact, a rational inquiry? It would have to establish it by its own principles [quantitative and empirical] that it is rational. Again, this is impossible because this can be only established by something that is external to it.[578]

I would add that to prove that the methods of science are the only reliable source of knowledge, the scientific method would have to disprove all other claims, or to prove that all other methods are wrong. However, science will never be able to prove the existence of non-material reality because its methodology is a priori restricted only to what can be observed or calculated.

The rest of Feser's points are similar to the points I make throughout this work.[579] Feser's *second* point is about the descriptive limits of the scientific method. The scientific method a priori restricts the field of study because its quantitative nature of inquiry narrows the inquiry only to those phenomena that are amenable to being quantified and empirically tested. Consequently, reality is constricted to that which can be thus studied. This excludes human qualitative experiences. As Feser says: "Physics focuses … only on those aspects of a

[576] M. Heller, *Sens życia i sens wszechświata*, Kraków, 2014, Ch. 2. A small digression – Heller argues that assumptions such as the existence of the external world, a subject capable of knowledge, and intelligibility of the world are not assumptions of science. That is, science is neutral with respect to these assumptions. I think we need to make a distinction between scientific activity and the possibility of its existence. From the practical point of view of doing science these assumptions are not all that important – science can function quite well apart from them. However, the question is *not* about whether we can *do* science without these assumptions, but whether scientific inquiry would even be possible and meaningful without them, for example, apart from the existence of the external world. The question is about the fundamental possibility of having science. Would there be science at all without human minds, and would it have any meaning without the existence of the world that could be studied? Heller seems to conflate the practical aspect of science – its functioning – and the possibility of there being science at all. However, the assumptions listed above are necessary for science to be possible.

[577] E. Feser, *Scholastic Metaphysics*, *op. cit*., loc.177.

[578] For further details of Feser's arguments see *ibid*.

[579] S. Barr, M. Dodds, and M. Bunge also make similar statements.

system that are susceptible of prediction and control, and thus on those aspects which can be modeled mathematically."[580]

However, trying to eliminate qualitative experience simply does not work because the truth of scientific theories is corroborated only through observation and experiment. Observation and experiment are conscious experiences and conscious experience is defined by qualitative features. Therefore, if we eliminate qualitative experience, we also eliminate the conscious experience on which observation and experiment are based. In short, eliminating qualitative experiences is incoherent and it undermines the scientific inquiry.[581]

Furthermore, physics gives us only the abstract structure of the material world. However, structure by itself does not exist. This tells us that there must be something that has that structure, that is, there is something more to reality than structure itself which implies that there is more to reality than can be revealed by physics.[582] Thus, argues Feser, science does not give us an exhaustive description of reality: "On the contrary, the very nature of scientific method shows that there exist aspects of reality it will not capture."[583]

Feser's *third* point has to do with *explanatory limits* of science – if there are limits to what science can describe, there are limits to what it can explain. Science relies on laws of nature to explain phenomena, however, they cannot, in principle, provide an ultimate explanation of all reality. The question arises as to what a law of nature is, where it comes from, and how it has any efficacy. But insofar as the mode of scientific explanation presupposes laws of nature, it cannot in principle answer these questions.[584]

Moreover, Feser points out that there are different views on what is meant by laws of nature. For example, for *Scholastics*, laws of nature stand for a way of describing how a material thing or a system behaves given its nature or essence. But in this view, the law presupposes the existence of the physical world; hence the law cannot provide an ultimate explanation of reality. Thus, this understanding of the law would not help scientism which wants to embrace laws of nature [or layers of laws of nature] as the ultimate explanation of reality.[585]

Secondly, laws of nature can be understood theologically. In this view, favored by Descartes and Newton, neither material things nor laws of nature that govern them provide

[580] E. Feser, *Scholastic Metaphysics*, *op. cit*., loc. 235.
[581] *Ibid.,* loc 265.
[582] *Ibid*., loc. 312.
[583] *Ibid*.
[584] *Ibid.,* loc. 316.
[585] *Ibid*., loc. 1200.

the ultimate explanation for the universe. It is only God's action that can explain the universe. This view is anathema to scientism's wish to have only naturalistic and materialist explanation of the universe.[586]

Thirdly, we can think of laws of nature in the Humean vein. Laws reflect neither the natures of things nor God's action, but describe regular patterns of behavior, that is, what a law of nature means is that event A is followed by event B in a regular way. However, this view of laws of nature can only tell that such and such regularity exist, but it does not explain why it exist. That is, in this view, laws of nature do not explain anything, but they are re-described in a different language. Thus, they do not provide any ultimate explanations of the universe and they are no help to scientism.[587]

Also, "laws of nature" can be interpreted as *abstract objects*, similar to Plato's Forms. They exist outside of the material realm, but material things somehow "participate" in them. This view does not provide an ultimate explanation of the physical universe because we would need to know how it is that there even is a physical universe, and how it participates in these and no other laws. That is, we would need to appeal to something other than laws. Thus the laws are not the ultimate explanation and so the view of laws as abstract object does not help scientism. [588]

Nonetheless, the proponents of scientism are so captivated by the theoretical and technological successes of science, and in particular physics, that they believe that physics will provide the ultimate explanation of reality. Feser's *fourth* point is that using the successes of modern science is a bad argument for scientism. This is precisely the type of argument used by Alex Rosenberg in his book *The Atheist's Guide to Reality*.[589] Feser nicely summarizes Rosenberg's argument:

> "1. The predictive power and technological applications of science are unparalleled by those of any other purported source of knowledge.
> 2. Therefore what science reveals to us is probably all that is real."[590]

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[586] *Ibid.,* loc. 1203.

[587] *Ibid.,* loc. 1214.
[588] *Ibid.,* loc. 1222.
[589] *Ibid.,* loc. 368.
[590] *Ibid*. Feser cites A. Rosenberg's book, *The Atheist's Guide to Reality* [2011]: "We have the best of reasons to believe that the methods of physics – combining controlled experiment and careful observation with mainly mathematical requirements on the shape theories can take – are the right ones for acquiring all knowledge (p. 24);" and "the phenomenal accuracy of its prediction, the

Adherents of scientism argue that the methods of modern science, especially physics, are the right ones to study the world, and that its success shows that reality revealed by physics is the only reality. The main problem with this attitude is that, according to it, the truth about all of reality can be completely known by one type of method. Feser points out that this is like using only one kind of a tool [e.g., a metal detector] to search for all physical objects, and then claiming that no other physical object exists [wooden spoons, etc.] because the tool did not discover them. Similarly, the tendency of the proponents of scientism is to believe that there is only one kind of method to study reality [quantitative and empirical], and then claim that nothing else exists because it is not discovered or known by this method. Effectively, the entire reality is limited to the kind of things that can be studied by that one kind of method. And even if proponents of scientism admit that there may be some questions about reality that cannot be answered by science, they tend to dismiss them as not worth pursuing because the answers would not be clear or definitive enough. Feser argues:

> "what physics does (and there is no doubt that it does it brilliantly) is to capture those aspects of the natural world susceptible of the mathematical modeling that makes precise prediction and technological application possible. But here too, it simply doesn't follow that there are no other aspects of the natural world."[591]

Furthermore, the advocates of scientism argue and try to show the superiority of their approach by trying to put metaphysicians and theologians on the defensive. I call it argument by intimidation. They demand to know the predictive successes of theology and metaphysics and, if their opponents cannot list any, they feel superior. But as Feser points out, this is hardly an impressive way to argue. It is like claiming that just because one tool happens to be successful at doing some things, all other tools should be discarded because they are useless and be replaced by it.[592] As Feser says: "that a method is especially useful for certain purposes simply does not entail that there are no other purposes worth pursuing nor other methods more suitable to those other purposes."[593] He continues: "if you will allow to count as 'scientific' only what is predictable and controllable and thus susceptible of consensus

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unimaginable power of its technological application, and the breathtaking extent and detail of its explanations are powerful reasons to believe that physics is the whole truth about reality (p. 25)."

[591] E. Feser, *Scholastic Metaphysics*, *op. cit.*, loc. 385.

[592] *Ibid.*, loc. 402-403.

[593] *Ibid.*, loc. 405.

answers and technological application, then naturally – but trivially – science is going to be one long success story."[594]

It is no surprise then that science is considered to be the only true path to knowledge. If only those questions that can be answered through the scientific method are considered worthy of investigation and all others are dismissed, then science indeed turns out to be amazingly successful.[595] However, such a claim is a not a scientific but a philosophical claim and as Feser points out, it "requires a philosophical defense."[596] In my view, Feser's arguments against scientism are compelling.

I will now turn to Michał Heller's arguments. Heller, as a theologian, philosopher, scientist, and priest, wants to preserve both the integrity of science and of the truth of Judeo-Christian faith. He argues for the clear demarcation between philosophical and scientific claims and thus against scientism.[597] Nonetheless, he proposes a philosophical or rather theological solution to the seeming conflict between science and faith which he calls Christian Naturalism.[598]

6.1.2. Heller and naturalism

M. Heller would basically agree with Feser that such assumptions as the existence of external world or intelligibility of the universe are philosophical assumptions. However, he wants to emphasize the independence of scientific investigation from philosophy. In *Sens Życia i Sens Wszechświata*,[599] he wants to make clear the distinctions between philosophical assumptions and ones that are demanded by science. He argues that although philosophers and theologians maintain that science requires certain assumptions, the problem is more complicated. He makes a distinction between what is a human psychological expectation, and what science actually demands. His argues that a statement should be admitted as an assumption of science only if science could not function without it. The presupposition of the existence of the external world is assumed by most scientists but science can function perfectly well without it. Thus, it is not a scientific but a philosophical assumption.

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[594] *Ibid.*, loc. 420.
[595] *Ibid.*
[596] *Ibid*., loc. 422.
[597] M. Heller, *Sens życia i sens wszechświata*, *op. cit.*, Ch. 2.
[598] M. Heller, *Christian Naturalism*, "Roczniki Filozoficzne", 2003.
[599] M. Heller, *Sens życia i sens wszechświata*, *op. cit.*, p. 53.

The assumption of the intelligibility of the world and rationality states that for the world to be known to human mind it must be intelligible. Again, this idea is not necessary for the functioning of science. Rather, it is dependent on the development of science, that is, the more science develops and discovers, the greater is the belief in the intelligibility of the universe.[600]

Similarly, the presupposition of the order of the universe does not qualify as an assumption of science. The order is assumed because intuition tells us that unless there is order, nothing could be studied. But the question is whether order of the universe is an assumption of science or the result of scientific investigation.[601]

Yet another assumption is the "methodological positivism" [i.e., methodological naturalism], which is basically the claim that science must reject any non-physical causes. As I have discussed in Chapter 1, this is basically the assertion of naturalism and physicalism. Heller explains that methodological naturalism is *not* an assumption of science but a part of the scientific method and is expressed in the principle of causal closure of the physical.[602] It is only a claim about the way scientific inquiry should be conducted, but it is *not* a claim about the existence or nonexistence of non-physical or trans-physical entities. The scientific method does not require an assumption of the nonexistence of God; however, it demands is that scientific inquiry remains neutral regarding the question of the existence or nonexistence of God. Heller emphasizes that the scientific method must avoid a "God of the gaps" type of explanation, but he also maintains that the scientific method does not make claims about trans-physical entities.

I would add that Heller is mostly correct. Carrying out scientific investigation does not require these assumptions – one can do science without wondering why one is doing science or what its ultimate purpose is. However, even if the practical exercise of science does not require philosophical assumptions, the existence of science, that is, the possibility of even having scientific inquiry as well as the meaning of science, demand certain philosophical assumptions about the world and the nature of an inquirer. Heller would hopefully agree with the above statement; however, insofar as his primary goal is to emphasize the purity of the scientific method, in defending scientific enterprise he seems to want to minimize the metaphysical foundations of science.

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[600] *Ibid.*, p. 61.
[601] *Ibid.*, p. 68. Heller suggests that the order of the universe can be understood as the potential to be modeled by mathematical structures. For his detailed arguments see *ibid.*
[602] *Ibid.*, p. 71.

By contrast, Feser's goal is to argue directly against scientism. He points out that scientific inquiry rests on philosophical assumptions that science itself cannot justify. Moreover, the scientific method has, by its very character, both descriptive and explanatory limits, and thus cannot be used to makes claims about all of reality. And the success of science in numerous fields of study does not entail its applicability to all reality. Although Heller's position is similar to Feser's, his approach is different. Heller stresses the independence of the scientific method from philosophical assumptions [e.g., existence of the external world]. The scientific method as such does not require any assumptions about non-physical entities, existence, or nonexistence of God. And although most scientists have them, science can function without them; thus, they are not true assumptions of science but philosophical presuppositions. In this sense, Heller is quite idealistic about the scientific method. Unfortunately, insofar as science is developed and implemented by human beings, it cannot avoid being influenced, and even being highjacked by their views or ideologies. The question is which ideology it serves. Given how the principle of causal closure of the physical is being used by philosophers and scientists who embrace ontological naturalism, physicalism, and materialism, it seems that the battle for keeping methodological naturalism in its proper boundaries has been lost, at least for now.

Nonetheless, Heller is by no means in favor of naturalism in its typical present form as a philosophical view that "everything that exists is a part of nature and that there is *no* reality beyond or outside of nature."[603] In fact, he proposes a radically different form of naturalism, namely Christian Naturalism[604] that weaves together two ways of knowing reality, one based on science and the other rooted in Judeo- Christian faith. Science is a human endeavor, and its task is to deal first and foremost with physical reality; however, it does not have to be reductionistic. Heller argues that there is no conflict between human scientific enterprise and faith in God, and it is possible to bring together modern science and Christian faith in God.

According to Judeo-Christian faith, God is atemporal hence there is no conflict or contradiction between His knowing all [His omniscience] and our human knowing which happens in a temporal framework of past, present, and future. God is the creator of all and thus all reality, including all human reality, is immanent in God. He is both transcendent to and immanent in his creation, but this does not mean creation is equal in being to God; more accurately, explains Heller, *creation is immanent in God* who confers and sustains it in existence. All human reality including its scientific enterprise is made possible by God and

[603] S. Goetz and C. Taliaferro, *Naturalism, op. cit.*, loc. 106.
[604] M. Heller, *Chrzescijanski Naturalism, op. cit.*, p. 41-58.

being immersed in God. Since God is being itself, understanding itself, knowing itself, the ultimate mathematician, and so on, there is no contradiction between human mathematical investigation and faith in God.[605]

Heller suggests monism, not only methodological but also ontological monism, as the solution to the dualistic view of reality, namely, of the separate natural world that is described by science and the supernatural world of faith in God. What he means by ontological monism is that God is immanent in all of reality, in the laws of nature, and in the boundary conditions that include biological, psychological, and spiritual factors. Thus, the reason mathematical physicists can reveal the truth about the physical universe is that our mathematical and scientific endeavors and ideas are in a way copies and fractions of the original ideas in God's mind. If our mathematical modeling can discover truth about the universe, it is because God Himself is The Mathematician. In sum, Heller's main point is that God is One and He encompasses all reality. Scientific endeavors, especially our mathematical modeling, can be successful because it is 'immersed' in God's Mathematics. Thus, in trying to explain how God can work in the world, there is no need to invoke some 'magical' acts, the indeterminacy of quantum mechanics, or chaos theory. God is in the world always and is manifest in our ability to model and discover the truth about the world. Although I basically agree with Heller, I am not convinced his use of the term ontological monism is the best idea. This term can be interpreted as materialism or idealism.[606] But it can also be too easily mistaken for pantheism.

As both a theoretical physicist and a priest, Heller wants to show that there is no contradiction between science and Christian faith. Insofar as he writes from a perspective of a mathematician, God *is* The Mathematician, and since God created the world, the intelligibility of the universe is expressed in mathematical forms.[607] This allows Heller to explain why reality can be modeled by mathematics and we, as God's creatures, can model and grasp it through mathematics. To say that God is The Mathematician is true, but it is to mention only one of His attributes, perhaps important for establishing the compatibility of faith and science but not entirely satisfying.[608] Thus, I would add that Heller's argument works if it is limited to

[605] For Aquinas God is pure understanding, so in this sense, Heller's view agrees with that of Aquinas.
[606] see Ch. 1 of this work.
[607] M. Heller, *Chrzescijanski Naturalism, op. cit.,* p. 55.
[608] For example, for Aquinas, God *is* - God's essence is His existence. God is the Creator of all things. All things come from God and as He sustains them in being. God is pure Knowing, pure Understanding, God Is Love and so on. How can we grasp the reality that God is Love through mathematical equations? The same is true for other articles of faith – immortality of the soul, resurrection of the body, and so on.

physical reality, that is, we can mathematically model and understand the universe because God, the Creator of the universe, is The Mathematician and thus the universe is intelligible, and we, as His creatures that are endowed by Him with intelligence, can model and grasp this reality mathematically.

Heller's Christian Naturalism is an attempt to bridge the seeming gap between modern science and faith. However, it may work mostly for those who are already predisposed to having or, at least, appreciating faith in God. I am somewhat skeptical it will work for most advocates of naturalism, with their determination to eliminate any notion of transcendent or supernatural, that is of God or any immaterial entities.

Thus, I would suggest that, because of the anti-theistic prejudice of the primary forms of naturalism, it might be more persuasive to engage in the discussion the principles of Aristotle and Aquinas. Not only do these principles form the foundation of scientific inquiry, but they can ease the path to being open to metaphysical principles that are not reduced to scientific principles, and thus to the possibility of being open to all reality and God.

In the next section I will recapitulate and discuss several distinctions I consider crucial to Aquinas' arguments for the immateriality of the intellect.[609] I will emphasize the distinction between the soul's essence and its powers because it explains how it is possible for the intellectual form to be both the substantial soul of the human body and yet have an operation that is not an act of the body. I will also explain why I consider Aristotle's and Aquinas' method of inquiry, rather than that of the scientific method, to be better suited to the study of the intellect of a human person.

6.2. Aristotle's and Aquinas' Response – Key Distinctions

I will now go back to the original topic of this work, namely Aquinas' arguments, based on Aristotle's concepts, for the immaterial nature of the intellectual substance, in order to highlight several distinctions I consider key to his arguments. These are:

1] the distinction between potency and act [potentiality and actuality];

2] the distinction between matter [and physical body] and the intellect, more precisely the difference between the capabilities of the intellect and of a physical body;

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[609] see Ch. 4 of this work.

3] the distinction between Aristotle's and Aquinas' method of inquiry and that of modern science – what I call the distinction between '*open'* and '*closed'* methods of inquiry.

4] the distinction between the sensitive and intellective faculties of the soul, that is, between the biological and the intellectual aspects of human being;

5] the distinction between the essence of the soul and its powers – that is, the distinction between the soul as the form of the body and the soul's different powers, some of which are dependent on the body [biological, physiological], and that which is not educed from the potentiality of the body and therefore is not dependent on the body for its being [i.e., intellective power].

6.2.1. Distinction 1 – potentiality and actuality

The concepts of potentiality and actuality are the fundamental explanatory concepts – they are at the core of Aristotle's metaphysics. Not only are they are used to explain change in all its forms [e.g., growth, corruption, becoming, sensitive knowing, intellectual knowing, the process of learning, local motion, etc.], but also matter, essence, substance, being, and its activity.

Insofar as they are the fundamental principles of the possibility of change, they are the basis of Aristotle's explanation of life and all vital activities such as nourishment, sensation, and the operation of the intellect. In a sense, *De Anima* is Aristotle's explanation of different modes of life in terms of the corresponding concepts of potentiality and actuality.

This becomes clear when we examine Aristotle's use of the concept of potentiality and actuality in his analysis of life and vital operations. As Aristotle argued in De Anima [Book I], change and motion are not sufficient to explain life, nonetheless, life is characterized by different types of change, of which local motion is just one manifestation. Change is understood as actualization of potentiality, and this in turn explains different vital operations. For example, in the case of the intellect it is the realization of its potentiality to know and to be able to act on this knowledge. This involves several grades of potentiality and actuality. First, it is the actualization of the potentiality to be instructed; second, it is actualization of the potentiality to use the knowledge; and third, it is the active use of the knowledge possessed. The corresponding concepts of potentiality and actuality also explain the operation of the sensitive faculty. The actualization of the potentiality to sense begins with the activation of the external sense organs by objects of sensation. It continues in perception by bringing

together and differentiating between qualities, and it is fully realized in the formation of an image. In short, the actualization of the power of sensation is a highly complex process that involves the sequential actualization of different potentialities. An image that is formed at the end of that process is the basis for further activity that can happen either on the purely sensitive level, such as satisfaction of pleasure and avoidance of pain, or at the beginning of intellectual operations such as the first level of abstraction.

The corresponding concept of potentiality and actuality is also at the foundation of Aristotle's notion of causality, i.e., of material cause, formal cause, final cause, and efficient cause. Matter is understood as potentiality, therefore, for matter to be or to become anything, it must be actualized by form. In other words, form confers organization and structure on matter. In this sense, form also provides matter with directionality or intention which, in turn, allows for the fulfillment of the nature of a given substance. Thus, the form, as the realization of the potentiality that provides organization, directionality, and intention, is not only the formal cause but also the final cause of a substance. The efficient cause is the actualization of the potentiality of matter to become a definite being by starting the process, which can be the maker of an artifact, a natural physical or chemical process, or biological processes and their mechanisms.[610]

Furthermore, the potentiality to be actualized is rooted in the essence of the thing. That is, the essence of a thing is expressed in realization of its potentiality to be and to act a certain way. Thus, grasping this principle also means understanding that every thing has the essence or nature which directs and affects its state and behavior, and allows for the fulfillment of its nature. If the depth of this principle is fully grasped, it becomes obvious that it lies at the intellectual basis of all science, all technology, and of all knowledge about physical universe.

In short, potentiality and actuality are at the basis of reality. And this is precisely the reason they become the first principle of the Thomistic theses "Act and potency constitute the fundamental division of every being and every order of being", and "No potency can actualize itself. A potency can be brought to actuality only by the influence of a being in act."[611]

The concepts of potentiality and actuality have been accused of being a truism or tautology, but such attitudes show the lack of the understanding of their depth and purpose.[612] They are philosophical principles and should be understood as such. They are not supposed to

[610] The bias of the present scientific attitude is to explain natural phenomena almost exclusively in terms of mechanism, i.e., efficient causality, and, to a much lesser extent, in terms of formal causality However, even causality has acquired a totally different meaning since Hume [see Ch. 1].
[611] B. J. Wuellner, *Summary of Scholastic Principles*, *op. cit*., p. 4-6.
[612] E. Feser, *Scholastic Metaphysics*, *op. cit*., p. 739.

provide explanations of exact mechanisms of physical, chemical, or biological processes. Detailed experimentation and scientific study give us further knowledge of the intricacies of natural processes [e.g., explanation on the molecular level of why steel makes stronger knives than paper or wood and thus is more appropriate for making knives]. Even if Aristotle's explanations need to be further amended by thorough scientific observation and experimentation, present scientific knowledge does not in any way belittle Aristotle's and Aquinas' success. More importantly, the concepts of potentiality and actuality can deal with questions that scientific method cannot answer. Modern science focuses on the *how* questions [i.e., explaining the mechanism of behavior], but the concepts of potentiality and actuality address the *why* questions, i.e., why a given thing acts the way it does. And answering *why* questions makes it possible to explain the directionality and purpose of a thing's acts, and hence understand its nature.

But most significantly, not only are potentiality and actuality applicable to physical reality, but they extend to include all reality, thereby offering the possibility of grasping the deepest mysteries of reality, as has been beautifully attested by Aquinas when he applies these concepts to explain the Pure Actuality of God.

6.2.2. Distinction 2 – intellect and physical body

The distinction between matter [physical body] and the intellect is based on the difference between the capabilities of the intellect and a physical body as it is presented in Aquinas' arguments for the immateriality of intellectual substance. This will involve a quick recap of Aristotle's and Aquinas' concept of matter and of a physical body. However, I will not delve into the history of the concept of matter because such a discussion is beyond the scope of this work. In the words of Ernan McMullin:[613] "to trace the story of the concept of matter is almost to trace the story of philosophy itself."[614] Moreover, as McMullin points out, there is a distinction between the concept of matter and matter as 'stuff' that is studied by physicists. Whereas the concept of matter changes depending on the conceptual-linguistic system, matter as a physical entity studied by physicists has existence that is independent of its various conceptualizations – "matter is an autonomous concrete entity."[615] At present, the primary explanation of matter is in terms of quantum physics, but even there, the multiple

[613] Ernan McMullin [1924-2011] was a professor of Philosophy at the University of Notre Dame, respected philosopher of science, and author of many books on the subject.
[614] E. McMullin, *The Concept of Matter*, Notre Dame, 1963, p. 1.
[615] *Ibid.*, p. 4.

interpretations of quantum theory expose the many difficulties in understanding the nature of matter.

In Chapter 5, I touched upon the problem of the interpretation of matter in quantum theory. At this point, I will briefly mention matter as understood by Aristotle and Aquinas. Aristotle's concept of matter is best understood: first, in the context of Aristotle's theory of potentiality and actuality; second, in relation to the concept of substance; and third, in relation to Aristotle's four causes [material, formal, efficient, and final causes].

The concepts of potentiality and actuality explain matter and form in their relation to substance. In fact, it is impossible to understand Aristotle's and Aquinas' concept of matter and its relation to substance apart from the concept of potentiality. Aristotle writes:

> "We are in the habit of recognizing, as one determinate kind of what is, substance, and that in several senses, (a) in the sense of matter or that which in itself is not 'a this', and (b) in the sense of form or essence, which is that precisely in virtue of which a thing is called 'a this', and thirdly (c) in the sense of that which is compounded of both (a) and (b). *Now matter is potentiality, form actuality*; of the latter there are two grades related to one another as e. g. knowledge to the exercise of knowledge"[616] [my italics].

Thus, substance can be understood in several senses: in the sense of matter, in the sense of essence, and in a sense of a composite of the two, but it is only substance in the sense of a composite of matter and form that has actual existence.[617] For Aristotle and Aquinas matter has *no actual being*; however, this does *not* mean it is nothing - matter is potentially. This means that matter is *potentiality* to receive form, and prime matter is this potentiality par excellence – it is the pure potentiality to receive a form and become an actual being, a substance. While the concept of potentiality explains matter's relation to substance, the concept of actuality explains form in relation to substance. Essence or form is actually, that is, it defines matter to be such a body. It defines it as a specific thing, 'a this'. Form makes matter *be* an actually existing substance. But if, for Aristotle neither matter nor form has a separate and independent existence,[618] this is not entirely true for Aquinas. He agrees that while matter has no separate existence apart from form, forms as intellectual substances do have a separate and independent existence from matter.

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[616] Aristotle, *De Anima, op. cit.*, 412a 7-12.
[617] *Ibid.*
[618] Aristotle differs from Plato by denying separate and independent existence of forms; he does not deny the existence of forms but they are always joined with matter as one composite being.

In the context of Aristotle's theory of four causes, matter or material cause is that out of which something is made. It is a passive principle of change that endures throughout a given change. In substantial change, material cause is pure potentiality for being something-or-other that endures when a single, unified substance ceases to be what it is and becomes something else [e.g., a dog dies and becomes the various substances that make up its carcass].[619] In accidental change, matter is understood as a substance, i.e., it is secondary matter. An example of accidental change is a change in size, shape, etc. – marble as a rock or statue. Aristotle's distinction between matter as pure potentiality [as prima materia] and matter that is already a substance [secondary matter] is basically a distinction between prime matter and a physical body. Matter is potentiality in both cases, however, as prime matter it is pure potentiality and it has no determinate being at all. Matter as a substance, insofar as it already exists as a composite of matter and form [a physical body], is potentiality only to accidental change. That is, its essence does not change but only its accidental properties [e.g., a human being is a human being whether it happens to be in the US or Europe, is fat or skinny, is black or yellow or white].

Aquinas' understanding of matter is rooted in Aristotle's concept of matter, material cause, and ultimately in his concepts of potentiality and actuality. Thus, when Aquinas speaks of the physical body, he does not mean prime matter, but secondary matter, that is, a composite of matter and form – a substance.[620]

Insofar as operations and capabilities of the intellect differ qualitatively from acts of the physical body, the question arises what must be the nature of the intellect? Aquinas asks: can the intellect be a physical body or an act of a body [a bodily operation]? Can it be a material form, i.e., a form that is dependent for its being on matter? What would its act and capabilities be if it were a body or an act of a body? And what do the characteristics of the intellectual act say about its nature?[621] As discussed in detail in Chapter 4, Aquinas argues that the intellectual substance is not a body, neither is it a composite of form and matter as that would

[619] M. J. Dodds, *Unlocking Divine Action…*, *op. cit.*, p. 267.

[620] However, Aquinas also speaks of the immaterial nature of intellectual substances which are substances, not in the sense of being composed of matter and form, but in the sense of being subsistent.

[621] I need to add that even though my focus is on the question of the nature of the intellectual substance, this does not mean I am ignoring the issue of the connection between the intellect and the human body but only bracketing it. For Aquinas, human being is a unity of body and intellect. But qualitative differences between the operations of the intellect and those of a body raise the question of the nature of the intellect as such. Thus, bracketing the issue of the connection of the intellectual substance to a body is a way of simplifying the inquiry about the intellect.

make it a body, nor is it a material form.[622] The intellectual substance cannot be a material form because if it were a material form, it would not differ from a form of any other material body. Since the intellectual form is not a material form which gets educed from potentiality of matter and it is not dependent on matter for its being, the cause of its existence must be external.

Having shown that the intellectual substance is an immaterial form, Aquinas offers arguments for how it can be connected to a physical body so that they are one in a single act of existence, that is, how it is possible for the intellect and physical body to be united – in other words, how they are one as an existing human being. His answer is that immaterial form can be joined with a physical body, so that they are a unity, only as its substantial form.[623] The key point is that the human intellect is a substantial form *not* in the sense of its being a separate intellectual substance, but in the sense of being subsistent, that is, not being dependent on the body for its generation [it is not educed from the potentiality of matter] or its operation.

However, the concept of an immaterial form, that is, a form whose being is not educed from a potentiality of matter and hence not dependent on matter for its being, is not allowed in the paradigm of modern science because it cannot be empirically tested or quantified. By contrast, the concept of the material form seems more tolerable to the modern mindset. For example, it can be argued that, insofar as a material form is educed from the potency of matter, such form is already incipient in matter [has potential existence in matter] and in the right circumstances it will develop or even direct the development of an organism. Thus, the concept of the material form could easily be incorporated into modern theories of biological development and evolution.

Clearly, given the principle of causal closure of the physical, Aquinas' explanation of the existence of intellectual substances does not accord with the modern scientific model. Although, as Heller argues, the scientific method as such does not make statements about existence or nonexistence of non-physical entities, the advocates of physicalism and scientism definitely make such statements. And given the predominance of their approach in science and philosophy, the notion of a separate existence of intellectual forms gets rejected.[624] But,

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[622] Aquinas, *Summa Contra Gentiles, op. cit.,* Ch. 49-51.

[623] I discuss Aquinas's arguments in detail in Chapter 4 of this work.

[624] In contrast to the dominance of physicalism and materialism, R. J. Spitzer, in his book *The Soul's Upward Yearning* and his websites magiscenter.com and crediblecatholic.com, provides explanations, arguments, peer-reviewed papers, and scientific data that attest to the transphysical being of the human intellectual soul.

as I mentioned earlier, their existence cannot be disproved by science – they elude the methodology of the scientific method.

6.2.3. Distinction 3 – open and closed methods of inquiry

The distinction between Aristotle's and Aquinas' method of inquiry and that of modern science is what I call the distinction between the *open* and the *closed* methods. Most generally, it concerns its suitability for investigation of a given subject matter; in this specific case it is the question about the best methods to study intellect and matter, each on its own terms. In other words, how can we learn about the nature of matter and the nature of the intellect without reducing one to another?

As already discussed, because of the scientific and technological success of modern science, the scientific method is now considered by many to be the only legitimate approach to investigate all phenomena. The ideal goal is to interpret all reality in terms of physics and mathematics, but this comes at a price, namely the tendency to reduce all reality to material reality and to ignore or eliminate what cannot be so reduced.

My contention is that Aristotle's method of inquiry is more suitable to investigate phenomena on their own terms, which is especially important with regard to the intellect. Aristotle begins his inquiry by observing activities of a given thing [a plant, animal, or human being] in order to understand how they [e.g., growth, reproduction, locomotion, sensing, understanding] reveal either bodily or non-bodily nature of the faculty that is responsible for a given operation. For example, the analysis of the operation of hearing and its proper object [e.g., sound] points to what makes this operation possible, in this case, it is the properly working hearing apparatus. As Aquinas further explains, since the operation of hearing is carried out by a bodily organ [a hearing apparatus], the power that is responsible for this operation is an act of a body. Similarly, when investigating the intellect, Aquinas looks at the operation of understanding and its proper objects [concepts]. His analysis of the characteristics of understanding [e.g., it is not restricted by time or space, it has the power of reflection and self-reflection, etc.] demonstrates that the operation of the intellect transcends the constraints of a material body.

Thus, Aristotle's and Aquinas' method of inquiry is open with regard to the objects of investigation. The analysis of the characteristic of a given operation and its effects reveals the character of the power or the capacity that makes that operation possible. But most importantly, one kind of operation is *not* interpreted in terms of or *reduced* to another kind of

operation. For example, sensitive operations encompass and rely on the nutritive [physiological] operations and they also alter nutritive operations to accommodate the needs of the sensitive power, however, they are not reduced to nutritive operations. Similarly, in our present state of life, operations of the intellect encompass and rely on both the nutritive [e.g., proper nutrition and functioning of bodily organs, etc.] and sensitive operations [e.g., image formation], but they are not reduced to the nutritive [physiological] or sensitive operations [sensation, perception, image formation, i.e., cognitive knowing]. The key point is that each operation is investigated on its own terms and thus it reveals the nature of the power responsible for it. It is precisely because one phenomenon is not investigated in terms of another or reduced to another that the inquiry is open with regard to its outcome, that is, to the nature of the object of inquiry.

Still, there is some similarity between Aristotle's and Aquinas' method of inquiry and that of modern science. For example, as scientists investigate matter they observe and mathematically model its behavior. This allows them to understand the characteristics of matter [e.g., mass, spin, charge, etc.] and the principles and laws that govern it. Thus, to the extent that science looks at what matter does [its behavior, activity] and its capacities [what it can do], its method is similar to Aristotle's approach in the sense that the goal of each approach is the knowledge of the behavior and nature of things.

However, there is a crucial difference between the two approaches to inquiry. Aristotle and Aquinas start their inquiries with the analysis of an operation and its effects and then go on to deduce what makes that operation possible. This approach allows them to be *open* regarding the nature of the object of inquiry. By contrast, the scientific method limits *a priori* its domain of study to that which ideally can be expressed in mathematical equations and, hopefully, empirically demonstrated. But by restricting its investigation field, it determines which phenomena are considered meaningful and ignores or eliminates anything that does not fit its model of investigation. Insofar as science deals with the material and physical world, that is, with entities that are in principle measurable and quantifiable, this *closed* approach is entirely justifiable. Thus, the problem lies not in the restrictions that the scientific method imposes upon itself, but in their being imposed upon the study of all reality, including the intellect.

In short, a problem arises when the method that is applicable to one specific subject of inquiry, e.g., material phenomena, is used to make claims about all reality.[625] The success of the empiriometric method in investigating the physical universe does not imply its suitability

[625] Feser brings up a similar point in his arguments against scientism.

to studying the intellect.[626] It is at that point that the scientific method becomes a tool in the ideology of scientism.

The unshaken faith in the scientific method as the superior and exclusive access to true knowledge manifests itself in the tendency to assert the material nature of the intellect. However, in view of such forceful conviction, it only seems fair to demand a *bona fide* proof of such a claim. This means that the burden of proof lies with physicalists and scientific materialists; moreover, it seems only reasonable to demand of them that they obey their own rules. That is, if the scientific methodology requires that all knowledge ideally be expressed in mathematical equations and, hopefully, verified empirically, then scientific materialists must prove mathematically and verify empirically that the intellect is indeed material. They must prove that matter can indeed think and understand the way human intellect can. And they must do so, neither through demagogic statements about the superiority of the scientific method nor by mockery or denial of other methods of inquiry, but solely by using the scientific method.[627] Until it is proven scientifically that matter can think, understand, and reason the way human intellect can, their assertions are just empty slogans. In sharp contrast to such demagoguery, Aristotle and Aquinas' method presents a formidable challenge to thus far unfounded claims of physicalists.

Nevertheless, there remains the question of whether the knowledge of matter can help illuminate the nature of the intellect. Using the arguments of Aristotle, Aquinas, and Barr, I have tried to show that understanding of matter does indeed illuminate the nature of the intellect. Ironically, it does so not in the way scientific materialists hope it would, but by providing a sharp contrast to the capabilities of the intellect. In short, while matter can be grasped and modeled by the intellect, the most fundamental intellectual operation of *understanding* cannot be reproduced by matter or a purely physical body.

6.2.4. Distinction 4 – sensitive and intellective faculties

The distinction between the different powers of the soul, especially the distinction between the sensitive and intellective faculties, disappeared from philosophy with the beginning of modern science. This is especially true of English philosophy.[628] Consequently,

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[626] This is also the view expressed by Feser, Dodds, Freddoso, and others.

[627] I am using the term scientific method in its most general sense, as that which has been accepted by most scientists as the best method of study.

[628] "By the time we reach modern philosophy, especially in England, the radical distinction between the two orders of faculties begins to be lost sight of. … English philosophy drifted towards

all phenomena – including consciousness, sense-perception, imagination, emotions, desiring, memory, thinking, understanding, and reasoning – tend to be lumped together under one heading of mental phenomena. But despite numerous interpretations of mind and different ways of classifying mental phenomena,[629] there has been no clear resolution to the problem of the nature of the human intellect. At present, the overwhelming tendency is to reduce all mental phenomena to physical phenomena [neuron firing and brain states]. Although there are attempts to explain mental phenomena [e.g., qualia] in non-physical terms; still, to the extent that the scientific method is considered the principal mode of investigation, the ultimate explanation of the intellect is still expected to be provided by modern science.[630]

Nonetheless, there is an increasing number of philosophers and scientists[631] that argue against physicalist interpretations of the mind. Some of them focus primarily on the relationship between mind and body and thus the Aristotelian notion of hylomorphism [e.g., Madden, Vijgen, Freddoso]. Others concentrate on the nature of the intellect and argue for its non-physical nature [e.g., Barr, Halvorson, Judycki]. Interestingly, most of the arguments[632] are based on Aquinas' insights and arguments.

Compared with various interpretations of mind and mental phenomena, Aquinas' analysis of the difference between the sensitive and intellective operations, and especially of sensitive and intellective knowing is straightforward, clear, and makes experiential sense. As already discussed,[633] Aquinas follows Aristotle' method of inquiry in which the proper object reveals the activity, which manifests the power that makes that activity possible. Thus, in

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Sensationism and Materialism, subsequently influencing France and other countries in the same direction, as a consequence, the old conception of intellect as a spiritual faculty of the soul, and as a cognitive activity by which the universal, necessary, and immutable elements in knowledge are apprehended, was almost entirely lost." New Advent Catholic Encyclopedia.

[629] It is enough to look at any reputable encyclopedia to be overwhelmed by the sheer variety of interpretations of the mind and mental phenomena. There seem to be as many theories of mind as there are philosophers or at least philosophical schools. How does one decide which one to choose? Today's trend is physicalism or mathematical idealism.

[630] Granted, there are some attempts not to reduce intellect, or rather consciousness, to matter. D. Chalmers is the most famous proponent of this approach, which he dubbed the "hard problem of consciousness'. However, he still needs to explain his ideas, and he inevitably falls back into scientific explanations – explanations in terms of something, and this something in today's science is ultimately quantum physics and mathematics. Thus, whether he wants to or not, by trying to explain consciousness and mind in terms of modern science, he cannot avoid reductionism. As E. Feser rightly points out in his *Philosophy of Mind,* all contemporary interpretations of the mind, including the intellect, are physicalist at their very core. This seems inevitable given scientific methodology.

[631] Such as Feser, Madden, Judycki, Vijgen, Freddoso, Barr, Halvorson, and Heller.

[632] With the exception of Halvorson, who bases his argument primarily on the notion of superposition in quantum mechanics.

[633] I discussed in detail the criteria Aquinas [and Aristotle] use to justify the distinction in Chapters 2-4.

sensible knowing, we start with the object and the activity [e.g., seeing], which reveals the capacity that makes seeing possible [vision apparatus]. In intellectual knowing, the inquiry begins with its proper objects [concepts] and its operation [understanding, reasoning, reflection, and self-reflection], which reveals the nature of the intellect. This approach makes it possible to distinguish between acts dependent on sensitive and operation dependent on intellective faculties. For example, insofar as imagination requires images that are ultimately obtained through sensation and then organized in perception, it would be hard to argue against image formation as belonging to the sensitive aspect of a human being. On the other hand, since our concepts and understanding transcend time and space, and the fact that we are capable of reflection about our thinking and ourselves and moreover, of reflection about reflection, shows that that intellect's capabilities [what the intellect does and what it is capable of doing] transcend those of a physical body.

Still, Aquinas clearly states[634] that in this present state of life the human intellect requires images that come from sensation. The reason is that a human being is not just a mind, nor just a physical body – he is a unity of soul and body.[635] Insofar as he is a composite of soul and body, his action is that of a composite, thus his intellectual activity needs both nutrition and energy that gets supplied by the nutritive [physiological] capacities of his being, as well as the images that are supplied by the sensitive faculties of his soul [sense-perception]. Thus, to the extent that both the nutritive and sensitive capacities [powers] are dependent on the physical body for their being and functioning,[636] damage to any of their components may result in their destruction. And since a human being is one undivided being, whose life and well-being depend on the proper functioning of those faculties, damage to them will also affect the proper functioning of the intellectual faculty.

Thus, it is entirely consistent with Aquinas' analysis of the human being that damage to the nervous system or brain would also affect the proper functioning of the human intellect in this present state of human life. To the extent that the nervous system and brain are responsible for processing of sensation, perception, imagination, and sensitive memory, damage to any of the parts involved in such processing would negatively affect the functioning of the sensitive faculty and hence sensitive knowing. And, insofar as the human intellect relies on images generated by sensitive faculties, damage to any of their components

634 Aquinas, *Summa Theologiae, op. cit.*, I, Q 84-85.
635 The detailed discussion of Aquinas argument for the unity of soul and body is in Chapter 4 of this work.
636 Material forms of nutritive and sensitive powers of the soul are dependent on matter for their being.

would also negatively affect intellectual knowing.[637] However, and this is absolutely the key, dependence on the nutritive and sensitive operations [all physiological and brain functions] in this present state of life does not entail that the intellectual operation is *per se* physical. Aquinas addresses this issue directly by making the distinction between the soul's essence and its powers.

6.2.5. Distinction 5 – the soul's essence and its powers

The distinction between the soul's essence and its powers, which are the principles of the operations of the soul,[638] is the key to understanding how it is possible for the intellectual power of the human being to be immaterial. Aquinas, following Aristotle, argues that the only way the intellectual substance can be connected to a body so that they are one in a single act of existence is by its being the substantial form of a body.[639] However, according to the principle that "everything whose being is in matter must be material,"[640] this would suggest that, as the form of the body, the human intellectual soul would also have to be material.

Aquinas answers this challenge by making the distinction between the soul's essence and its powers. He argues that it does *not* follow from the fact that the intellectual substance is in matter that it is a material form because as he says: "the soul is not present in matter in the sense of being embedded in matter."[641]

The reason is that not all operations of the soul are effected by bodily organs and therefore not all the soul's powers are acts of the body.[642] He explains that if an operation is carried out by a bodily organ, then the power of the soul, as the principle of that operation, is an act of the body; but if an operation is *not* effected by a bodily organ then the power of the soul which is the principle of that operation is *not* an act of a body.[643] Thus, all nutritive and sensitive operations are acts of the body; for example, seeing is a bodily act because it is dependent on a properly developed vision apparatus. However, insofar as the operation of

[637] Freddoso, Feser, Madden, Vijgen, Dodds, and Świeżawski offer similar analyses of hylomorphism.
[638] The detailed discussion of these arguments is in Chapter 4 of this dissertation.
[639] Aquinas, *Summa Contra Gentiles – Book Two: Creation, op. cit.*, Ch. 56.
[640] *Ibid.*, Ch. 56, 16.
[641] *Ibid.*, Ch. 69, 4-5.
[642] *Ibid.*, Ch. 69, 5.
[643] *Ibid.*, Ch. 69, 5-6.

understanding is not caused by bodily organs,[644] the intellective power which is the principle of that operation is not an act of the body.

Thus, the distinction between the soul's essence and its powers is crucial to demonstrate that being the substantial soul [the substantial form] of a body does not preclude the soul from having an operation that is not an act of a body. The soul's essence confers being and unity on a body – it makes a thing what it is. However, the soul acts through its powers – it is the soul's powers that are responsible for its proper operations. In other words, it is the distinction between the *soul as the first act of the body* [its substantial form, its essence], and *the soul's powers as the principles of its acts.*

In summary, the distinction between the soul's essence and its powers, as well as the distinction between the different faculties of the soul, are absolutely the key to explaining how a being that is one and undivided can have different capacities and perform different acts, including all nutritive operations [physiological], all sensitive operations [sensation, perception, image formation, etc.], and all intellective operations [understanding, reasoning, etc.] – that is, perform ontologically different acts [physical and intellective].

Most importantly, Aquinas' explanation is not reductionistic, that is, the complexity of the unity being is not reduced to one thing, i.e., matter, or a mathematical equation. The distinctions preserve the oneness of being with its diverse acts and operations without being 'squashed' into a straitjacket of scientific interpretation. The distinction between the sensitive and intellective faculties of the soul introduces order to our understanding of emotions, desires, perceptions. And the distinction between the soul's essence and its powers helps explain how it is possible for the human intellect to have an operation that, although in this present state of life it encompasses the nutritive and sensitive capacities and its being is dependent on the body, the intellectual operation *per se* is not act of the body. In short, it shows that there is no contradiction between the intellectual substance being a unity with a physical body and having an operation that is not dependent on a body for its being.

6.3. Summary and further thoughts

I have argued that, in contrast to the scientific method, which *a priori* restricts its field of investigation to physical reality, Aristotle's and Aquinas' method of inquiry is *open* toward the objects of investigation, including non-physical phenomena. Moreover, Aristotle's and

[644] It is the immaterial character of the objects of understanding that shows that the operation of understanding is not effected by a bodily organ.

Aquinas' method is *not* reductive. Understanding of a given operation does not require interpreting it in terms of another operation. This is especially important with regard to intellectual operation.

Sensitive operations [sensation, perception, sensory knowing, and desiring], although they rely on nutritive operations [physiological functions], are not reduced to physiological functions, that is, they have their own identity as sensitive operations. Nevertheless, insofar as sensitive operations are fully dependent on the physical body [sense organs, proper objects such as color, sounds, etc.], they are absolutely suited to further investigation by the physical and biological sciences, which indeed have revealed intricate physical details of sense-perception and its dependence on physiological functions including the nervous system.

Furthermore, insofar as abstract concepts are the proper objects of the intellectual operation, they reveal the *universal* aspect of the operation of understanding. And since universality is not a property of particular concrete objects, they indicate the immaterial character of the intellectual operation. In short, in contrast to the *a priori* restrictions [e.g., causal closure of the physical] of the scientific method, which limit the investigation to physical entities, Aristotle's *open* method of inquiry allows for the existence of non-physical intellectual operation.

Aquinas uses the distinction between the physical body and the intellect to argue for the immateriality of the intellectual substance. This distinction rests on several key points. First, the method of inquiry makes it possible to investigate the respective acts/operations of the intellect and a physical body. Second, the inquiry allows for observation of the difference in the capabilities of the intellect and the physical body. Third, the principle that 'acts follow essence' makes it possible to discern that the distinction in respective capabilities between matter and intellect is ultimately rooted in their essential differences. Still, Aquinas' distinction between matter and intellect cannot be fully appreciated apart from his concepts of: 1] primary matter as pure potentiality to being informed by substantial form; 2] secondary matter being the composite of form and matter [a physical body] as the potentiality to being informed only by accidental forms; and 3] material form [a form educed from the potentiality of matter]. Furthermore, the difference between the characteristics of the physical body and the intellect illuminates the distinction between sensitive and intellective powers of the soul.

It is crucial to recognize that both the distinction between the capabilities of intellect and a physical body and that between different faculties [powers, capacities] of the soul are possible because of the method of inquiry. It is Aristotle's *open* method of inquiry that leads from the observation of an activity and its proper objects to the power that makes that

operation possible. The proper objects of an operation allows the distinction between operations that are physical [physiological and sensory] and intellective to be made. And the essential characteristics of the proper objects of an operation reveal the nature of the operation.

Most importantly, Aristotle's method of inquiry can account for each operation on its own, that is without interpreting one operation in terms of another or reducing one to another [intellect to matter/neuron firing]. At the same time, it shows that, insofar as an intellectual operation relies on images provided by the sensitive faculty and on the physiological functions, the intellectual operation is to some extent dependent on the body to perform its operations. However, even though it relies on the body [images, physiology], the intellectual operation itself is not physical, as is shown by both its proper objects [e.g., abstract ideas, concepts] and its characteristics [e.g., reflexive, self-reflexive, knowledge of universals, unrestricted by space and time].

A typical question in philosophy of mind is how the mind affects the body. If they are two ontologically different entities, i.e., if mind is non-physical, it cannot affect the body which is physical. Since I already discussed in detail Aquinas' solution to exactly this problem [Ch. 4], I will restate only the key points. Aquinas shows that intellectual substances cannot be material or corporeal. This means that the connection between the intellectual substance and the body cannot ever be via the contact of quantity because, as the connection between two physical bodies, that can happen only in the physical realm. Thus, he argues, the connection between the intellect and a body can only be by *contact of power* which is capable of affecting the entire entity. However, the contact of power is not enough to explain how an intellectual substance can be united to a body so that they are one in a single act of existing. Aquinas' answer is that this is possible only if the intellectual substance, which is an immaterial form, is the substantial soul of the physical body.

Still, there remains a question: how it is possible for the substantial form [intellectual form] be one with the physical body and yet have an intellectual operation is not an act of the body. This is where Aquinas makes a key distinction between the essence of the substantial soul and its powers, which is the distinction between the soul as the first act of the body [its substantial form, its essence] and the soul's powers as the principles of its acts.

This distinction also helps answer another problem, namely how it is possible that in a living human being, his intellectual operation is *not* an act of the body and yet needs the body for its proper functioning. Again, Aquinas' distinction between the soul's essence and its powers helps solve the problem. The human substantial soul is *one,* but it includes different

powers [nutritive, sensory knowing, appetitive, intellectual knowing]. As long as a human being is alive, his intellectual activity is dependent on the physiological and sensory aspect of his being [nutritive and sensitive powers of his soul]. His intellect needs images to form concepts, and sensory cognition needs the physiological processes to support image formation.

Aquinas solves the problem through the separation of powers and their operations within the unity of being human. In other words, it is the multiplicity of the soul's powers within the oneness of human being. The powers have their respective operations, they affect and influence each other but they retain their own identity and being. Sensory operations rely on the physiological operation, but they are not reducible to them [e.g., the taste of water is not reducible to a water molecule]. The intellectual operation of understanding relies on sensory operations and thus also on physiological operations, but it is not reducible to either of them. Ideas and concepts use images provided by sensory operation, but they are not reducible to those images. In short, the operations of understanding, understanding of meaning, knowing, and judging must use concepts that have been abstracted from sensory images which in turn have been dependent on the physiological processes of the sensory apparatus, but they are not reducible to them – they are not reducible to neurons firing.

So why is it so difficult for many philosophers of mind and neuroscientists to accept this explanation? Actually, the answer is quite simple. It is because they embrace only one method of inquiry, namely that of modern science, regardless of whether this method is suitable to investigate all phenomena. And if a phenomenon does not fit its methodological principles, for example the modern view of causality [e.g., causal closure of the physical], they either seeks to reduce it to physical or a quantifiable phenomenon, or to *a priori* reject it.

As long as we regard the scientific method as the only legitimate path to true knowledge, and outright reject other methods of inquiry, including that of Aristotle and Aquinas, we will never be able to accept any phenomenon that does not fit the scientific model, such as the immateriality of the intellectual operation and the subsistence of the human intellectual soul.

This does *not* mean that scientific investigation is not suitable to the study of the human being, who is the unity of the body and soul in his sensory and physiological being. However, I want to stress that, insofar as a human being is a unity of body and sou, his acts are acts of the human being that is they come from the entirety of his being, this does not entail that there can be no ontological difference between the powers of the soul that are responsible for those acts.

One of the main points I want to emphasize is that it is not science itself, but rather the philosophical attitudes of naturalism, scientific materialism, physicalism, and scientism that pose a threat to the notion of the immaterial nature of the intellect. These attitudes are rooted in the absolute faith in the power of the modern science to provide answers to all questions regarding human beings and the universe. Granted, this faith is not entirely unfounded, as it is based on the impressive successes of modern science and its technological applications over the past three-plus centuries. Without a doubt, modern science has accounted for the immense progress in biology, chemistry, physics which has fueled the advancements in medicine, engineering, computer science, and other technological applications.

It would be absurd to question the success of modern science and technological advances, and I am *not* at all interested in disputing these accomplishments. Rather, I want to bring into question the philosophical attitudes such as scientism that piggyback on the successes of modern science. It is a fact that despite its fantastic success, modern science has not been able to explain the fundamental operations of the human intellect of understanding, the formation of abstract concepts, and the understanding the meaning of concepts. In short, it has not been able to explain the nature of the intellect. But regardless of the obvious failure, the adherents of naturalism, physicalism, materialism, or scientism are convinced that the intellectual operation is either reducible to or it can be explained in materialistic and physicalist terms.

It is to this absolute faith in modern science that I have proposed an alternative understanding of the intellect, specifically, an understanding that comes from Aristotle's and especially from Aquinas's arguments for the immaterial nature of the intellectual operation. It is important to emphasize that Aquinas' understanding of the intellect does not in any way compete with scientific explanations.

The main point for my discussing materialism, physicalism, and scientism was not to get entangled in their arguments but to bring out the effect of their approach on the understanding of the being of human being. I argue this effect is detrimental as it tries to reduce the human being to a purely physical entity. Advocates of these positions hide behind the success of science to argue their position without being able to supply supporting evidence to prove their point. However, by trying to identify human being with matter, they strip a human of the dignity of having intellect and will that transcend the physical realm. They are also unable to explain how it is possible to be one undivided human being while having a physical body and immaterial intellect**.**

Nevertheless, if the problem is not, as argues Heller, with the method of inquiry per se, this implies that the scientific method is simply not suitable to the study of the entirety of human being because it *a priori* limits the field of inquiry to the exclusively physical realm. And while it is an appropriate method to study the physical aspects of human being [physiological and sensory], it fails to explain the intellect.

CONCLUSIONS

The primary goal of this work has been to argue for the immateriality of the human intellectual operation. The reason for choosing this topic was an attempt to respond to the predominant contemporary tendency towards reducing human intellectual operation – and by extension human being – to a purely physical entity. I have argued primarily from within Aristotle's and Aquinas' philosophy, specifically their philosophy of the human nature. My aim has been to emphasize the enduring value of Aristotle's method of inquiry and Aristotle's and Aquinas' arguments. I hoped to underline their method as more appropriate to the study of human being. By being open with regard to an object of inquiry, their method is not reductive, i.e., it does not have to reduce or explain one operation in terms of another. Thus, it makes it possible to appreciate and distinguish each vital operation of the human being on its own terms, e.g., intellectual operation as such does not have to be reduced to physiological reactions. This approach preserves the non-physical aspect of human being, and by extension his spiritual dignity.

Nonetheless, it is constantly emphasized by Aquinas that, as human beings, we are not two different substances somehow joined together but we are always a unity of physical and spiritual. As long as we live, we are and we act, not as not as minds or physical bodies, but always as one being – body and soul. This also means that our physical being [sense-perception and image formation] affects our intellectual operation and vice versa. Thus, the more we know about the physiological, biological, and even psychological processes, the more we learn about our being and how it can influence our intellectual operation. This is where the strength of science and its methodology is invaluable and can increase our knowledge, without being reductive, patronizing, or ideological. In addition to presenting a thorough analysis of the relevant aspects of Aristotle's and Aquinas' philosophy, I have also discussed several examples of contemporary arguments for the immateriality of the human intellectual operation from both philosophy and from interpretation of quantum theory.

Insofar as my work is a critique of physicalist interpretations of the intellect, I began the discussion [Chapter 1] with some philosophical background that I [and others] maintain have contributed to the reductive approaches to human being. Specifically, this includes an historical narrowing of the concept of causality as well as an unqualified, practically ideological espousal of the scientific methodology with regard to the study all of reality and of human being. I did not engage directly with any of the specific arguments from the field of

philosophy of mind because their answer to the question about the intellect is ultimately sought within the context and methodology of physical science.

Chapters 2 and 3 were devoted to Aristotle's concept of the soul. This involved a detailed explication of his approach and the development of the definition of the soul and its powers and activities. In chapter 4, I focused on Aquinas' arguments for the immaterial character of the intellectual substance and its only possible connection to the body as its substantial soul. I underlined the key points in his arguments, specifically the main differences between physical bodies and intellect and the key distinction between soul's essence and its acts. The latter distinction is crucial in explaining how an intellectual soul, although it is the form of the human body and thus makes it one undivided human being, nevertheless has its own operation independent of the physical body.

Chapter 5 was devoted to contemporary arguments for the immateriality of the intellect based on the interpretation of quantum theory, specifically the role of the observer in quantum phenomena. I also included several arguments from philosophy. Admittedly, all of them support the immateriality of the intellect and, insofar as they focus on the capacities of the intellect as distinct from that of physical bodies, they echo Aquinas' arguments. These arguments stand in bold relief against physicalist assertions that the intellect must be physical. What I wanted to stress is that besides their ideological statements, they do not have any scientific proof that matter *per se* can think, i.e., that matter has the same capacity as human beings for understanding, understanding meaning, concept formation, or intellectual creativity.

In chapter 6, I briefly went back to the problem of scientism and naturalism and presented two arguments that are in a way responses to those positions. What is really interesting about these arguments is that, even though they seem to agree in principle, their approaches are very different. Feser exposes the philosophical assumptions of science to underscore the illogical approach of scientism. Heller makes a clear distinction between philosophy and scientific method, but he also offers a common meeting ground for both science and Christian faith through what he calls Christian Naturalism.

In the second part of chapter 6, I go back to Aristotle and Aquinas and make several distinctions that I consider crucial to their arguments for the immateriality of the intellect: 1] potentiality and actuality; 2] intellect and physical body; 3] Aristotle's method of inquiry and the scientific method; 4] the sensitive and intellectual faculties of the soul; and 5] the soul's essence and its powers. I argue that these distinctions – each in its own way and all of them together – make it possible to explain different vital operations of the human being without

reducing one to another, and thereby accommodate immaterial operation of the intellect within, as Aquinas puts it, the unity of a human being in a single act of existence.

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The stated goal of this work was to argue for the immaterial nature of the intellect, primarily through the arguments of Aristotle and Aquinas. I hope I have managed to bring out the depth and beauty of their insights but also the enduring value of their arguments. What is clear is how germane their arguments are to the present debates, if not battles, about the nature of the intellect. Moreover, what has become evident during this journey is the weakness of philosophical assumptions about the intellect that lie behind scientific materialism, physicalism, or scientism. Their weakness consists in placing *a priori* limits on the inquiry, and, therefore putting *a priori* limits on that which, in principle, cannot be limited – the intellect.

As both Aristotle and Aquinas argue, the intellect cannot be contained, restricted, or limited in its capacity to know. It is no-thing. The intellect is the potentiality to know all and in knowing it becomes that which it knows. If it becomes defined, it is defined not physically but through its power of abstraction and concept formation – through understanding and understanding the meaning of things. Even if the human intellect is not perfect, it has the potentiality to become more perfect through ever more profound understanding and knowledge. Neither can the intellect be a physical body, nor can it be reduced to the brain in the nervous system, simply because being so physically instantiated would restrict its practically infinite[645] capacity to know.

This journey started with the question of the soul – of the first act of the body potentially alive. But it could not stop there. Undoubtedly, the soul as the form of the body, that is, as its principle of organization, can indeed be seen only as that. And in most of the living world, the soul is just that – it makes a thing what it is, it confers being and defines it. It is primarily a principle of organization. But the quest for the soul inevitably leads to the question of the intellect, and thus to the intellectual form as the substantial soul of the human being. But why? Why could we not simply stop at the sensitive soul of an animal? After all, insofar as this kind of soul represents all physiological [such as growth, reproduction, survival] and sensitive capacities [such as sense-perception, imagination, appetites, desires] of the human being, it is a truly appropriate subject of science. It can be well understood and

[645] Only God's intellect is infinite because God's essence is pure understanding and knowing.

studied by the methodology of modern science and, ultimately, it may even be interpreted in terms of physics and mathematical equations.

The reason is that the question of the intellect is unsettling. How can we account for its strange capabilities? Abstraction, understanding, reasoning, creativity, science, philosophy, religion, morality – how can we explain all these unusual and extraordinary activities within the physical world? Clearly, the desire of scientific materialists or physicalists is to express the intellect in terms of matter or perhaps even in terms of pure mathematical forms. But we must ask – would this quench our thirst for understanding our being, a being whose intellectual power transcends the limitations of the physical universe? And while this physical universe may be studied, modeled, and expressed in elegant mathematical equations, the pressing question is – can the intellect ever be so captured?

Thus, the question… why is there this need, if not obsession, to try to reduce the intellect to matter and its interpretation to mathematical forms? Perhaps the desire behind this need is not only the desire for knowledge but is ultimately a hunger for some control and power. If the intellect is entirely understood, then it is possible to have power over it and possibly some control over the rest of the universe. In view of this, it is terribly ironic that the quantum world remains a mystery to us in that it presents a challenge to our human arrogance. And yet the quantum world does allow us to peek into it and steal an occasional glimpse of exact knowledge of it, even if momentarily. But this can be done only if the intellect transcends it. Yet the ultimate question is, would we be satisfied if we had total knowledge, control, and power over our intellect and the universe? Would such a world be an answer to our quest? Would it satisfy our hunger?

I argue that Aristotle's method of inquiry is necessary for the study of the entirety of human being because it is open and not reductionistic, i.e., it is able to accommodate each vital operation on its terms. Because of that I suggest that it should be reconsidered and taken seriously as a valid method of inquiry. I believe that since the development of modern science, Aristotle's method of inquiry has not been given its due justice, which has led to unfortunate consequences with regard to the understanding of the human being. I maintain that modern and contemporary science are critical to our ability to understand the universe and improve human lives. What I propose is not turning back to 'old times', but allowing ourselves to benefit by merging insights from both paths to knowledge – philosophy and science. They do not have to stand in opposition, but can instead help and support each other by offering complementary insights. Science is, at present, quite secure in its position, but I

contend that philosophy, instead of cowering before the mighty accomplishments of science, must regain its proper object of inquiry – the search for Wisdom and for the essence of things.

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