

THE FOUNDATIONS OF
WISDOM

VOLUME 2

PHILOSOPHY
OF NATURE

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PHILOSOPHY OF NATURE

FR. SEBASTIAN WALSH, O. PRAEM.

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PREFACE

Hunting for Happiness

The discovery and development of philosophy is part of man's larger search for happiness. As man was hunting for happiness, he found philosophy. Much of human ingenuity and energy was originally directed towards removing the obstacles to happiness: for example, the arts of hunting and agriculture were developed to alleviate hunger; the art of housebuilding was developed to alleviate the suffering associated with excessive heat and cold; various martial arts and weapons were developed to protect against violence from animals and other men; medicine was developed to cure illness. But once these arts had been developed, and man had time for leisure, it became apparent that there exists in man a more fundamental desire than food, clothing, and bodily health. It is a desire not merely to avoid evils, but a desire for some positive good, and it is a desire for a positive good which is not merely instrumental to something else (such as practical knowledge), but a good desired for its own sake. Aristotle expressed this desire simply in the statement: "All men by nature desire to know."

It may seem strange that happiness should have much to do with knowledge. After all, very few men dedicate real effort and time to searching for knowledge. What knowledge they do search for tends to be practical in nature: that is, it is for the sake of making

or doing things. And yet, it is an indisputable fact of history that once the chief practical arts had been established, and the needs of the body provided for, men naturally turned to philosophy in their leisure time. Aristotle recounts that “after all such arts had been developed, those sciences were pursued which are sought neither for the sake of pleasure nor necessity. This happened in places where men had leisure. Hence the mathematical arts originated in Egypt where the priestly class was permitted leisure.”¹ And again: “When nearly all the things necessary for life, leisure and learning were acquired, this kind of prudence began to be sought.”² But if this is so, how do we account for the fact that so few people consider knowledge to be essential for happiness?

This question is like the question of why so few children prefer a high paying job or an excellent education to ice cream. First of all, since the goods of the body are better known than the goods of the soul, it is natural that men should seek to provide for the goods of the body first. Secondly, happiness is not found in the possession and exercise of just any knowledge, but only in the best knowledge, and this is very difficult to achieve. Just as it would be impossible for a child to perform well at a high paying job or to receive an excellent education all at once, so it would be impossible for someone to acquire and use the knowledge needed for happiness without first passing through years of experience and study. Finally, notice that Aristotle did not say all men by nature desire to *come to* know, but rather that all men by nature desire to know. Samuel Johnson once famously quipped about seeing a famous landmark in Ireland that it was “worth seeing . . . but not worth going to see.” There is a similar relationship

¹ *Metaphysics* 981b22-24 (independent confirmation of the leisure afforded the priestly class in Egypt is found in Gn 47:22).

² *Metaphysics* 982b22-23.

between knowing and coming to know. Coming to know can be arduous and even painful. But if you asked the man on the street whether he would like to know some important truth if it took no effort, I suppose nearly everyone would say yes. As it is, because many obstacles stand in the way of possessing knowledge, there are few who seek it.

So philosophy is near the end of man's search for happiness. But even within philosophy itself there is an order of discovery which naturally arises from the search for happiness. For we want to know the supreme good of man, but to know that we need to know what man is, and since man is a natural being, we need to know what nature is. So philosophers began to examine nature. But once these things had been worked out in outline, it became clear that the nature of man is difficult to know, that it is even difficult to know about the existence and nature of the soul, and that the highest perfection of the human soul, wisdom, is even more difficult to know. Therefore, it was necessary to develop one final art: logic, which assists us in coming to know difficult truths well. Plato's Socrates seems to have been the first to acknowledge a need for an "art about arguments" in the *Phaedo*, precisely as he is searching to discover the existence and nature of the human soul.

The order of discovery in philosophy is almost inverse to the order in which philosophy should be learned. First, students should study logic, which is the art that treats of acquiring the good of speculative reason: truth. Since every science searches for truth, logic teaches how to proceed correctly in every science. Second, they should study mathematics, which among the sciences is the easiest in which to find certitude (hence there is much agreement in this part of philosophy). Third, they should study natural things (natural philosophy). Fourth, among natural things, they should focus their study upon living things, especially

man (the study of the soul). Fifth, once they know accurately the nature of man, and the various powers and perfections of the soul, they should study the good for man (ethics). And since man's supreme good consists in knowing things better than himself, the philosopher should study the first cause of all being (wisdom or metaphysics) last.³ For the very exercise of knowing these things higher than man is the happiness which man desires. That is, natural happiness consists in contemplating the truths which are the conclusions of metaphysics.

Because this is only an introduction to philosophy, this text will not consider the last part of philosophy (metaphysics). Such a consideration belongs not to the beginning student, but to an advanced student. Moreover, because the science of mathematics is widely taught, and much easier than the other parts of philosophy, this text will not consider that part of philosophy either. Perhaps the best elementary treatment of mathematics according to its proper method can be found in Euclid's *Elements*.

Finally, this text will not proceed by a primarily historical method, as is typical in most introductions to philosophy. The order of history in philosophy is not necessarily a progression from ignorance to knowledge or error to truth. It is quite possible for an earlier philosopher to know more than a later one. Nor is the order of history necessarily the best order for the beginning student to follow if he is in search of truth. This text does not seek to inform the student about the positions taken by various philosophers, but rather to lay out the method best suited to human nature of coming to understand the order among the ultimate causes of reality. We study the Pythagorean theorem not to know what

³ This order of study is laid out by St. Thomas Aquinas at the beginning of his *Commentary on Aristotle's Nicomachean Ethics* and at the beginning of his *Commentary on the Book of Causes*.

Pythagoras thought, but because it is true and worth knowing. It would be worthwhile to study the same theorem even if it was discovered by Frankie Watkins. In philosophy, we are not so much concerned with who discovered some truth as with the truth itself, and how it can be known. While much of what is found in this text will be truths discovered by Aristotle and Saint Thomas Aquinas, they stand on their own and do not rely upon the authority of those who first discovered and presented them.

Introduction

In the first quarter of this introduction to philosophy, we studied logic, the art of reasoning well, in order to acquire the basic tools necessary for demonstration. Logic, like any tool, is therefore meant to be used for the sake of something else, something better than itself. In this quarter we will begin to make use of the tools we acquired in logic in order to come to know truths about the natural world in a rigorous and scientific way.

The Place of Natural Philosophy among the Arts and Sciences

Practical and Speculative Truth

Not all truths are equal. Some true things are good to know because of something we can make or do with those truths. For example, it is good to know a recipe or a phone number in order to make a cake or to call a friend. In themselves, the recipe or the phone number do not perfect you as a human being. In fact, we would think it strange or even disordered if someone were to read a phone book just for the sake of memorizing the numbers, without any intention to call them. Their goodness is completely relative to the thing you can make or do with them. We call such truths *practical truths*: that which is known for the sake of making or doing something.

Now since everything useful is useful for something better than itself, it must follow that the best things of all are useless. That is, they must be good for their own sake, and not for the sake of anything better than themselves: they are the best things. To be useless is not the same as being worthless. In the order of knowledge, we call these best truths *speculative truths*: those which are known for their own sake, not for any other reason. Speculative truths in themselves perfect you as a human being—to know them makes you a better man, a more perfect man.

One of the customs of modern men is to value knowledge to the extent that it is practical: “Knowledge is power,” one famous adage states. But this custom does not stand up to close scrutiny. Practical knowledge is a knowledge to produce order in something. But any order produced by human reason is less perfect than human reason, since the cause of a thing is more perfect than the effect (for nothing gives what it does not have). Hence, it follows that practical knowledge cannot perfect human reason. On the other hand, speculative knowledge is derived from an order already found in things. And since this order proceeds from the divine mind (as we shall show at the end of this quarter), it follows that the order discovered by human reason in things can perfect the human mind by uniting the human mind with a mind greater than itself.

From this we can see that speculative truths are better and more conducive to perfecting a man than practical truths. Hence, it is the speculative truths (truths good to know for their own sake) that are to be valued as having the highest worth and dignity.

The Place of Natural Philosophy in the Whole Body of Knowledge

In the first quarter, we drew up a roadmap of all things that can be known. It is time to return to that roadmap to identify where natural philosophy fits among the things that we can know.

Recall: Everything that can be known has an order. But order is related to reason in three ways. There is:

1. the order produced by reason (the arts or practical sciences);
2. the order discovered by reason (the speculative sciences); and
3. the order revealed to reason (sacred theology).

Since natural philosophy regards the order found in the natural world, natural philosophy obviously concerns the order discovered by reason in things. Hence, natural philosophy is one of the speculative sciences. For example, we find in the natural world that the immature always comes before the mature, as a boy before a man, or a puppy before a dog. That's an order already found in things, not something we put there. But there are also other sciences concerned with the order found in things, such as mathematics. How is natural philosophy separated from these other sciences?

One way to determine the different kinds of reasoned-out knowledge (science) is to see what kinds of definitions are used in arguing to the conclusions of that reasoned-out knowledge. Remember that we discovered in the first volume that science is the conclusion to a demonstration, and every demonstration has a definition as its middle term. Hence, if I have a different kind of definition, I will have a different kind of conclusion or science. Let's take an example: If I were to define a triangle or a circle, would I be right to include some kind of material, such as metal or wood, in the definition? No. Mathematical triangles and circles are not made of wood or metal or any particular kind of matter. I might find a wooden or metal triangle somewhere, but the particular material would not be part of what it means to be a triangle. On the other hand, when I define natural things, like horses, trees, or gold, I see that the material out of which they are made is essential to what they are. Flesh and bones are essential to horses: without them a horse would not truly be a horse. Wood is essential to trees. Metal is essential to gold. So I can say that the science of mathematics is different from natural philosophy in this way: the subjects studied in mathematics are not defined

with any matter, but the subjects of natural philosophy are defined with some kind of definite matter.

There is also another speculative science called metaphysics (which means after or beyond the physical). This science is about immaterial substances like angels and God. We will prove the existence of immaterial substances later on, but for now let's take it for granted that such immaterial beings can exist. How then would we distinguish mathematics from metaphysics? Both are about things which are defined without matter. A mathematical triangle is defined without matter, and so is an angel, so what's the difference? One important difference between the subjects studied in mathematics and metaphysics is that the subjects of mathematics are quantities, and those quantities cannot exist on their own. They have to exist in something else, namely a substance. And the substance in which these mathematical subjects exist are material. So the subjects studied in mathematics exist in matter, even though they are defined without matter. On the other hand, angels and God are substances. They exist on their own. So they are defined without matter *and* they exist without matter.

In summary, we can say that the three speculative sciences are distinguished in this way: natural philosophy is about things which exist in matter and are defined with matter; mathematics is about things which exist in matter, but are defined without matter; and metaphysics is about things which exist without matter and are defined without matter. This is represented in the figure on the next page.

	Exists in Matter	Exists without Matter
Defined with Matter	Natural philosophy: Things which exist in matter and are defined with matter (men, horses, trees, minerals, etc.)	
Defined without Matter	Mathematics: Things which exist in matter but are defined without matter (triangles, circles, cubes, etc.)	Metaphysics: Things which exist without matter and are defined without matter (angels and God)

Figure 1

By the way, notice that there is a fourth logical possibility: a science about that which exists without matter, but is defined with matter. Why don't we have four speculative sciences? Because while something which exists without matter and is defined with matter is a logical possibility, it is not a *real* possibility.⁴ The reason that it is not a real possibility is because the human mind is immaterial, so it is able to consider material things without matter, but it cannot consider immaterial things as if they had matter. Being immaterial itself, the human mind can consider things in an immaterial way. The fact that the human mind is immaterial is something we shall prove at the end of third quarter.

⁴ A helpful example to illustrate the difference between a logical and real possibility can be taken from mathematics. Let us divide up straight-sided geometrical figures into those which are closed and those which are open. Again, let us divide these into those with three or more sides and those with two or fewer sides. There are, therefore, four logical possibilities: (1) closed with three or more sides (for example, a triangle or a square); (2) open with three or more sides (for example, a figure in which one of the sides is missing, leaving it open); (3) open with two or fewer sides (for example, an angle); and (4) closed with two or fewer sides. This fourth logical possibility is not a *real* possibility, since two straight lines cannot enclose an area.

But when we say that the human mind considers material things without matter, doesn't this mean that these definitions are false? For example, isn't it false to define a triangle without matter? The answer is that it is one thing to consider A apart from B, and another thing to say that A exists apart from B. For example, I can consider my dad without considering his weight. When I think about whether I should love my dad, I would normally think about that without considering his weight. For that matter, I don't consider his height, the number of hairs on his head, or many other things that have nothing to do with whether or not I should love my father. By considering my dad without considering his weight, height, etc., I have not asserted that he does not have weight or height. This would be to say something false. I simply see that those other things are unimportant and do not need to be considered in determining whether I should love my dad. Similarly, it is possible to consider certain shapes like circles and triangles and squares without considering the matter of the things in which they are found. When I prove that a triangle has interior angles equal to two right angles (180 degrees), it is not important to determine what kind of matter this triangle is made of. So I consider that triangle without considering its matter. That is not to assert that there are triangles existing in the world that have no matter. This would be false.

In summary, we can say that natural philosophy is a speculative science (i.e., a reasoned-out knowledge about an order which reason discovers in things). In addition, natural philosophy is the speculative science about things which exist in matter and are defined with matter. The place of natural philosophy in the whole body of knowledge is schematically represented in the figure on the following page.

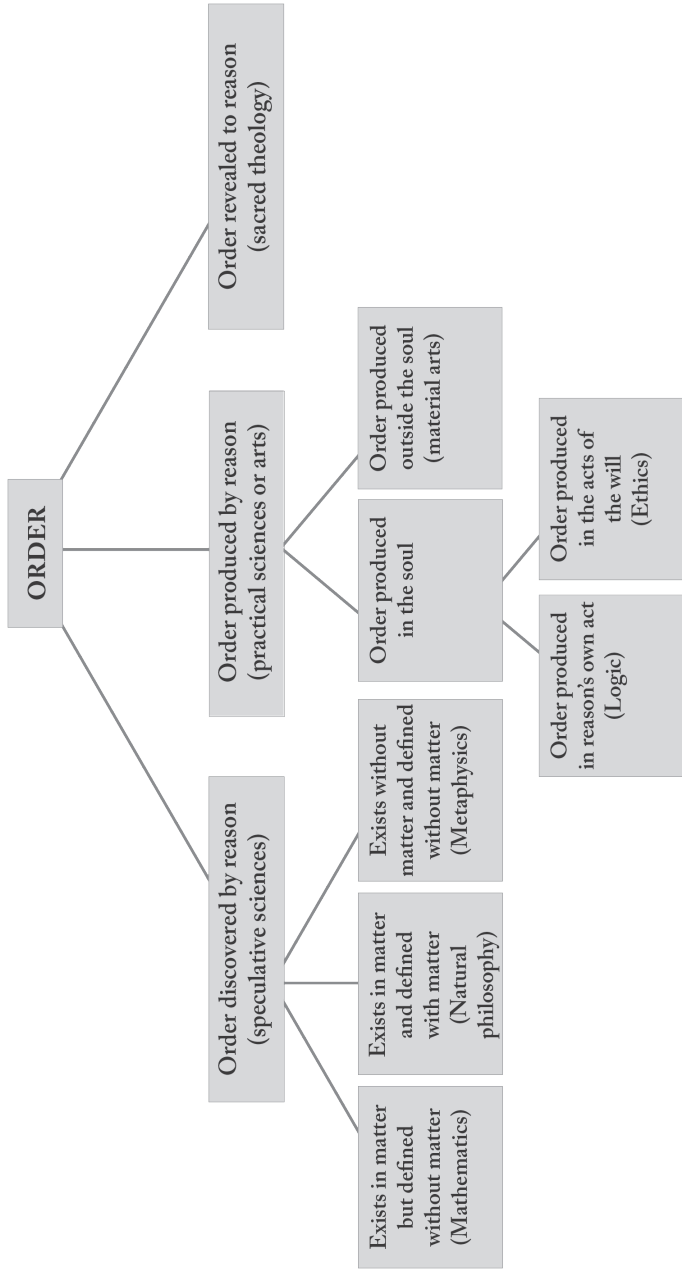


Figure 2

Summary

- Natural philosophy is a speculative science, which means that it is knowledge worth knowing for its own sake, not merely as a means to some useful product.
- Speculative science is better than practical science since it perfects the human mind and is a kind of participation in the divine wisdom.
- This is because speculative science involves discovering an order which is in things, not an order put there by the human mind.
- Natural philosophy is about things which exist in matter and are defined with matter.

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Introduction

THIS IS A STUDY GUIDE to accompany volume 2 of *The Foundations of Wisdom: An Introduction to the Perennial Philosophy* (Natural Philosophy). In this study guide I will explain the overall structure of volume 2 and how to read the text of volume 2. I will also include essential, chapter-by-chapter questions you should be asking and answering as you read through the text.

Logic as a Prerequisite for Natural Philosophy

If you have not already read the first volume of this series (Logic), or if you have not at least studied classical logic, you are not equipped and prepared to benefit fully from this text. Logic is a prerequisite to the study of natural philosophy, and so before reading this book, you should set it aside and learn some logic. For example, in this book I will define nature and motion. I will also demonstrate conclusions such as the fact that every mobile is divisible, and nothing mobile moves itself. These demonstrations use self-evident and *per se* statements. Unless you have studied logic, you will not be in the best position to judge these definitions or arguments. Logic teaches the road to follow in every science, so it should be learned before the others.

The Need for a Teacher

In the study guide for logic, I touched upon the need for a teacher in philosophy, or in any difficult matter. Since natural philosophy is among the things which are difficult to learn, and which require much experience, natural philosophy cannot be learned well simply from a book. No book, no matter how well-written, is sufficient as a guide for the life of the mind. Therefore, I reiterate the conclusion I reached before about logic: I strongly recommend that, in addition to reading the natural philosophy book and this accompanying study guide, the reader should try to find someone who already knows this subject matter well who can fulfill the role of a teacher.

The Overall Plan of the Natural Philosophy Book

This book is divided into two parts. In the first part (chapters 1-4) I cover some preliminaries to the study of natural philosophy. In the second part, I consider natural things (chapters 5-15).

Before making an investigation of natural things, a few things have to be considered as preliminaries: the place of natural philosophy among the other sciences and arts; the subject of natural philosophy (what natural philosophy is about); and the method to be followed in natural philosophy. These preliminaries are considered in chapters 1-4. And since natural things are movable things, I also consider the question about the possibility of motion in chapter 4.

Once these preliminary matters have been considered, the book considers natural things. This is divided into three parts: the general principles of natural things and our knowledge of them

(chapters 5-10); the consideration of natural (i.e., movable) things themselves (chapters 11-13); and the consideration of the ultimate causes of motion (chapters 14-15).

One could divide it as such:

Part I: Preliminary Matters (Chapters 1-4)

Chapter 1: The place of natural philosophy among the other sciences and arts

Chapter 2: The subject of natural philosophy (what natural philosophy is about)

Chapter 3: The method to be followed in natural philosophy

Chapter 4: The possibility of motion

Part II: Natural Things (Chapters 5-15)

Chapters 5-10: The general principles of natural things and our knowledge of them

Chapters 11-13: The consideration of natural (i.e., movable) things themselves

Chapters 14-15: The consideration of the ultimate causes of motion

Using Supplementary Texts

Some chapters refer the student to supplementary texts in the footnotes. These texts are, for the most part, original texts of great thinkers. Depending upon the abilities of the teacher and students, as well as upon the time you have to complete the course, these supplementary texts can be very helpful to examine a subject in greater detail. If the teacher is very knowledgeable and familiar with the supplementary text, and the students are more advanced, these texts will be very helpful for increasing the student's knowledge of natural philosophy. However, the course can be completed without reading the supplementary texts. They are options for those who desire to use them.

How Much Reading and Study Time should be Devoted to Each Part?

The time needed to cover the materials in this book is the sum of the time it takes to read the book and cover the material in class. The amount of time it should take a student to read the book carefully is approximately fifteen to twenty hours. The amount of class time to cover the contents of this book should total to somewhere between forty-five to sixty hours. So a student should expect that the total amount of time necessary to cover the entire contents of the natural philosophy book with this accompanying study guide will be between sixty and eighty hours.

As a ballpark figure, chapters 1-4 should take approximately ten to fifteen hours to read and discuss; chapters 5-6 should take approximately ten to fifteen hours to read and discuss; chapters 7-10 (with the Appendix) should take approximately fifteen to twenty hours to read and discuss; and chapters 11-15 should take approximately twenty-five to thirty hours to read and discuss.

These are simply estimates based upon my experience teaching this material. There may be reasons or circumstances why a particular student might use significantly more time than what is recommended here, but it would be unusual that a student would need significantly less time than the 60 hours recommended here.

List of Important Definitions for Natural Philosophy

THE FOLLOWING DEFINITIONS ARE IMPORTANT for understanding natural philosophy. Because definitions are the seeds of all of our knowledge and are presupposed to everything else we can know, the student should memorize all of these definitions. The best way to memorize these definitions is to sit down with a partner and verbally ask one another the definition of each term on this list. Once you can quickly repeat the definitions three times without making a mistake, you can go on to the next one on the list until all of them are memorized. Some of these definitions pertain to the earlier chapters (like the definition of principle), while others pertain to the later chapters (such as the definitions of time and place).

- Principle (ch. 2):** The first thing from which something is or comes to be.
- Cause (ch. 2):** That upon which anything depends for its being or coming to be.
- Element (ch. 2):** The first material cause of a thing which is indivisible with respect to its form.
- Nature (ch. 7):** An intrinsic principle of motion and rest which is first and *per se*.
- Matter (ch. 5):** That out of which something comes and which remains in it.
- Form (ch. 5):** That which makes a thing to be what it is.
- Agent (ch. 8):** The first source of a thing's motion or coming to be.
- End (ch. 8):** That for the sake of which something is or comes to be.
- Privation (ch. 5):** That out of which something comes and which does not remain in it.
- Motion (ch. 11):** The act of the potential insofar as it is potential.
- Place (ch. 12):** The first, immobile surface of the containing body.
- Time (ch. 12):** The number of motion according to before and after.
- Chance (ch. 10):** An agent cause which acts outside the intention of the agent and rarely.

Chapter 1

What to Look for in Chapter 1

Try to understand clearly the distinction between speculative and practical knowledge, and why speculative knowledge is better than practical knowledge.

Notice the different usages of the words “matter” and “material” in reference to the division of the speculative sciences based upon their separation from matter.

Summary and Explanation of Chapter 1

Chapter 1 considers the place of natural philosophy among the various arts and sciences. The first distinction needed to place natural philosophy among the other branches of knowledge is the distinction between speculative and practical knowledge. Therefore, at the beginning of chapter 1 the book considers this distinction and argues that speculative knowledge is better and more worth knowing than practical knowledge. This conclusion is counter-intuitive for modern students, who are accustomed to hearing that practical knowledge is the best kind of knowledge. This is understandable, since the goods provided by practical knowledge are closer to the senses and, therefore, better known to us. For example, food and shelter are very well-known goods, and they are the result of practical knowledge, such as agriculture and architecture. Nevertheless, what is better known to us is not always better in itself. The statement that the whole is greater than its parts is better known to us than the statement that the human soul is immortal, yet the latter statement is clearly better in itself than the former statement.

After showing that natural philosophy is situated among the speculative sciences, the book goes on to distinguish between the three branches of speculative knowledge (mathematics, natural philosophy, and metaphysics). This distinction is based upon their different relationships to matter.

Questions about Chapter 1

What is the key difference between practical and speculative knowledge?

Why is speculative knowledge better than practical knowledge?

How do we know that natural philosophy is a kind of speculative knowledge?

What are the two divisions used to differentiate the speculative sciences?

Given that there are two divisions used to differentiate the speculative sciences, why aren't there four speculative sciences?

What is meant by matter when it is said that some things exist in matter, or some things are defined with matter?

The division of speculative knowledge into three species implies that a division based upon different ways of being immaterial is a species-making difference. What would have to be included in the definition of knowledge in general (i.e., knowledge considered as a genus) for different ways of being immaterial to make specifically different kinds of knowledge? (Hint: consider the definition of species-making difference from the last book.)
