PHILOSOPHY OF NATURE
LET THOMAS AQUINAS TEACH IT

by

Joseph Kenny, O.P.
St. Thomas Aquinas Priory
Ibadan, Nigeria

2012

PREFACE

Philosophy of nature is in a way the most important course in Philosophy. Metaphysics and philosophy of the nature of man are more important because what they treat, but these sciences are grounded in Philosophy of Nature. To understand the nature of man, one must first understand the basic principles of nature. And if philosophy/science of nature fails to discover any immaterial being, there can be no Metaphysics.

This work presents summaries and texts from Thomas' Commentary on Aristotle's *Physics*, along with his *De principiis naturae*. Find the full texts of these and others at http://www.josephkenny.joyeurs.com.

Thomas often states that for natural science, unlike mathematics, wide experience is necessary. This text presupposes familiarity with general science, especially familiarity with developments in astronomy, concerning the origin of the universe, and discoveries of its contents and activity. I have many videos that can go along with this text.

Philosophy of nature is indistinguishable from philosophy of science. The student should be familiar with the most prominent theories in circulation today, and be able to critique them. A starter in this direction is Anthony Rizzi' *The science before science: a guide to thinking in the 21st century* (Baton Rouge: Institute for Advanced Physics Press, 2004).

The order of this text is based on the general methodology Thomas provides in his Commentary on the *Posterior Analytics*, namely, that every science has a subject, principles and properties. The following chapters go from an introduction (1) to the subject of natural science (2), its intrinsic principles (2-4), its properties (4-9), and finally its extrinsic principles (11-13).

Plan of the course

1. Introduction: What is Philosophy of Nature in the scheme of philosophy and science
2. The subject of natural science and its intrinsic principles
3. Thomas' essay, *The principles of nature*
4. Chance and causality —since natural causes are the principles of demonstration
5. The meaning of motion and its various species —since motion is the basic property of natural things
6. Concepts subsidiary to motion, such as the infinite,
7. place, space, void,
8. time.
9. The three species of motion, with answers to objections to the possibility of motion
10. The divisibility of motion and rest —towards determining the efficient cause
11. The efficient cause of motion, and its requisites. Can it be eternal?
12. The existence of God: Three ways Thomas rejects, and his first 2 ways
13. The existence of God: The last 3 ways, and those in Thomas' *Commentary on John*

CHAPTER 1
DEFINITION OF PHILOSOPHY OF NATURE

What is science? (Book 1, Lesson 1)

Refer to the *Posterior Analytics* for a definition of science: It is knowledge of a universal fact through proper causes. Science (in Arabic *al-`ilm*, in Greek επιστημη) is a technical term for knowledge of a determined subject, an attribute which is the property of that subject (having the same extension) and the cause of that attribute, which is to be found in the nature (the form or matter) of the subject and also in external final and efficient causes. Such knowledge is demonstrative, because it is knowledge of the fact and the proper reason for the fact. Demonstration, in Aristotelian tradition, is not a means of discovery, but an analysis of knowledge already gained from experience and research.

The division of speculative sciences

Sciences are distinguished in two ways:

- By their relation to **matter**: since every science is in the intellect, and things are made intelligible to the intellect by their abstraction from matter, therefore according to their different relationship to matter there will be different sciences.
- By their **definition** of the subject: Since the middle term of demonstration in a science is a definition of the subject, according to different definitions there will be different sciences.

Consequently, according to the different relations to **matter**, expressed in different **definitions**, there will be different sciences:

1. There are certain things whose being depends upon matter, and which cannot be defined without matter, i.e. physical things.
2. There are certain other things which, although they cannot exist except in matter, nevertheless sensible matter does not enter into their definition, i.e. mathematical things.

The two differ as do "circle" and "plate". For a plate is in sensible matter, and sensible matter necessarily enters into its definition–for a "plate" is "circular"–and such are all **natural** things, as for example, man and stone. But a circle, although it cannot exist except in sensible matter, nevertheless sensible matter does not enter into its definition–and such are all **mathematical** things, as for example, numbers, magnitudes and figures.

3. But there are certain things which do not depend upon matter either in their existence or in their definition. This is because either they are **never** in matter–as is the case with God and the other separated substances–or because they are **not universally** in matter–as is the case with substance, potency and act, and being itself.

Concerning the latter, therefore is **Metaphysics** (3). But concerning those things which depend upon sensible matter according to existence but not according to definition is **Mathematics** (2). Concerning those things which depend upon matter not only according to existence, but also according to reason, is **Natural Science**, called **Physics** (1).

The subject of natural science

Since we are studying natural science, it is necessary to begin by assigning its **matter** or **subject**. Since whatever has **matter** is mobile or changeable, it follows that "**mobile being**" is the subject of natural science.

Natural science [or philosophy] is about natural things. What are natural things? Natural things are things whose principle, or source of activity, is their own intrinsic nature, as opposed to **artificial** things, which have the actions **we** give them. **Nature**, as we shall see, is defined as "the principle of motion and rest in that in which it is". Therefore, natural science is of those things which have within themselves

the principle of motion.

The division of natural science

Whatever is **common** to a whole group of things should be treated first and distinctly, and then one can go on to add what is **peculiar** to different species within the group. Therefore, just as for all the sciences of different types of **being** there is a first science which treats of **being in common**, namely first philosophy [or metaphysics], so too for all the sciences which treat of the different types of **mobile being**, it is fitting that there be a first science which treats of mobile being in common, and this is the *Physics*. Aristotle's works thus treat of:

–mobile being in common: *Physics*

–mobile being specifically:

–according to **local** motion: *On the heavens* (cosmology)

–according to motion to **form**:

–the elements:

–as to their transmutations in common: *Generation and corruption* (chemistry)

–as to special transmutations: *Meteorology*

–the compounds:

–inanimate: *Minerals* (chemistry cont.)

–animate: *The soul* (biology) & his many books on animals, sensation and other activities.

Methodology

Aristotle lays down two things in relation to the **order of procedure** in natural science:

- One must begin from the consideration of **principles**;
- Among principles, one must begin from the **more general**.

Beginning from principles

All science is from a knowledge of **causes**, since it is by virtue of knowing the cause that one is able to see and explain why a certain **conclusion** is true.

Likewise the **definition** of the subject, which is the middle term in proving the conclusion, is a statement of the **causes** of the thing.

Hence we have Aristotle's statement in the *Posterior Analytics*, Book 1, that "a complete definition is a demonstration differing only as to format". In other words:

- whereas in a **demonstration** one may use one cause to demonstrate another as, for example, proving from the **purpose** of a boat, which is to float [final cause] that one must use a certain **material**, such as caulking compound [material cause] to make it watertight,
- in a complete **definition** all four causes are aligned one after the other on the same level–as if one were to define a boat as "a sea-going construction [formal cause] made by man [efficient cause] out of water-resistant materials [material cause] for the sake of making it seaworthy [final cause]".

Going from the more generic to the specific, there is the following sequence: **principle, cause, element**. Thus:

- An **element** is "the primary things **out of which** a thing is composed, and is **in** it" (cf. *Metaphysics*, V) –such as the letters of a word, but not the syllables.
- A **cause** is "that from which something comes, **with dependence in being or in becoming**" –Thus things which are **outside** of a thing, or are not its primary components, may be causes, though not elements.
- A **principle** "that from which something comes **in any way**". Thus something is able to be a

"principle" without being a cause, as the starting-point of a motion.

These terms are sometimes applied to different causes from which demonstrations are made in the various sciences:

- "Principle" –to the moving/ agent/ efficient cause, where especially there is an order of proceeding.
- "Cause" –to formal and final causes, from which a thing especially depends for its being and becoming.
- "Element" –properly to the first material causes.

Not all the sciences demonstrate through all the causes:

- Mathematics –uses only the formal cause.
- Metaphysics –uses the formal and final causes principally, but also the efficient.
- Natural science –uses all the causes.

Beginning from more general principles

An argument why we must begin so:

Whereas to proceed in knowing from what is better known to us to what is better known by nature, is natural for us,

And whereas confused, universal things are better known to us,

Therefore we must proceed from the more universal to the singular [i.e. the specific].

The **major** proposition is based on the fact that since the things best known by nature [i.e. the most immaterial things] are less known to us, and since we proceed from things we know to things we do not, therefore we must go from things which are better known to us to the things which are better known by nature.

The implication is that things which are better known **by nature** are absolutely better known. Why should this be held? It is held because the degree of **knowability** depends upon the degree of **being** of that which is known, and this in turn depends on the degree of **actuality** of the thing. Whence those things which are most in **act** are most **knowable**.

Since whatever is **material** is to that extent **potential** [to any form], it follows that to the extent that something is separated from matter, or **immaterial**, to that extent it will be more **actual**, and thereby more **knowable** in itself.

Our knowledge, however, begins from material, sensible things, which are more known **to us**, but less knowable **in themselves**. Such things are intellectually knowable only in potency, until by abstraction they are divested of their individual matter [quantitatively "marked"]. At this time they become intellectually **knowable** [through the action of the agent intellect] and then [by being imprinted upon the possible intellect] actually **known**. There are thus three stages in the intellectual knowledge of a material thing:

1. A material thing is actually knowable to the **senses**, which receive the imprint of the sensible form united to matter, but only **potentially** knowable to the intellect, since the thing is in a singular material state.
2. The form of the material thing received by the senses is, through the action of the **agent** intellect, divested of individual material characteristics and rendered intellectually **knowable**.
3. This intellectualized form is now imprinted upon the **possible** intellect, and becomes intellectually **known**.

It is clear, therefore, that our knowledge, even of material things by the intellect, is only progressively actualized from potency to act.

Those things are more known absolutely which are more known in themselves. But those things are more known in themselves which have more of being–since each thing is knowable in so far as it is being. But those things are more beings which are more in act–whence such things are most knowable by nature.

But the opposite occurs with us, by virtue of the fact that we proceed in intellectual knowledge from potency to act, and the beginning of our knowledge is from sensible things, which are material and intelligible in potency–whence these are known to us prior to separated substances, which are more known according to nature, as is evident in *Metaphysics* II.

Now Aristotle says both "better known and more certain", since in the sciences there is not sought any kind of knowledge, but **certitude**.

As to the **minor** proposition, by "confused" is meant things which contain within themselves some things in potency and indistinctly. And since to know something indistinctly is mediate between pure potency and perfect act, therefore when our intellect proceeds from potency to act, that occurs to it first which is confused before that which is distinct. But science is then complete in act when one arrives by means of resolution at the distinct knowledge of principles and elements. And this is the reason why "confused" things are prior known to us before "distinct".

Why are the universals which the intellect knows, initially called "confused"? They are called thus simply because they are generic and contain their species only in potency. One "clarifies" them by arriving at the clear knowledge of the species at first only potentially present:

> Now that the universals are confused is plain, since universals contain within themselves their species in potency–and whoever knows something in a universal way, knows it indistinctly. But its knowledge then becomes distinct when each of those things which are contained in potency in the universal, are known in act–for he who knows "animal" knows "rational" only in potency. But one knows something in potency prior to knowing it in act. According, therefore, to that order of learning by which we proceed from potency to act, "animal" is known by us prior to knowing "man".

The statement that we known universals before singulars appears to contradict another statement of Aristotle in *Posterior Analytics*, Book 1, to the effect that singulars are better known to us, but universals by nature or absolutely so. This difficulty is explained simply by recognizing that in that particular passage Aristotle is talking about **sensible** singulars known by sense knowledge as prior to **intelligible** universals known by the intellect, and which, as abstract from matter, are more knowable in themselves. In the present case Aristotle is talking of the progress of knowledge **in the intellect**, from universal or generic knowledge to knowledge of the "singular", by which is here meant the **species**. Species, as having more of form, are by comparison with genera, more known:

> It should be understood that Aristotle in the *Posterior Analytics* takes as singulars the very sensible individuals. These are more known to us, since for us sense knowledge, which is of singulars, precedes intellectual knowledge, which is of universals. But since intellectual knowledge is more perfect–universals being intelligible in act, but not material singulars–universals are more known absolutely and according to nature.
>
> But here in the *Physics*, by "singulars" Aristotle does not mean the individuals, but the species–which are more known according to nature, as having more perfect existence and distinct knowledge. But genera are prior known to us, by a knowledge that is in potency and confused.

Three signs also indicate that we must begin from more general principles.

1. Just as a **sensible whole**, such as a house, is seen by us prior to distinct knowledge of its parts, so in the intellect the generic universal is known before the perception of its species.
2. Just as an **intelligible whole** contains the parts of its definition in potency, and they are made actual by the definition, so too the universal is known before its species. Thus one knows man vaguely before recognizing "animal" and "rational" as its defining parts.

This seems to contradict the tenet that one knows the generic "animal" before the specific "man"; actually one does, but not as a part of the definition of man. Thus one has first the generic idea "animal", then a more specific idea "man", then a still more specific idea of "animal" and "rational" as the defining

parts of man.

3. **More universal sensible things** are first known: Seeing someone come from a far off **place**, we first recognize "animal", then "man", then "Socrates". Likewise in the order of **time**, a child sees his father first as a "man", then as "Plato"; hence the observation that "a child begins by calling all men 'father'". From this it is clear that we first know something confusedly before we know it distinctly.