NOTE FOR BOOK ONE OF NATURAL HEARING, READING I

In this reading, which is the Proemium to the eight books of *Natural Hearing*, Aristotle first states the goal of natural philosophy which is to know the causes of natural things and then the order of determination or consideration in natural philosophy which is the general before the particular. He also touches upon its order being *toward matter,* but he does not elaborate upon this.

All the natural philosophers before Aristotle witness to the end or goal of natural philosophy for they all sought the causes of natural things.

When Aristotle reasons out that we should know natural things and their causes in general before in particular, one should not think that he is contradicting himself when he says elsewhere that we know the particular before the general. This would be the mistake from mixing up the senses of a word. For the words *general* and *particular* have different meanings in these two contexts. When Aristotle says elsewhere that we know the particular before the general, the word *particular* means singular or individual. And *general* there means universal. Since we sense before we understand, and the senses know only singulars or individuals while reason understands the universal, particular in the sense of singular comes before general in the sense of universal. Singulars come before universals in our knowledge. But when he says here that the general comes before the particular in our knowledge, both general and particular name a universal. But *general* means the *more* universal and particular, the *less* universal. When we say that Socrates is a particular man, *particular* means individual or singular. When we say that dog is a particular kind of animal, particular means something less universal.

Thus, although singulars come before any universals in our knowledge, among the universals, the more universal comes before the less universal. And the reason Aristotle gives for this is that our reason, as well as our senses, know things in a confused way before distinctly.

Someone might think that, since our knowledge begins with the singulars and the less universal is closer to the singular than the more universal, that therefore the less universal would come before the more universal in our knowledge. But this is to forget that the singular is known by the senses and the universal by reason and reason knows the universal in a confused way before distinctly.

If one set out to identify the kinds of plants on a campus, one's knowledge of those plants would begin with one's senses and therefore with the singular plants. But as one begin to know the kinds of plant there are on campus, which is to know the universal, one would know tree and grass, for example, before the kinds of tree or the kinds of grass. And the reason for this is that to know tree is confused in comparison to knowing the particular kinds of tree and likewise to know grass is not as distinct knowledge as that of the kinds of grass. Further, since the difference between grass and tree is much greater than between different kinds of tree or between different kinds of grass, the former difference is bound to be seen before the latter differences.

The reason Aristotle gives in this reading why we know the general before the particular is that we know in a confused way before distinctly and the general is confused in comparison to the particular which involves more distinction.

But that we know things in a confused way before distinctly, or that the confused is before the distinct in our knowledge, is shown by Aristotle in two ways. He gives a reason *why* this is true and he gives three kinds of examples (under which one could give as many particular examples as one wishes to do) to show *that* we know things confusedly before distinctly. The reason is very profound, but difficult to understand. Hence, we very much need the examples.

The first kind of example is most known to us. It is the sensible put together whole. When we first here a symphony, we do not distinguish the instruments playing clearly. And when we first taste a salad dressing, we do not immediately pick out the ingredients. This kind of example shows that we know the confused before the distinct, which is the reason why we also know the general before the particular. But also since the general is to the particular like a whole to its parts, we can reason that if the whole is known before the parts than the universal whole is also known before the particulars. (The Greek word here for general is taken from the Greek word for whole, just as the word particular is taken from the word *part*.)

The second less known kind of example is the understandable put together whole, the definition. We name a thing before we can define it. But the knowledge we have when we can define it is more distinct. We can name a dog or a chair, but we would have to think for a while to be able to define them.

The third kind of example is from something in the senses that resembles going from the general to the particular. We see something (a singular) on the horizon before we recognize that it is a dog and we recognize that it is a dog before we recognize that it is John's dog, Rover. This is also true in time as well as distance, as in Aristotle's example. When we see twins, it takes time before we can distinguish them.

The reason Aristotle gives why we know things in a confused way before distinctly is that what is more known to us is less known and what is less known to us is more known. A thing is more known when it is known distinctly than when it is known in a confused way. But we know it more in a confused way. It is *more known to me* that I am drinking red wine than that I am drinking Cabernet Sauvignon, but the wine I am drinking is *more known* when it is known to be Cabernet Sauvignon that when it is just known to be red wine.

One could ask why what is more known to us is imperfectly known and what is less known to us is more perfectly known. Since our senses and reason are able to know before they actually know and are ignorant before they know, and to know something in a confused way is between not knowing it at all and knowing it fully, as our senses or reason go from ability to act, they know things in a confused way before distinctly. Since imperfect knowledge comes before perfect knowledge in us, the imperfectly known (which corresponds to imperfect knowledge) is for us before the perfectly known (which corresponds to perfect knowledge). Hence, the imperfectly known or less known is more known to us and the perfectly known or more known is less known to us.

There is something like this in the development of any other ability. If I develop my muscles gradually lifting weights, those I first lift do not result in as great strength as those I do later. But the weights I first lift are more productive of strength *for me* then than would be the heavier ones I can lift later. The latter would hurt rather than develop me in the beginning.

Man loves the private good and sensible good before he loves the common good and the understandable good. But the latter are more lovable, being greater goods. So what is more lovable *to him* in the beginning is less lovable and what is more lovable is in the beginning less lovable *to him*.

The common reason is that the development or education of any ability goes from the imperfect toward the perfect so that what is first for us is the imperfect and what is second or last for us is the perfect.

Since the confused is more known to us than the distinct, and what is more known to us is more certain for us. We are more sure or certain of the confused than the distinct.

However, someone might object that when we are confused, we are mistaken. And how can we be more certain or sure when we are mistaken?

But this objection is a mistake from mixing up two senses of *confused*. When Aristotle says that the confused is more certain, he does not mean by *confused* mixed up or mistaken, but merely indistinct or vague knowledge.

A simple example will bring out the distinction between being mistaken and having an indistinct knowledge. If I think that *a dog is a cat*, I am confused in the sense of being mistaken. But if I think that a dog is an animal, I am not mistaken although I do not distinguish the dog from the cat. I have a confused *knowledge* of dog for the dog is truly an animal.

If I think a glass of cabernet sauvignon is a glass of zinfandel, I am mistaken. But if I think it is a dry red wine, I have a true but confused knowledge, an indistinct knowledge of what I am drinking.

Descartes, in his *Discourse on Method*, seems to identify certitude and clarity or distinction. While Aristotle arrived at his conclusion by a syllogism (the confused is more known to us and what is more known to us is more certain for us), Descartes seems to be influenced by a third figure enthymeme (mathematics is more certain and mathematics is more distinct). The syllogism is, of course, a much stronger argument than a third figure enthymeme. Descartes may also be mixing up different senses of the words *confused* and *clear and distinct*.

Descartes' fundamental mistake can lead to two kinds of error. If he is very sure about something, he thinks he knows clearly and distinctly what it is. If he is sure that he thinks, he thinks he must know distinctly what thinking is. And if he has clear and distinct thoughts about the natural world (like mathematical ones), then they must surely be true.

Some modern physicists have come back to the position of Aristotle that the confused is more certain than the distinct. Pierre Duhem, at the turn of the century (between the 19th and 20th centuries), saw this. Duhem concluded that "There is a sort of balance between precision and certainty: one cannot be increased except to the detriment of the other."[1] And in the physics of the twentieth century, both Louis de Broglie, the father of wave mechanics, and Heisenberg, who formulated the principle of indeterminism in quantum mechanics, came from their own experience to see the truth of Aristotle's position and rejected that of Descartes. Louis de Broglie asserts finally that "we could hold, contrary to Descartes, that nothing is more misleading than a clear and distinct idea."[2] And Heisenberg, in his Gifford Lectures, stated that "Furthermore, one of the most important features of the development and the analysis of modern physics is the experience that the concepts of natural language, vaguely defined as they are, seem to be more stable in the expansion of knowledge than the precise terms of scientific language"[3]

Since the knowledge of the general is more certain or sure or stable than the knowledge of the particular, and knowledge based on common experience is to knowledge that requires some private or special experience as the general is to the particular, it follows that knowledge for which common experience is sufficient is more sure and certain than knowledge based on some private experience. By common experience we mean the experience which all men have and cannot avoid having, such as the experience of whole and part or of change. By private experience, we mean the experience which only some men have, whether by observation or experiment or some other means.

The eight books of *Natural Hearing* require only our common experience of change and natural things while the experimental sciences require some private

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[1]Pierre Duhem, *The Aim and Structure of Physical Theory* , Princeton University Press, N.J., 1954, p.179

[2] Louis de Broglie, *The Revolution in Physics*, Chapter 10, Noonday Press, 1960, p. 219

[3] Werner Heisenberg, *Physics and Philosophy*, Harper & Bros., N.Y., p. 200

experience. Since the more sure or certain is not replaced by the less certain, let alone by the uncertain, it is clear why the knowledge we acquire from the eight books of *Natural Hearing* are not replaced by the more exact knowledge and opinions acquired in the experimental sciences of the natural world.

Thomas teaches that merely to consider something in general and in particular alone does not distinguish habits of the mind:

> scire in universali et particulari non diversificat scientiam nisi quantum ad modum sciendi; non autem quantum ad rem scitam, a qua habitus habet unitatem.[4]

However, the experimental sciences differ from the knowledge taught in the eight books of *Natural Hearing* not only by being particular, but also by being mathematical and in being an offshoot of the intertwining of knowledge of natural things with the mechanical arts, the union of natural science and technical science as Heisenberg calls it.

We have said that Descartes' great mistake and that of many others may come partly from mixing up the sense of *confused* meant by Aristotle here ands the bad sense of *confused*. Consider the way Thomas takes the word confusion in this text:

> ...confusio sit ex inordinata permixtione aliquorum.[5]

This disorder is error or a cause of error. Hence, when someone is mistaken, we often say he is "mixed-up".

Likewise, there is a way in which the words *distinct* and *precise* might be used for the certain or firm assent of the mind which could give rise to the mistake of thinking that the distinct is more certain. Consider the use of these words, for example, in the following text of Thomas:

> Quandoque vero intellectus non potest determinari ad alteram partem contradictionis neque statim per ipsas definitiones terminorum, sicut in principiis, nec etiam virtute principiorum, sicut

[4] *De Veritate*, Q. 14, Art. 12, ad 1
[5] *Scriptum Super Lib. III Sentientarum*, Dist IV, Q. I, Art. II, Sol. I, In Resp

> in conclusionibus demonstrativis est; determinatur autem per voluntatem, quae eligit assentire uni parti determinate et praecise propter aliquid, quod est sufficiens ad movendum voluntatem, non autem ad movendum intellectum, utpote quod videtur bonum vel conveniens, huic parti assentire. Et ista est dispositio credentis, ut cum aliquis credit dictis hominis quia videtur decens vel utile.....
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> Sententia autem, ut dicit Isaac et Avicenna (lib. II Metaph.. cap. iv, et lib. VIII cap. vi) est conceptio distincta vel certissima alterius partis contradictionis; assentire autem a sententia dicitur."[6]

Consider also the use of *precise* in this text of Thomas:

> Quidam enim dicunt, quod cum Adam non habuerit simpliciter omnium rerum scientiam, sed quaedam cognoverit, et quaedam ignoraverit....in aliis autem quorum scientiam non habebat, sicut sunt cogitationes cordium et futura contingentia, et singularia a sensu absentia, poterat quidem falsam aestimationem habere, leviter in huiusmodi aliquid falsum opinando, non autem ita quod praecise assensum praeberet. Et ideo dicunt, quod in eum error cadere non poterat, nec iterum falsa pro veris approbare, quia in his designatur praecisus assensus ad id quod est falsum.[7]

If we think of reason when it doubts as not precisely or distinctly adhering to either side of a contradiction, but when it is certain as assenting precisely or distinctly to one side, we might be led astray to think that reason is more certain in its precise knowledge, but uncertain when it is undetermined or confused as to which side is correct. But when you give me a glass of Cabernet Sauvignon, I will assent more firmly to *this is a dry red wine* than to *this is a glass of Cabernet Sauvignon*. But *dry red wine* is confused or indistinct in comparison to *Cabernet Sauvignon.*

The teaching of Aristotle in this Proemium to the eight books of *Natural Hearing* is very useful for logic and understanding some of the order in our thinking.

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[6] *De Veritate,* Q. 14, Art. 2, C

[7] *De Veritate*, Q. 18, Art 6, c

It helps us to understand why distinction, division and definition are so necessary in our thinking. Distinction, division and definition are all necessary for our reason to go from the confused to the distinct. Without distinction, division and definition, our reason would remain in confusion. There are many kinds of distinction, division, and definition which are studied in logic and how they can be made.

This also helps us to understand why we name things before we can define them. And it also helps us to understand why the first part of a definition is the genus to which differences are gradually added.

And it also helps us to understand how mistakes are made by overlooking some distinction that needs to be seen.

There is reason to think also in ethics that part of our problems come from not understanding the general before the particular. Some people try to understand human virtue before they have understood virtue in general. Virtue in general is as universal as a thing having its own act. In this sense, a knife or the eye has a virtue as well as a man. And perhaps we should understand what is good in general and what in general is better before we try to understand what is good for man and what is better for man. In general, what is good? And in general, what is better?

Sometimes students of this Proemium draw a false conclusion as to the order of learning First Philosophy or Wisdom and Natural Philosophy. Consider first the following text of Thomas:

> Philosophus enim primus habet cognitionem rerum in principiis universalibus. Medicus autem considerat res maxime in particulari: unde non accipit immediate principia a primo philosopho, sed accipit immediate a naturali, qui habet principia magis contracta quam primus philosophus. Naturalis autem, cuius consideratio est universalior quam medici, potest accipere immediate principia suae considerationis a primo philosopho.[8]

[8] *De Veritate*, Q. 9, Art. 1. Ad 3

The above explains why act and ability and other common notions studied in First Philosophy can be applied in the eight books of *Natural Hearing* or in the three books *About the Soul.* But it also raises a question. If the more universal comes before the less universal in our knowledge as a rule, should not First Philosophy come before natural philosophy because the subject of the former is more universal than that of the latter? And Thomas seems to follow Avicenna in saying that being (which is most universal) is what our reason first understands.

However, we often overlook a distinction about the being first understood by our reason. Consider this text of Thomas:

> obiectum intellectus est commune quoddam, scilicet ens et verum, sub quo comprehenditur etiam ipse actus intelligendi. Unde intellectus potest suum actum intelligere.
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> Sed non primo, quia nec primum obiectum intellectus nostri, secundum praesentem statum, est quodlibet ens et verum;
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> sed ens et verum consideratum in rebus materialibus, ut dictum est;
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> ex quibus in cognitionem omnium aliorum devenit.[9]

Our reason's own object is the what it is of something sensed or imagined. And since we do not think without images, we are apt to think of what is as bodies and what is in bodies. Hence, as Aristotle notes in the fourth book of *Natural Hearing,* thinkers before him held the opinion that whatever is must be somewhere; and if it is not somewhere, it does not exist. But to be in place is a property of body. Likewise, they identified substance with the matter of bodies. So having no knowledge of anything immaterial and always thinking with images, our reason has in the beginning no reason to separate being from bodies or what is in place. Our reason has difficulty separating things it has never found separated. We can see also like this the great difficulty thinkers have had trying to separate the one which is convertible with being from the one which is the beginning of number. All of this shows the great difficulty of rising to the most universal (being and one) in separation from the continuous and bodies. It is only when the Greeks begin to reason from material and changing things to the

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[9] *Summa Theologiae*, Prima Pars, Q. 87, Art. 3, Ad 1

existence of something immaterial and unchanging that reason could begin to make this separation. But that reasoning, of course, presupposes what we learn in the eight books of *Natural Hearing* (and the three books *About the Soul*)

Moreover, First Philosophy is chiefly about substance and those things that have more being. But substance and the things that have more being are less known to us than the things that barely are or even are not. Thomas notes this and explains why it is so in the following text:

> accidentia et motus et privationes parum aut nihil habent de entitate; et tamen ista sunt magis nota quoad nos quam substantiae rerum, quia sunt viciniora sensui, cum per se cadant sub sensu quasi sensibilia propria vel communia. Formae substantiales per accidens.[10]

Since Aristotle is going to consider natural things and their causes in general and not descend to the particular in the eight books of *Natural Hearing,* someone might think that he is not going from the confused to the distinct in these books. But as we can see in his discourse on the confused and distinct, there are two movements of reason from the confused to the distinct. One might be called the *horizontal* movement which stays on the same level of universality as when its goes from a put together whole to its parts or from the knowledge to name something to the knowledge to define it, and the other is the *vertical* which descends from the more universal to the less universal. When Euclid moves from triangle to the definition of triangle, he is moving from the confused to the distinct in the horizontal direction, staying on the same level of universality. But when he descends from triangle to the kinds of triangle (such as equilateral, isosceles and scalene), he is proceeding from the confused to the distinct in the vertical direction. But given the two directions in which our reason can move from the confused to the distinct, in which direction should it moves first? Euclid moves from triangle to the definition of triangle before he descends to the particular kinds of triangle. Likewise, he moves from quadrilateral to its definition before he descends to the particular kinds of quadrilateral (square, oblong etc). And there is a reason for moving thus in the horizontal direction first. Unless we know distinctly that a triangle is a plane

[10] Thomas Aquinas, *In VII Metaphysicorum*, lectio II, n. 1304

figure contained by three straight lines, we cannot understand the basis for the division into equilateral, isosceles and scalene and the completeness of that division. Aristotle does the same in natural philosophy, moving first in the horizontal direction, getting a distinct knowledge of nature and natural things in general in the eight books of *Natural Hearing* and then moving vertically to the particulars in the later books of natural philosophy.

The order of consideration in natural philosophy seems to be the contrary of the order in wisdom or first philosophy. For in the latter, reason goes towards the immaterial and to some extent from the less universal to the more universal (thus we proceed from act and ability as found in motion and movable things to a completely universal consideration of them where they can be found even in immaterial things and we ascend from the one which is the beginning of number to the one which is convertible with being).

Aristotle *somewhat* goes twice in natural philosophy from the general to the particular and towards matter. When he goes from the eight books of *Natural Hearing* to the four books *About the Universe* to the two books *About Generation and Corruption*, he is clearly going from the general to the particular and towards matter. But likewise, as he goes from the three books *About the Soul* to the books following upon them, he is going towards matter and from the general to the particular. However, all these books about living bodies are more about growth and changes that are more particular than those considered in the previous books which is why we said *somewhat* at the beginning of this paragraph.

The reason for going twice from the general to the particular and twice towards matter is connected with the distinction between nature and the soul as causes which Aristotle brings out in the second book *About the Soul* (the *De anima*).

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