

STUDY MATERIALS: Logic

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Overview

Course Objectives

1) To grasp the fundamental character of Aristotelian logic so that we can understand references to it in philosophical and theological discussions; 2) to be able to perceive

the use of logical tools in Aristotle and St. Thomas so that we can read both with more understanding; 3) to begin to use the tools of logic to think, write, and teach more clearly.

Required Texts

This course does not require the purchase of any textbooks. All of the required readings are available on the course's web site. The readings from St. Thomas and Porphyry are not readily available in print, but the Aristotle readings are for the most part. Most of them can be found in either *The Basic Works of Aristotle*, edited by Richard McKeon, or *Aristotle, Selected Works*, translated by Hippocrates Apostle. Plato's *Meno* is also readily available in print, for example, in *Plato, Five Dialogues*, translated by G.M.A. Grube. (Note: I have occasionally altered the translation of the texts of Aristotle to bring out his meaning more clearly, but I have in the main followed the standard translation as given in McKeon's edition.)

Recommended Texts

For further help in working out the details of Aristotelian logic I can recommend either of two books: 1) *Logic: The Art of Defining and Reasoning*, by John A. Oesterle (a classic logic textbook still in print and available on Amazon); 2) or, *Logic, An Aristotelian Approach*, by Sr. Mary Michael Spangler (very good, more logic drills, but overall less highly recommended).

St. Thomas wrote commentaries on two books of the *Organon*, *On Interpretation* and *Posterior Analytics*. There are English translations of both works, but both may be out of print.

For a theoretical discussion of the nature of analogous naming, I recommend *Aquinas and Analogy* by Ralph McInerney.

Order of Study for Each Lesson

1. First read the assigned Reading.
2. Then view or listen to the taped lecture. An outline of each lecture is available on the web site.
3. Next read the Supplementary Text that accompanies each lecture. This contains important matters which did not fit into the lecture format.
4. Finally complete the exercises for that lesson.

Lesson 1: What is Logic?

Readings

The Proemium of St. Thomas to Aristotle's *Posterior Analytics*

Translated by Anthony Andres

1. As Aristotle says in the beginning of his *Metaphysics*, the family of men live by art and reasons. In this the Philosopher seems to touch on something that is man's own, something by which he differs from the rest of the animals. This is so because, while the other animals are driven to their actions by a certain natural instinct, man is directed in his actions by the judgement of reason. And so it is that the various arts serve to perfect human actions easily and in an orderly way. In fact we see that art is nothing but a sure, rational ordering of the way human actions arrive at their correct end through determinate means.

Reason not only can direct the actions of the lower parts, but it also directs its own actions, because it belongs to the understanding part to reflect upon itself. Indeed, the understanding understands itself, and in the same way reason can reason about itself. Therefore, if the arts of building and making, through which man can do such actions easily and in an orderly way, were discovered because reason reasoned about the actions of the hands, for the same reason there must be some art which directs the actions of reason itself. Through this, man proceeds in the actions of reason in an orderly manner, easily, and without error.

2. This art is Logic, that is, the rational science. This is not only rational because it accords with reason (this is common to all the arts), but also because it is about the actions of reason as about its own matter.

3. We see, therefore, that it is the art of arts, since it directs the actions of reason from which all of the arts come. Therefore we must take the parts of logic from the variety in the actions of reason.

4. Now there are three actions of reason. The first two belong to reason insofar as it is a kind of understanding.

One action of the understanding is the understanding of what is not complex and cannot be divided, which understanding conceives what a thing is. This operation is called by some the informing of the understanding, or imagining through understanding. The teaching which Aristotle gives in the book *Categories* is ordered to this operation of reason.

The second operation of the understanding is the composing and dividing of understanding, in which we first find the true and the false. The teaching which Aristotle gives in the book *On Interpretation (Peri Hermeneias)* aids this action of reason.

The third action of reason deals with what belongs only to reason, namely, discoursing from one thing into another, so that from what is known it comes to a knowledge of what was unknown. The rest of the books of Logic aid this action.

5. Notice that, in a certain way, the actions of reason are like the actions of nature. That is why art imitates nature as much as it can. Now we find three kinds of actions in nature. In certain things nature acts by necessity, that is, in such a way that she cannot fail. In other things nature works more frequently than not, although sometimes she falls short of her proper action. There must be two kinds of actions in the latter case: one which happens for the most part, as when a complete animal is born from the seed; the other, as when nature falls short of what is fitting, as when a monstrosity is born from the seed because of the corruption of some principle.

These three are also found in the actions of reason. One process of reason produces necessity, so that there is no possibility of falling short of the truth. We acquire the certainty of science in this process. There is another process of reason which concludes to the truth for the most part but not with necessity. The third process of reason is that in which reason falls short of the truth because of a failure to follow some principle in reasoning.

6. The part of Logic which aids the first process is called the Judging part because judgement has the certainty of science. Since we cannot have sure judgement of effects unless we resolve them into first principles, this part of logic is called *Analytic*, which means *resolving*. The certainty of judgment that we possess through resolving comes from either: the form of the syllogism alone, and the book *Prior Analytics*, which is about the syllogism considered simply, is ordered to this; or also from the matter, when essential and necessary propositions are taken, and the book *Posterior Analytics*, which is about the demonstrative syllogism, is ordered to this.

Another part of Logic, called the Discovering part, aids the second process of reason. It is called Discovering because discovery does not always possess certainty. Thus, in order to acquire certainty we need to make a judgement about what has been discovered. Now just as we notice a kind of gradation in natural things which act for the most part (since the stronger the natural power, the less often it fails to produce its effect), so also we find some gradation in the process of reason that is not entirely certain. The process of reason has that gradation insofar as it approaches more and less to perfect certainty.

Sometimes although such a process does not produce science, it does produce belief or opinion because of the probability of the propositions from which it proceeds. For reason inclines toward one side of a contradiction completely, although a fear of the other side remains. Topics or dialectics is ordered to this because the dialectical syllogism, which Aristotle discusses in the book *Topics*, proceeds from probable.

Sometimes it produces, not complete belief or opinion, but a kind of suspicion, since it does not incline entirely toward one side of a contradiction, although more into one side than the other. The *Rhetoric* is ordered to this.

Sometimes only an estimation inclines into one side of a contradiction. This happens because of some representation, of the kind in which some food might become abominable to a man if it was represented in the appearance of something abominable. The *Poetics* is ordered to this, since it is characteristic of the poet to lead us toward something virtuous through a decent representation.

All of these pertain to rational philosophy because it is characteristic of reason to lead from one thing into another.

The third part of logic, which is called sophistic and which Aristotle treats in the book *Sophistical Refutations*, aids the third process of reason.

Outline

I. Introduction

- A. Outline of this lesson
- B. Historical Survey of Logic

II. The Need for Logic

- A. Necessity for Art
 - 1. Contrast Instinct and Reason
 - 2. The Seeming Inferiority of Reason
 - a. The Answer: Art
 - b. The Example of Building: before the Art
 - c. The Discovery of the Art
 - 3. Summing up the Necessity of Art
- B. The Necessity for an Art of Logic
 - 1. Reasoning Is an Action
 - 2. Reasoning Reflects upon Itself
 - 3. The Benefits of Logic
 - 4. Sums up the Necessity of Logic

III. Parts and Order of the Art of Logic

- A. The Principle of Division: the Operations of the Intellect
- B. The Logic of the First Operation
 - 1. The Treatises of the First Part of Logic
- C. The Second Operation
 - 1. The Mode of the Second Operation
 - 2. The Second Operation: Its End
- D. The Third Operation

1. The Judging Part of Logic: Certainty
2. Discovering Logic
3. Sophistical Refutations

IV. Conclusion

Supplementary Text

Introduction

These are supplementary remarks for the course produced for the International Catholic University on the logic of Aristotle and St. Thomas. The course will have a total of twelve lessons. The first lesson is on the importance of a course in logic for the study of Thomistic philosophy and theology. It will give you the big picture, an overview of this course and of the whole of logic. But before I begin that task, I want to give a brief historical survey of the origin of Aristotelian logic.

We first find logical themes being discussed by the ancient philosophers Socrates and Plato. Socrates discusses definition and induction in particular, while Plato take up several logical topics in detailed fashion, most notably in the *Meno* and the *Republic*. But neither Socrates nor Plato has given us a complete treatise on logic. It took Plato's student Aristotle to systematize the study of logic. Aristotle wrote several treatises on the different parts of logic, and these are collected in what scholars call the *Organon* (a Greek word meaning tool). Aristotle's *Organon* was the basis of most logical studies for over 1500 years, and it has been the subject of numerous commentaries. St. Thomas' teacher, St. Albert the Great, writes commentaries on every single book of the *Organon*. Perhaps this is why St. Thomas himself, though clearly familiar with the entire *Organon*, wrote commentaries on only two treatises in it, the *Peri Hermeneias*, translated as *On Interpretation*, and the *Posterior Analytics*. What we are going to do in this lesson is to discuss the prologue St. Thomas wrote to his commentary on Aristotle's *Posterior Analytics*. We will discuss that now because it is not a prologue just for the *Posterior Analytics*, but for the whole of logic. Also, St. Thomas covers the two themes we intend to discuss in this class, the importance of the study of logic, and the outline of the whole of logic.

Instinct, Reason, and Art.

St. Thomas begins his prologue by talking about the importance of logic, and using a quotation from the *Metaphysics* of Aristotle. Aristotle writes: The human race lives by art and reason. To explain this quotation, St. Thomas draws a contrast between man and the other animals. Man lives by art and reason, while the other animals live by instinct. This is how St. Thomas puts it:

While the other animals are driven to their actions by a certain natural instinct, man is directed to his actions by the judgement of reason.

Let me give an example. A sheep sees a wolf: it does not reason to itself that the wolf is dangerous, and I should run away from dangerous things, therefore I should run away from the wolf. The sheep simply has an overwhelming feeling of fear which drives him to run away by instinct from the object of that fear. A man also has feelings of fear, but the difference is that man can overcome his fear by the direction of reason. A man might see the wolf, feel fear, but judge that at this time the wolf is not dangerous, or that it will be more dangerous to run than to face the wolf. Man ultimately directs his actions by reason, while the animals are driven to their actions by instinct.

At first, this seems to point to the superiority of man over the other animals. The problem is that bare reasoning is not as quick as instinct and is more prone to error. That is, a man asks himself whether he should run from the wolf, and by the time he is through deliberating, the wolf has eaten him. Or perhaps he has enough time, but his reasoning is mistaken. Reason, then, requires deliberation, takes time, and is more prone to mistakes than instinct. Thus, it might now seem that because man is directed in his actions by reason, he is inferior to the other animals.

What is the answer to this problem? St. Thomas puts it this way:

The various arts serve to perfect human actions so that they proceed easily, and in an orderly way.

To understand that sentence, we need to understand what St. Thomas means by art. He is not referring just to the fine arts, painting, sculpture, music, but to a general habit of being able to make things or to perform certain kinds of actions. For example, the ability the carpenter has to make a table or a chair is an art according to St. Thomas, and the ability that the builder has to build a house is another kind of art. St. Thomas is saying that art gives reason the kind of ability that the animals have through instinct. Art enables reason to direct human actions so that they proceed quickly, easily, and without errors. St. Thomas then defines art as follows:

Art is nothing but a sure and rational ordering of the way human actions arrive at their correct ends through determinate means.

St. Thomas uses the art of building as an example. Every man needs shelter. If we look at man before he had discovered the art of building, we can see him making a very simple and imperfect shelter, for example, a lean-to. He gathers materials he thinks might help, big leaves, vines, a few sticks, and ties them together. He lashes this to a large tree. When he uses the lean-to, he finds that it's better than no shelter at all, but that the roof leaks, it lets in drafts, and it tends to fall down. Here is the lesson: using reasoning alone, a man cannot make an adequate shelter. On the other hand, bees by instinct immediately make a very efficient shelter, their hive. Before an art is discovered, reason is in some sense inferior to instinct.

Because man has reason, however, he can reflect on how he built the lean-to. He can think about which materials and construction methods worked, and which did not. At the end of the process of reflection the man has begun to acquire the art of building. Next

time he builds, he will use only those materials and those methods which worked the first time. He will build a better lean-to, and he will build it more easily. As he progresses further in his actions of building, the art of building becomes more and more perfect and the shelters are more and more effective.

We can sum it up this way: because man has reason rather than instinct, initially his actions are very imperfect. But because he can use reason to reflect upon his actions, he can perfect the means he uses to accomplish his purposes, and that reflection results in the discovery and acquisition of the arts.

The Necessity of Logic

What we can see so far is that art in general is necessary, that men live by reason and by art. We now need to see why a particular art, the art of logic, is necessary. St. Thomas writes:

Reason can not only direct the lower powers of the soul, but reason can direct itself in its own action, because it belongs to the understanding part to reflect upon itself.

Two important points are made in that sentence, so let us take them one at a time.

First, *reasoning directs its own actions*. St. Thomas is pointing out that reasoning is not just something that directs other actions, reasoning is itself an action. Thinking and reflecting are also kinds of doing.

Second, unlike the powers of soul which we share with the other animals, *human reason can reflect upon itself*. A sheep sees a wolf, feels fear, and runs away. His power of sight sees the wolf, but it does not see the action of seeing. His appetites fear the wolf, but they don't fear the action of fearing. He runs, but running does not perceive the action of running. The actions of the sheep cannot reflect upon themselves. But reason, because it is a spiritual power, not only can perceive the other actions, it can reflect upon itself and perceive its own action. Reason can reason about the action of reasoning.

The consequence is that, just as reason can reflect upon the action of building to discover the art of building, so reason can reflect upon the action of reasoning to discover an art of reasoning. That art is logic.

Let us remember what an art does for us. Before man possessed the art of building, he could build, but only with great difficulty, in a haphazard way, and he produced an inferior product. After he discovered the art, he could build easily, in an orderly way, and without mistakes. The same is true about reasoning. Before man discovered logic, he could reason, but with great difficulty and many mistakes. After he discovers logic, the art of reasoning, he can reason with much greater ease and make many fewer mistakes. St. Thomas writes:

There must be some art which directs the actions of reason itself. Through this man can perform the actions of reason in an orderly way, with ease, and without error. This art is logic.

Now we have seen fairly clearly why logic is necessary. If we are going to study St. Thomas' philosophy and theology, we will have to reason about very difficult matters. Reasoning by itself is not easy, and so it needs an art so that it becomes easier. Moreover, reasoning is prone to error, and so it needs an art which will prevent these errors. That art is logic. If we want to proceed well in philosophy and theology, we absolutely need that art of logic to guide us.

The Parts of Logic

After St. Thomas explains why we need the art of logic, he goes on to discuss the parts of that art. In fact, two thirds of the prologue is concerned with the outline of logic, showing us the parts of logic and the order of those parts. Our next task, then is to go over the outline St. Thomas provides for us.

Logic is going to be divided into many parts. What principle divides logic into parts? St. Thomas says that, since logic is the art of reasoning, logic will map onto the various ways in which reason works. That is, there will be one part of logic for each different kind of action the human mind performs. So the first thing that St. Thomas does is outline what he calls the three operations of the human intellect.

The first operation of the human intellect is, as St. Thomas puts it, the understanding of what is simple and indivisible, which understanding conceives what a thing is. For example, if I am going to study the science of geometry, I need to know what a triangle is. The idea of a triangle, what a triangle is, is simple, simple in the sense that it does not combine a subject and a predicate. It is just a subject to be understood.

It might seem strange that we would need a part of logic devoted to understanding what is so simple, the bare idea of what something is, such as what a triangle is. But St. Thomas would respond that we begin with an indistinct understanding of what a triangle is, and that the idea of a triangle is perfected and made distinct when we find a definition of a triangle. In this case the definition is plane figure bounded by three straight lines. Now the definition is a complex phrase, but it does not combine a subject and predicate, it does not say A triangle is a plane figure bounded by three straight lines. It simply says plane figure bounded by three straight lines. Thus, this definition is still understood by the first operation of the intellect. We see, then, that even in the first operation reason makes a progress in knowledge, and thus it needs a part of logic which shows it how to make good definitions.

That part of logic is covered in two treatises, one written by Aristotle called the *Categories*, and the other written by Porphyry, a philosopher of the later ancient world, which is called the *Isogoge*, which is simple Greek for introduction. The *Isogoge* is meant to be an introduction to the *Categories* of Aristotle, although it is

also an important treatise in its own right. The *Isogoge*, though not by Aristotle himself, is often included in editions of his *Organon*.

The first operation of the mind was characterized by a kind of simplicity. The second operation, by contrast, is characterized by complexity, the combination or separation of subject and predicate in a statement. The second part of logic deals with the combination or separation of the simpler things understood by means of the first part of logic.

The goal of the second operation is also in contrast to that of the first. The first operation is merely trying to understand what something is, while the second is trying to understand what is true or false about that simple thing. Thus, when I say triangle, or even plane figure bounded by three straight lines, there is no judgement of truth and falsity involved. But if I were to say A triangle is a plane figure bounded by three straight lines, then I am making a judgement about the true and false. Thus, through the operation which combines or divides a subject and predicate to make a complete statement the mind comes to understand, not just what something is, but what is true or false. The second part of logic directs this operation of composing or dividing and Aristotle's *Peri Hermeneias*, or *On Interpretation*, is about this part of logic.

Then St. Thomas moves on to the third and final operation of the human mind. He calls this operation discursive reasoning. Discursive comes from the Latin which means running through. The third operation is called discursive because in it the human mind runs through from one truth into another. It runs through one thing it knows and comes to a knowledge of what it previously did not know. All the rest of the books of the *Organon* are devoted to directing this action of reason.

St. Thomas explains why Aristotle needs several books to cover this part of logic by comparing the operation of discursive reasoning with the works of nature. He writes:

The actions of reason are like the actions of nature. Now we find three kinds of actions in nature. In certain things nature acts by necessity, that is, in such a way that she cannot fail. In other things, nature works more frequently than not, though sometimes she falls short of her proper action. There are two kinds of actions in the latter case, one which happens for the most part, the other in which nature falls short of what is fitting.

Let us take some examples to understand what St. Thomas means. The sun never fails to rise in the morning and set in the evening. There seems to be no natural way that this process could be obstructed. Therefore, we say that the rising and setting of the sun happens by necessity. When animals begin the process of generation, the end result is usually the production of a complete animal of the same kind. Nature here usually performs her proper action, does what she is supposed to do. On rare occasions, however, because there is some genetic deficiency, a failure at the beginning of the process, nature falls short of her intended action, and produces a deformed animal. These are examples of St. Thomas' three natural processes.

Just as in nature there are three kinds of actions, so there are three kinds of actions in discursive reasoning. Some reasonings reach their intended result by necessity. That is, they never fail to reach the truth. Other reasonings achieve the truth for the most part, just as nature usually produces a complete animal. Sometimes, there is failure in reasoning, so that it comes to a false conclusion because there has been some failure in its beginning, as when nature produces a deformed animal. That is why there are going to be three parts to the third part of logic.

In the seventh lesson we will discuss the subdivisions of this part of logic in detail. For the moment, let us simply note the names of the treatises in which Aristotle discusses these parts of logic. The first part of the third part, called the judging part, is covered in two books, the *Prior Analytics* and the *Posterior Analytics*. The second, called the discovering part, is covered in three books, *Topics*, *Rhetoric*, and *Poetics*. The final part is covered in one book, called *Sophistical Refutations*.

Conclusion

St. Thomas has done a great job in explaining to us why logic is important, and in giving us an overview of the whole of logic. In the following three lessons we are going to get into logic itself, the logic of the first operation. The next class will be a discussion of the most important points in Porphyry's *Isogoge*. Then in the two succeeding classes we are going to discuss Aristotle's *Categories*.

Exercises

1. Write a 250 word essay which comments on the following statement: I do not need to study logic because I have a natural aptitude for metaphysics.

Lesson 2: The Universal and the Predicables

Readings

Meno

by Plato, translated by Benjamin Jowett

PERSONS OF THE DIALOGUE MENO; SOCRATES; A SLAVE OF MENO; ANYTUS

Meno. Can you tell me, Socrates, whether virtue is acquired by teaching or by practice; or if neither by teaching nor practice, then whether it comes to man by nature, or in what other way?

Socrates. O Meno, there was a time when the Thessalians were famous among the other Hellenes only for their riches and their riding; but now, if I am not mistaken, they are equally famous for their wisdom, especially at Larisa, which is the native city of your friend Aristippus. And this is Gorgias' doing; for when he came there, the flower of the Aleuadae, among them your admirer Aristippus, and the other chiefs of the Thessalians, fell in love with his wisdom. And he has taught you the habit of answering questions in a grand and bold style, which becomes those who know, and is the style in which he himself answers all comers; and any Hellene who likes may ask him anything. How different is our lot! my dear Meno. Here at Athens there is a dearth of the commodity, and all wisdom seems to have emigrated from us to you. I am certain that if you were to ask any Athenian whether virtue was natural or acquired, he would laugh in your face, and say: "Stranger, you have far too good an opinion of me, if you think that I can answer your question. For I literally do not know what virtue is, and much less whether it is acquired by teaching or not." And I myself, Meno, living as I do in this region of poverty, am as poor as the rest of the world; and I confess with shame that I know literally nothing about virtue; and when I do not know the "quid" of anything how can I know the "quale"? How, if I knew nothing at all of Meno, could I tell if he was fair, or the opposite of fair; rich and noble, or the reverse of rich and noble? Do you think that I could?

Men. No, Indeed. But are you in earnest, Socrates, in saying that you do not know what virtue is? And am I to carry back this report of you to Thessaly?

Soc. Not only that, my dear boy, but you may say further that I have never known of any one else who did, in my judgment.

Men. Then you have never met Gorgias when he was at Athens? Soc. Yes, I have.

Men. And did you not think that he knew?

Soc. I have not a good memory, Meno, and therefore I cannot now tell what I thought of him at the time. And I dare say that he did know, and that you know what he said: please, therefore, to remind me of what he said; or, if you would rather, tell me your own view; for I suspect that you and he think much alike.

Men. Very true.

Soc. Then as he is not here, never mind him, and do you tell me: By the gods, Meno, be generous, and tell me what you say that virtue is; for I shall be truly delighted to find that I have been mistaken, and that you and Gorgias do really have this knowledge; although I have been just saying that I have never found anybody who had.

Men. There will be no difficulty, Socrates, in answering your question. Let us take first the virtue of a man—he should know how to administer the state, and in the administration of it to benefit his friends and harm his enemies; and he must also be careful not to suffer harm himself. A woman's virtue, if you wish to know about that, may also be easily described: her duty is to order her house, and keep what is indoors, and

obey her husband. Every age, every condition of life, young or old, male or female, bond or free, has a different virtue: there are virtues numberless, and no lack of definitions of them; for virtue is relative to the actions and ages of each of us in all that we do. And the same may be said of vice, Socrates.

Soc. How fortunate I am, Meno! When I ask you for one virtue, you present me with a swarm of them, which are in your keeping. Suppose that I carry on the figure of the swarm, and ask of you, What is the nature of the bee? and you answer that there are many kinds of bees, and I reply: But do bees differ as bees, because there are many and different kinds of them; or are they not rather to be distinguished by some other quality, as for example beauty, size, or shape? How would you answer me?

Men. I should answer that bees do not differ from one another, as bees.

Soc. And if I went on to say: That is what I desire to know, Meno; tell me what is the quality in which they do not differ, but are all alike;-would you be able to answer?

Men. I should.

Soc. And so of the virtues, however many and different they may be, they have all a common nature which makes them virtues; and on this he who would answer the question, "What is virtue?" would do well to have his eye fixed: Do you understand?

Men. I am beginning to understand; but I do not as yet take hold of the question as I could wish.

Soc. When you say, Meno, that there is one virtue of a man, another of a woman, another of a child, and so on, does this apply only to virtue, or would you say the same of health, and size, and strength? Or is the nature of health always the same, whether in man or woman?

Men. I should say that health is the same, both in man and woman.

Soc. And is not this true of size and strength? If a woman is strong, she will be strong by reason of the same form and of the same strength subsisting in her which there is in the man. I mean to say that strength, as strength, whether of man or woman, is the same. Is there any difference?

Men. I think not.

Soc. And will not virtue, as virtue, be the same, whether in a child or in a grown-up person, in a woman or in a man?

Men. I cannot help feeling, Socrates, that this case is different from the others.

Soc. But why? Were you not saying that the virtue of a man was to order a state, and the virtue of a woman was to order a house?

Men. I did say so.

Soc. And can either house or state or anything be well ordered without temperance and without justice?

Men. Certainly not.

Soc. Then they who order a state or a house temperately or justly order them with temperance and justice?

Men. Certainly.

Soc. Then both men and women, if they are to be good men and women, must have the same virtues of temperance and justice?

Men. True.

Soc. And can either a young man or an elder one be good, if they are intemperate and unjust?

Men. They cannot.

Soc. They must be temperate and just?

Men. Yes.

Soc. Then all men are good in the same way, and by participation in the same virtues?

Men. Such is the inference.

Soc. And they surely would not have been good in the same way, unless their virtue had been the same?

Men. They would not.

Soc. Then now that the sameness of all virtue has been proven, try and remember what you and Gorgias say that virtue is.

Men. Will you have one definition of them all?

Soc. That is what I am seeking.

Men. If you want to have one definition of them all, I know not what to say, but that virtue is the power of governing mankind.

Soc. And does this definition of virtue include all virtue? Is virtue the same in a child and in a slave, Meno? Can the child govern his father, or the slave his master; and would he who governed be any longer a slave?

Men. I think not, Socrates.

Soc. No, indeed; there would be small reason in that. Yet once more, fair friend; according to you, virtue is "the power of governing"; but do you not add "justly and not unjustly"?

Men. Yes, Socrates; I agree there; for justice is virtue.

Soc. Would you say "virtue," Meno, or "a virtue"?

Men. What do you mean?

Soc. I mean as I might say about anything; that a round, for example, is "a figure" and not simply "figure," and I should adopt this mode of speaking, because there are other figures.

Men. Quite right; and that is just what I am saying about virtue-that there are other virtues as well as justice.

Soc. What are they? tell me the names of them, as I would tell you the names of the other figures if you asked me.

Men. Courage and temperance and wisdom and magnanimity are virtues; and there are many others.

Soc. Yes, Meno; and again we are in the same case: in searching after one virtue we have found many, though not in the same way as before; but we have been unable to find the common virtue which runs through them all.

Men. Why, Socrates, even now I am not able to follow you in the attempt to get at one common notion of virtue as of other things.

Soc. No wonder; but I will try to get nearer if I can, for you know that all things have a common notion. Suppose now that some one asked you the question which I asked before: Meno, he would say, what is figure? And if you answered "roundness," he would reply to you, in my way of speaking, by asking whether you would say that roundness is "figure" or "a figure"; and you would answer "a figure."

Men. Certainly.

Soc. And for this reason-that there are other figures?

Men. Yes.

Soc. And if he proceeded to ask, What other figures are there? you would have told him.

Men. I should.

Soc. And if he similarly asked what colour is, and you answered whiteness, and the questioner rejoined, Would you say that whiteness is colour or a colour? you would reply, A colour, because there are other colours as well.

Men. I should.

Soc. And if he had said, Tell me what they are?-you would have told him of other colours which are colours just as much as whiteness.

Men. Yes.

Soc. And suppose that he were to pursue the matter in my way, he would say: Ever and anon we are landed in particulars, but this is not what I want; tell me then, since you call them by a common name, and say that they are all figures, even when opposed to one another, what is that common nature which you designate as figure-which contains straight as well as round, and is no more one than the other-that would be your mode of speaking?

Men. Yes.

Soc. And in speaking thus, you do not mean to say that the round is round any more than straight, or the straight any more straight than round?

Men. Certainly not.

Soc. You only assert that the round figure is not more a figure than the straight, or the straight than the round?

Men. Very true.

Soc. To what then do we give the name of figure? Try and answer. Suppose that when a person asked you this question either about figure or colour, you were to reply, Man, I do not understand what you want, or know what you are saying; he would look rather astonished and say: Do you not understand that I am looking for the "simile in multis"? And then he might put the question in another form: Mono, he might say, what is that "simile in multis" which you call figure, and which includes not only round and straight figures, but all? Could you not answer that question, Meno? I wish that you would try; the attempt will be good practice with a view to the answer about virtue.

Men. I would rather that you should answer, Socrates.

Soc. Shall I indulge you?

Men. By all means.

Soc. And then you will tell me about virtue?

Men. I will.

Soc. Then I must do my best, for there is a prize to be won.

Men. Certainly.

Soc. Well, I will try and explain to you what figure is. What do you say to this answer?- Figure is the only thing which always follows colour. Will you be satisfied with it, as I am sure that I should be, if you would let me have a similar definition of virtue?

.....

Men. Well then, Socrates, virtue, as I take it, is when he, who desires the honourable, is able to provide it for himself; so the poet says, and I say too-

Virtue is the desire of things honourable and the power of attaining them.

Soc. And does he who desires the honourable also desire the good?

Men. Certainly.

Soc. Then are there some who desire the evil and others who desire the good? Do not all men, my dear sir, desire good?

Men. I think not.

Soc. There are some who desire evil?

Men. Yes.

Soc. Do you mean that they think the evils which they desire, to be good; or do they know that they are evil and yet desire them?

Men. Both, I think.

Soc. And do you really imagine, Meno, that a man knows evils to be evils and desires them notwithstanding?

Men. Certainly I do.

Soc. And desire is of possession?

Men. Yes, of possession.

Soc. And does he think that the evils will do good to him who possesses them, or does he know that they will do him harm?

Men. There are some who think that the evils will do them good, and others who know that they will do them harm.

Soc. And, in your opinion, do those who think that they will do them good know that they are evils?

Men. Certainly not.

Soc. Is it not obvious that those who are ignorant of their nature do not desire them; but they desire what they suppose to be goods although they are really evils; and if they are mistaken and suppose the evils to be good they really desire goods?

Men. Yes, in that case.

Soc. Well, and do those who, as you say, desire evils, and think that evils are hurtful to the possessor of them, know that they will be hurt by them?

Men. They must know it.

Soc. And must they not suppose that those who are hurt are miserable in proportion to the hurt which is inflicted upon them?

Men. How can it be otherwise?

Soc. But are not the miserable ill-fated?

Men. Yes, indeed.

Soc. And does any one desire to be miserable and ill-fated?

Men. I should say not, Socrates.

Soc. But if there is no one who desires to be miserable, there is no one, Meno, who desires evil; for what is misery but the desire and possession of evil?

Men. That appears to be the truth, Socrates, and I admit that nobody desires evil.

Soc. And yet, were you not saying just now that virtue is the desire and power of attaining good?

Men. Yes, I did say so.

Soc. But if this be affirmed, then the desire of good is common to all, and one man is no better than another in that respect?

Men. True.

Soc. And if one man is not better than another in desiring good, he must be better in the power of attaining it?

Men. Exactly.

Soc. Then, according to your definition, virtue would appear to be the power of attaining good?

Men. I entirely approve, Socrates, of the manner in which you now view this matter.

Soc. Then let us see whether what you say is true from another point of view; for very likely you may be right:-You affirm virtue to be the power of attaining goods?

Men. Yes.

Soc. And the goods which mean are such as health and wealth and the possession of gold and silver, and having office and honour in the state-those are what you would call goods?

Men. Yes, I should include all those.

Soc. Then, according to Meno, who is the hereditary friend of the great king, virtue is the power of getting silver and gold; and would you add that they must be gained piously, justly, or do you deem this to be of no consequence? And is any mode of acquisition, even if unjust and dishonest, equally to be deemed virtue?

Men. Not virtue, Socrates, but vice.

Soc. Then justice or temperance or holiness, or some other part of virtue, as would appear, must accompany the acquisition, and without them the mere acquisition of good will not be virtue.

Men. Why, how can there be virtue without these?

Soc. And the non-acquisition of gold and silver in a dishonest manner for oneself or another, or in other words the want of them, may be equally virtue?

Men. True.

Soc. Then the acquisition of such goods is no more virtue than the non-acquisition and want of them, but whatever is accompanied by justice or honesty is virtue, and whatever is devoid of justice is vice.

Men. It cannot be otherwise, in my judgment.

Soc. And were we not saying just now that justice, temperance, and the like, were each of them a part of virtue?

Men. Yes.

Soc. And so, Meno, this is the way in which you mock me.

Men. Why do you say that, Socrates?

Soc. Why, because I asked you to deliver virtue into my hands whole and unbroken, and I gave you a pattern according to which you were to frame your answer; and you have forgotten already, and tell me that virtue is the power of attaining good justly, or with justice; and justice you acknowledge to be a part of virtue.

Men. Yes.

Soc. Then it follows from your own admissions, that virtue is doing what you do with a part of virtue; for justice and the like are said by you to be parts of virtue.

Men. What of that?

Soc. What of that! Why, did not I ask you to tell me the nature of virtue as a whole? And you are very far from telling me this; but declare every action to be virtue which is done with a part of virtue; as though you had told me and I must already know the whole of virtue, and this too when frittered away into little pieces. And, therefore, my dear I fear that I must begin again and repeat the same question: What is virtue? for otherwise, I can only say, that every action done with a part of virtue is virtue; what else is the meaning of saying that every action done with justice is virtue? Ought I not to ask the question over again; for can any one who does not know virtue know a part of virtue?

Men. No; I do not say that he can.

Soc. Do you remember how, in the example of figure, we rejected any answer given in terms which were as yet unexplained or unadmitted?

Men. Yes, Socrates; and we were quite right in doing so.

Soc. But then, my friend, do not suppose that we can explain to any one the nature of virtue as a whole through some unexplained portion of virtue, or anything at all in that fashion; we should only have to ask over again the old question, What is virtue? Am I not right?

Men. I believe that you are.

Soc. Then begin again, and answer me, What, according to you and your friend Gorgias, is the definition of virtue?

Men. O Socrates, I used to be told, before I knew you, that you were always doubting yourself and making others doubt; and now you are casting your spells over me, and I am simply getting bewitched and enchanted, and am at my wits' end. And if I may venture to make a jest upon you, you seem to me both in your appearance and in your power over others to be very like the flat torpedo fish, who torpifies those who come near him and touch him, as you have now torpified me, I think. For my soul and my tongue are really torpid, and I do not know how to answer you; and though I have been delivered of an infinite variety of speeches about virtue before now, and to many persons-and very good ones they were, as I thought-at this moment I cannot even say

what virtue is. And I think that. you are very wise in not voyaging and going away from home, for if you did in other places as do in Athens, you would be cast into prison as a magician.

Soc. You are a rogue, Meno, and had all but caught me.

Men. What do you mean, Socrates?

Soc. I can tell why you made a simile about me.

Men. Why?

Soc. In order that I might make another simile about you. For I know that all pretty young gentlemen like to have pretty similes made about them-as well they may-but I shall not return the compliment. As to my being a torpedo, if the torpedo is torpid as well as the cause of torpidity in others, then indeed I am a torpedo, but not otherwise; for I perplex others, not because I am clear, but because I am utterly perplexed myself. And now I know not what virtue is, and you seem to be in the same case, although you did once perhaps know before you touched me. However, I have no objection to join with you in the enquiry.

Men. And how will you enquire, Socrates, into that which you do not know? What will you put forth as the subject of enquiry? And if you find what you want, how will you ever know that this is the thing which you did not know?

Soc. I know, Meno, what you mean; but just see what a tiresome dispute you are introducing. You argue that man cannot enquire either about that which he knows, or about that which he does not know; for if he knows, he has no need to enquire; and if not, he cannot; for he does not know the, very subject about which he is to enquire.

Men. Well, Socrates, and is not the argument sound?

Soc. I think not.

The Isogoge of Porphyry (Chapters 1-6)

translated by Anthony Andres

Chapter One

Since it is necessary, Chrysaoros, both for the teaching on the Aristotelian Categories and for giving definitions, to know what genus, difference, species, property, accident are; and since knowledge of these wholly useful for those [sciences] which look to division and demonstration; therefore, in this short treatise I will try to discuss a few things, as the nature of an introduction demands, which were known by the ancient philosophers.

I will abstain from hidden questions, instead throwing myself more lightly into simpler matters: I will very much avoid whether genus and species exist in the nature of things, or have only been posited as bare notions of the mind; and, if they exist in the nature of things, whether they are bodies or non-bodily; and I excuse myself from saying whether they are separated, or existing in and around sensible things, since the treatment of such questions is most hidden and needs a greater inquiry at another time. Yet I will try to show you now that the ancients, especially the Peripatetics, discussed these and our other proposed topics in a way more fitting to Logic.

Chapter Two: About Genus

1. It seems that neither species nor genus are spoken of in just one way. Rather, a collection of some men, who were related to a certain man and in some way among themselves, was called a genus [race]. The genus Heraclidae was named a genus according to this meaning of the word because of the relation which a multitude has to this one man, Hercules, and to each other, since all born from his stock are in some way related. It was given this name to distinguish it from other genera.

2. Again, genus has another meaning. A principle from which one is born, either the man who begat one or the place where one was born, gives rise to a genus. Thus, we say that Orestes is from the genus of Tantalus, Hyllum from Hercules, but Pindar from the genus of Thebes, and Plato from Athens, since one's fatherland is a certain principle from which one arises, just as a father is. This meaning of the word is very clear. For the Heraclidae are named after Hercules, and the Cecropidae are those from Cecrope and the surrounding areas. And what is first called as genus is that principle from which one comes, then later the multitude of those who have arisen from the one principle. We name the whole multitude by the genus which defines it, dividing it from others, for example, the genus of Heraclidae.

3. In another way, that under which species is placed is the genus, perhaps through the example of those things so called. Such a genus is a certain principle of these things that are under it, and it also seems to contain a whole multitude which is under it.

4. Since therefore genus is spoken of in three separate ways, the philosophers use it in the third way. They also explain it through this description, saying that the genus is what is attributed to many differing in species in answer to the question "what is it?" just as animal is. For of those things which are attributed, some are predicated of one thing only as individual, just as "Socrates," and "this," and "that." Others are said of many, such as genus, species, difference, property, and accident, things said commonly and not just of one thing. Genus is something such as animal, species such as man, difference such as rational, property such as risible, accident such as white, blacking, sitting. Genus differs from those that are attributed to one only, since it is attributed to many. Genus differs from those that are attributed to many in the following ways: from species, even though species is also attributed to many, nevertheless it is not attributed to many differing in species, but only in number; for example, man, being a species, is attributed to Socrates and Plato, who do not differ from one another in species, but only

in number. Animal, however, since it is a genus, is attributed to man and cow and horse, which differ from one another not only in number, but in species.

Genus differs from property because property belongs to only one species, of which it is the property, and the individuals contained under that species. For example, risible is attributed only to man and particular men. A genus, however, is attributed not just to one, but to many different species. Genus truly differs from difference and common accident in that, even though these are also attributed to many different species, they are yet not attributed in answer to the question “what is it?” For if someone asks us, “what is that to which this is attributed?” we answer with the genus. We do not respond with a difference or an accident, since these are not attributed in answer to the question “what is it?” but rather in answer to the question “what kind of thing is it?” When someone asks “what kind of thing is man?” we answer “rational.” And when he asks: “what kind of thing is a raven?” we answer “black.” Rational is a difference, black an accident. But when we are asked what man is, we answer “animal” which is man’s genus. Genus then is distinguished from the individual by this, that the former is said of many, but the latter of merely one. It is distinguished from those which are attributed as species and property by this, that it is said of those differing in species. Finally, by this, that it is attributed in answer to the question “what is it?” it is separated from difference and common accident, which are attributed in answer “what kind of thing is it?” or “how is it affected?” for those things to which they are attributed. We have neither added nor omitted anything in the aforesaid description of the notion of genus.

Chapter Three: Of the Individual and the Species, Both Lowest and Subalternate

1. Each form is also called a species, and because of this meaning of the term it has been said, “Species is first indeed, and worthy to command.”
2. Each thing which is placed under some given genus is called a species. According to this meaning, we are accustomed to say that man is a species of animal, since animal is his genus. White also is a species of color, and triangle a species of figure.
3. Now we mention the species in explaining the genus, saying that it is attributed to many differing in species in answer to the question “what is it?” Similarly, we say that the species is placed under a given genus. We must realize that the genus is the genus of something, and the species is the species of something, and both of both. Therefore, it is necessary that use both in the definition of both.
4. They also explain species as follows: species is that which is collected under the genus; and, that to which genus is attributed in answer to the question “what is it?” Moreover, they also say that species is that which it attributed to many things differing in number in answer to the question “what is it?” - But this is really an explanation of the lowest species which is only a species and never a genus; the other explanations also belong to those which are not the lowest species.
5. In this way what we say will be made clear. In every category certain genera are highest, certain species are lowest, and between the highest genus and lowest species

are other which are called both genera and species. The highest genus is that above which there cannot be another genus. The lowest species are those below which there cannot be another species. Between the highest genus and lowest species are others which are both genera and species, as related to different things.

6. What we are saying is made manifest in one category. Substance is a genus; under it is body, and under body living body, under which is animal. Under animal is rational animal, under which is man; under man are Socrates, Plato, and other particular men. Among these, substance is the highest genus since it is only a genus, but man is the lowest species since it is only a species. Body, however, is both a species of substance and the genus of living body. Also, living body is a species of body, but the genus of animal. Again, animal is a species of living body, but the genus of rational animal, while rational animal is a species of animal, but the genus of man. Man, however, is still a species of rational animal, but it is not the genus of particular men, but is only their species. And whatever is placed before individuals and proximately attributed to them, is only a species, not a genus.

Just as substance, which is posited in the highest place, since there is no genus before it, is the highest genus; so also man who, though a species, has not other species posited after it and has nothing which enables it to be divided into species but only into individuals (for Socrates, Alcibiades, Plato, and this white thing are all called individuals), is only a species, and is the extreme species and (as we say) the lowest species. Those coming in the middle are before species, after genera.

These latter have two relations, one to what comes before, in relation to which they are called their species, the other to what comes after, in relation to which they are called their genera. The extremes of course have only one relation: for the highest genus has a relation to its inferiors, since it is the highest genus of all. But it does not have one with regard to superiors. For it is the highest and the first principle and, as we say, that above which there is no higher genus.

But also the lowest species have one relation toward what is prior, toward that of which it is a species. It does not have different relations by which it is referred to its inferiors, but it is called a species also with regard to the individuals. Indeed it is called the species of the individuals insofar as it contains them; but it is called the species of prior things because it is contained by them.

7. Therefore they define the highest genus as that which is a genus, but not a species; and again, that above which there cannot be another genus. They define the lowest species, however, thus: that which, while it is a species, is not a genus and which, while it is a species, cannot be divided into species. Again, they define it as that which is attributed to many differing in number in answer to the question "what is it?" The middles between the extremes they call subalternate species and genera, and each of them is posited to be both a genus and a species, although relating in one way to one, in another to another. For those which are before the lowest species in ascending to the highest genus are called subalternate genera and species. This is just as Agamemnon is from Atreus, who is from Pelops, who is from Tantalus, who is from Zeus.

8. In genealogies, the many are finally all referred to one beginning, for example, Zeus, but in genera and species this does not happen. For being is not the genus common to all things, neither are all things of the same kind by reason of some other supreme genus, but as Aristotle says in the *Categories*, there are ten first principles. For, he asks, if all things are called being, will the name have the same meaning, or not? Even if being is the common genus of all things, it will have different meanings, and so there will be ten first things, having a community in name only, but not in the definitions attributed to that name. Therefore, there are ten highest genera. Since there is some number of lowest species, they are not infinite. Yet the individuals which are after the lower species are infinite. Therefore, when we would descend from the highest genus to the lowest species, Plato commands us to stop and to descend through those which are in the middle by dividing through specific differences. The infinite, however must be left aside, since knowledge of them cannot be acquired. In descending to the lowest species therefore it is necessary to proceed by dividing a multitude, but in ascending it is necessary to collect the many into one. For species, even more than genus, has the power of collecting many into one. Against this are the singular and particular things, which divide the one into many. For many men by participation in the species are one man, but against them the particular and the singular are one, and the common is many because what is singular always has the power of dividing, while what is common has the power of collecting and uniting.

9. Since we have already explained what genus and species are, that genus is one, and species many (since the division of a genus is always into many species), genus is always attributed to species, and every superior to its inferiors. Species, however, is not attributed, either to the proximate or superior genera, since the relation is not reciprocated. For it is necessary either to attribute equals to equals, such as whinnying to the horse, or greater to lesser, such as animal to man, but never to attribute the lesser to the greater. For you would not be able to say that animals are men, as you are to say men are animals. To whatever the species is attributed, the genus is also attributed, and the genus of that genus, all the way to the highest genus. For if we say that Socrates is a man, and man is an animal, and animal a substance, then we can also truly say that Socrates is a substance. For the superior is always attributed to the inferior, and the species to the individual. The highest genus, however, is attributed to a genus or to genera if there are many middle and subalternate genera, and to the species, and to the individual. For the highest genus is predicated of every genus and species and individual standing under it, but the genus standing right before the lowest species is predicated only of that species and its individuals. That species, however, is only predicated of the individuals, while the individual is predicated of one singular only. Socrates is the individual, and also "this white thing" and "he who approaches" and "son of Sophroniscus," if Socrates is his only son.

10. Whatever things are like this are called individuals, since each consists of properties, the collection of which can never be found to be the same in some other thing. For the properties cannot be the same in some other particular. The properties of man in common are the same in many, but in all particular men insofar as they are men.

11. Therefore, the individual is contained by the species, the species by the genus. Furthermore, the genus is a certain whole, the individual a part, while the species is both a whole and a part. It is a part of one thing, but not the whole of the other thing, but a whole in other things, since the whole is in the parts. Therefore we have discussed the genus and species, what the highest genus and lowest species are, how genus and species are the same, that neither are individuals, and how many meanings of the terms there are.

Chapter Four: On Difference

1. Difference is spoken of commonly, properly, and most properly. One thing is said to differ from another commonly when by any diversity it stands apart in some way, either from itself or from another. For Socrates differs from Plato by some diversity, and he even differs from himself, since he once was a boy and then became a man, and since then he did something, but now keeps from doing something. It is always found in whatever diversity comes to be.

2. A thing is said to differ from another properly when it differs from another by an inseparable accident. Blue eyes, hooked noses, and scars (a scar is skin hardened from a wound) are all inseparable accidents.

3. Something is said to differ from another most properly when it stands apart by a specific difference. For example, man differs from the horse by a specific difference, that is, by the rational quality.

4. Universally therefore every difference added to something makes it various. That which is received commonly or properly makes something be diverse. That which is taken most properly makes it be another thing. And that which makes another thing is rightly called specific, while what makes it diverse is simply called a difference. For if the difference rational is added to animal, then it makes it be another thing and makes a species of animal. In contrast, the difference taken from motion makes something only diverse from the resting thing. This is because the first makes things be another thing, the second only makes things be diverse. And from those differences which make things another, divisions of genera into species are made, and also definitions are brought about, since definitions are constituted from genera and such differences. From those which make things in a way diverse, only diversities are made, and of that which is in some way affected, changes.

5. Again, let us repeat what we have said from its beginning. Some differences are separable. For example, to be moved, to rest, to be sick, to be well, and all the rest of the things of that genus are separable. However, to have a hooked nose or snub nose, having or being deprived of reason, are separable.

6. Of inseparable differences, some are attributed essentially, others accidentally. For rational, and mortal, and capable of learning inhere in man essentially. To have a hooked or snub nose, however, inheres in man accidentally, and not essentially. Therefore those which are present essentially are used in the definition and make

something another thing. Those which are accidentally, however, are neither used in the definition nor make something another thing, but only make it diverse. Those which are essential do not admit of being intensified or being diminished, while those which are accidental, even when they are inseparable, admit of being intensified and being diminished. Just as the genus is not attributed more or less to that of which it is the genus, so also the differences through which the genus is divided are not attributed more or less. These are the things which complete a definition, and the essence of each thing is one and the same, and does not admit of either being intensified or being diminished. To have a hooked or snub nose, however, or to be colored in some way, are intensified and diminished.

7. Therefore we have seen three species of difference, and some are separable, others inseparable; and of the inseparables some are essential, others accidental; again, of essential differences, some are used to divide genera into species, others are made by the species divided. For example, all of the following are essential differences of animal: animate and sensitive, rational and irrational, mortal and immortal. Animate and sensitive are the differences which constitute animal, since an animal is a animate sensitive substance. Mortal and immortal, and rational and irrational are differences dividing animal, since through them we divide the genera into species. But the differences which divide genera complete and constitute species. For animal is divided by these differences, by rational and irrational, then mortal and immortal. These differences, rational and mortal, constitute man, rational and immortal, a god, but irrational and mortal, brute animal. Thus, these differences also divide the highest genus, substance: animate and inanimate, sensitive and lacking sense. Animate and sensitive, when adjoined to substance, complete animal, while animate and lacking sense complete plant. Therefore, all of these are called specific, since taken one way they are constitutive, taken in another way they are dividing. Thus, these are most greatly used in the division of genera and in definitions, while accidental differences, even when they are inseparable, are not used, much less separable differences.

8. Those defining it also say that difference is that which species adds to the genus. For man adds rational and mortal to animal: since animal neither has none of these (otherwise how would the species come to have these differences) nor does it have all of these (since then the same thing would have opposites at the same time). Rather, as they say, it has all of the differences of the species made under itself, but only in potency, none of them in act. So it is neither the case that something comes from nothing, nor that opposites are in the same thing at the same time.

9. They also define it thus: difference is that which is attributed to many things differing in species in answer to the question “what kind of thing is it?” For when rational and mortal are attributed to man, they are said of him in answer to the question “what kind is man?” though not in answer to “what is man?” For to anyone asking what man is, we rightly respond “animal.” But to someone asking what kind of animal, we rightly respond: “rational and mortal.” For since things are made from matter and form, or from those things that correspond proportionally to matter and form, then just a statue is made from matter, bronze, and form, a shape, so also man both common and specific is made from

a genus, which corresponds to matter by proportion, and difference, which corresponds to form; but the whole here, rational mortal animal, is man, just as there it was with the statue.

10. They also describe it thus: difference is that which has a natural power of separating those which are collected under the same genus. For rational and irrational separate man and horse, which are under the same genus, namely animal.

11. They also explain it as follows: difference is that by which anything differs. For man and horse do not differ by reason of their genus, since both we and the horse are equally animals. But the addition of rational separates us from them. Again we are endowed with reason, as are the gods, but the addition of mortal distinguishes us from them.

12. Indeed, those who earnestly and carefully discuss difference do not say that difference is just anything which separates those under the same genus, but that it relates to the essence or whatness, and that it is part of the thing. For “apt by nature to sail” is not the difference of man, although it is proper to him. Of course, we could say that some animals are of a nature able to sail, and some are not, and thus separate man from other animals. But having a nature able to sail does not have the power of completing the essence, nor is it part of it, but is only an ability or aptitude of it. Thus, it is not such a difference as tells what kind of thing something is, and only these are called specific differences. Therefore, whatever makes another species and whatever inheres in the explicated quiddity of the thing is called a specific difference. Thus, we have spoken enough about difference.

Chapter Five: On Property

1. They divide the proper in three ways. For something is proper [one's own] if it belongs to only one species, even if not to all of it. Thus, to execute the duties of a healer or geometer belongs to man.

2. And that which belongs to all of a species, even if not to it alone, such as man being two-footed.

3. And that which happens to it only, and to all at some time, as men growing gray in old age.

4. And fourth, that in which all these things run together. To it alone, to all, and always; as man being able to laugh. For, even if he is not always laughing, he is still called able to laugh who, while not always laughing, is by nature able to laugh. This is always present in man by nature, just as neighing for the horse. And these are called proper since they are reciprocal. If something is a horse, it can neigh, and if it can neigh, it is a horse.

Chapter Six: On Accident

1. Accident is that which is present or absent without the destruction of the subject. It is divided into two kinds, for one is separable, and the other inseparable. For example, to sleep is a separable accident; to be black, however, so happens to the crow and Ethiopian that it is unable to be separated. But a white crow can be understood, and the Ethiopian can be understood leaving aside color, without the subject being destroyed.
2. They also define accident thus: accident is that which inheres or does not inhere contingently. Or they say that it is whatever is neither genus, nor difference, nor species, nor property, but always inheres in some subject.

Outline

- I. Introduction.
 - A. Order of the Second Lecture.
 - B. What the Logic of the First Operation is About.
- II. The Necessity of Definition
 - A. Difficulty: it seems that the first operation does not need logic.
 - B. Plato explains the need for a logic of the first operation.
 1. Progress from vague to distinct in the first operation.
 2. That process called definition.
 3. We look to Meno for lessons in defining.
 - a. Meno's first definition of virtue and its defect: no common nature.
 - b. Meno's second definition of virtue and its defect: does not apply to everything defined.
 - c. Meno's last definition and its defect: it applies to more than thing defined.
 - d. Summing up lessons learned from Meno.
- III. The Isogoge of Porphyry
 - A. Need for tools: comparison to building.
 - B. The predicables are ways of being universal, tools for definition.
 1. Universal: Definition and Examples.
 2. Plato on the Universal.
 3. Problem of the Universal in Porphyry.
 - C. Discussion of individual predicables.
 1. Three main predicables.
 - a. Genus.
 - (1) Genus: through etymology and comparison to family.
 - (2) Genus: strictly logical definition.
 - b. Species.
 - (1) Species: through etymology.
 - (2) Species: strictly logical definition.
 - (a) Both genus and species are concerned with what a thing is.
 - (3) Genus cannot be whole definition: it includes more than the species.

- c. Difference.
 - (1) Difference: through etymology.
 - (2) Strictly logical definition of difference and examples to illustrate it.
 - d. Summing up: how these three tools make good definitions. Every and no more.
 - (1) The Tree of Porphyry.
 - (a) Summa genera, intermediate genera, infima species.
 - (b) Tree of Porphyry itself.
 - 2. Property: basic account.
 - 3. Accident: basic account.
- IV. Conclusion: the need for more tools of definition.

Supplementary Text

Introduction

In our first lecture, we went over the importance of logic and we looked at the whole of logic. Logic was divided into three parts according to the three operations of the intellect, simple apprehension, composing and dividing, and discursive reasoning. In this lesson we will get into the details of the logic of the first operation. Our task today is to look at the *Isogoge* of Porphyry, which introduces to us the terms Aristotle uses in his *Categories*. Since Porphyry begins his introduction with the problem of the universal, our first task today is to look at that problem.

The Problem of the Universal

Let us begin by looking at what the term universal means. I can make the following statements: Fido is a dog, Spot is a dog, and Rover is a dog. Fido, Spot and Rover are different individuals, but I can say the same thing about each of them, that he is a dog. So the word dog, even though it is one word, can be said of, predicated of, many different individuals. I can say about many things that each is a dog. That is what we mean when we say that dog is a universal word. The universal is one thing predicated of many.

The universal immediately brings up a problem, perhaps the most important philosophical problem of early medieval philosophy. It asks, what does the universal word signify, what does it point to?

It was one of the first problems addressed by Plato, and he gives it the following solution. The universal, he says, signifies a Form which exists in another world, which the individuals in this world participate in. For example, if we take the universal term dog, Plato says that it actually points to a Form of dogness which exists in another world, the realm of Forms. The individual dogs, Fido, Spot and Rover, participate in that

Form of dogness, and are called dogs because of that participation. Plato makes the universal the most real kind of thing.

The medieval nominalists go to the opposite extreme in their solution of the problem. They said that the universal word was just a word, and nothing more, and that it points to nothing other than the individuals. The universal is just a way of collecting the individuals into a group or set. To use the same example, the nominalists denied that there was a Form of dogness, and that individuals participated in that Form. They said that only individuals dogs exist. The word dog was simply a convenient ways of collecting Fido, Spot, and Rover into a group.

Porphyry begins the *Isogoge* with this problem, and the many medieval commentaries on the *Isogoge* are often largely attempts to solve the problem. We will next look at Porphyry's careful formulation of the problem.

Porphyry writes:

I shall refuse to say whether genus and species [these are two kinds of universal] are subsistent or located only in naked concepts. And if subsistent, whether they are corporeal or incorporeal, and if incorporeal whether separate from sensible things or subsisting in them or around them. That business is very deep and requires a greater examination.

We can sum up Porphyry's presentation of the problem of universals as follows: 1) Are the universals real or imaginary? 2) If real, are they physical things or incorporeal things? 3) If they are incorporeal, do they exist separately from bodies, or do they exists in physical things?

Porphyry himself, quite rightly, refuses to solve the problem in his treatise, because he sees that the solution belongs to a higher science, namely, metaphysics. In fact, St. Thomas provides the solution to this problem in his metaphysical treatise, *On Being and Essence*. Still, a careful consideration of the problem even without the solution is useful in logic. Considering the problem helps us to know what we are talking about when we refer to universal words. The subject of the logic of the first operation is primarily concerned with the universal word and understanding what it means.

Need for a Logic of the First Operation

Now from what I have said so far it might seem unnecessary to have any logic for the first operation. After all, the problem of universals cannot be solved by the science of logic, and the simple apprehension of what something is, which is the action of the first operation, seems not to need any direction. We either know what something is, or we don't know it. If the first operation needs no direction from reason, then no part of logic will be concerned with it. Logic is just the art which directs the operations of reasoning.

There is a quote from Plato's *Meno* which explains why we need a logic for the first operation. Meno, immediately upon finding Socrates, confronts him with this difficult

question: Can you tell us, Socrates, Whether virtue is acquired by teaching or by practice, and if by neither, whether it comes to man by nature or in some other way? Socrates responds:

O Meno, I confess with shame that I know literally nothing about virtue, and when I do not know the what of anything, how can I know its properties? How could I tell, Meno, whether you were fair or the opposite of fair, rich and noble, or the reverse of rich and noble, if I did not know you?

This is the point that Plato makes in this passage. Meno wants to jump immediately to the question of whether virtue has certain attributes, characteristics, but Socrates replies that we must ask a previous question, what virtue is. If we do not know the answer to the question, 'What is it?' then we cannot know the answer to the question, 'What properties does it have?' What is clear is that Socrates is not merely ignorant of the meaning of the Greek word, *arete*, which we translate as *virtue*. Rather, he has only a vague idea of what virtue is, but before he assigns properties to virtue he needs a distinct idea of what virtue is.

Even in the first operation of the intellect there is a progress in knowledge, a progress in which we begin with a vague, an indistinct idea of what something is, and move towards a more distinct idea of what it is. That distinct idea is necessary for reasoning about the properties of the thing. We need a logic, therefore, which directs us so that we proceed correctly from the indistinct idea to the distinct idea.

The process of moving from the vague to the distinct knowledge of what a thing is is the process of defining. A definition is the way in which the first operation of reason is perfected, and so it is the fundamental concern of the first part of logic. Another way to understand the example is this: Meno asks whether virtue has a certain property, but Socrates responds by asking Meno for a definition of virtue.

Lessons on Definition

Meno is not daunted, and offers to give that definition, and his proposed definitions and Socrates' criticisms of them take up most of the first part of the *Meno*. What we are going to do now is to look at Meno's definitions and Socrates' criticisms in order to get our first understanding of the requirements of a good definition.

Meno first defines virtue as follows:

Let us take first the virtue of a man. He should know first how to administer the state and in the administration of it to benefit his friends and harm his enemies. The woman's virtue, if you wish to know about that, is also easily described. Her duty is to order and keep what is indoors, and to obey her husband. Every age, every position of life, young or old, slave or free, has a different virtue.

Socrates replies to this definition as follows:

How fortunate I am, Meno! I ask you for one virtue, and you give me a swarm of them. . . . But the virtues, no matter how many and how different they may be, have a common nature which makes them all virtues. Now this, he who would answer the question, what is virtue, would do well to have his eye fixed.

I think that we can take this lesson from Meno's first attempt to define virtue. Meno, when asked for a definition of virtue, begins to describe all the different kinds of virtue. But Socrates wants to know what all those different kinds of virtue have in common. When we are looking for a definition, we are looking for something common to all the things defined. We are looking for one nature.

Meno, finally understanding that lesson, proceeds to give a definition of virtue that is one. He says:

If you want to have one definition of them all, I know not what to say except that virtue is the power of governing mankind.

Meno has made progress. He gives a definition of virtue that does not split virtue into parts, but talks about the whole of it. Socrates points out, however, that this definition of virtue also does not work. He says:

Does this definition for virtue include all virtue? Is the virtue the same in the child and the slave, Meno? Can the child govern his father, or the slave his master?

We learn a second lesson about definition from Meno's second definition. A definition of a thing not only should not split the thing into parts, but it also must apply to all the parts, to every one of the things defined. As we saw before, the definition of virtue cannot simply be a list of the virtues of a man or a woman, the old or the young, the slave or the free, but neither can it leave any of these virtues out. It has to apply to the virtue of a man, of a woman, of the old and young, slave and free. Meno's does not, because it has to do with governing, and governing does not apply to the child or the slave.

Despite the fact that this definition for virtue does not work, Socrates lets it go by because he thinks that he can learn another lesson from it. He says to Meno:

You say that virtue is the power of governing. Should you not add, justly and not unjustly?

And Meno replies:

Yes, Socrates, I agree there, for justice is virtue.

And Socrates replies:

Is justice virtue, Meno, or a virtue?

Now Meno has committed another mistake with this definition. He still has one common definition, it is now the power of governing justly, but the problem is that justice is one of the parts that ought to be underneath virtue, justice is a virtue. Socrates points out that a good definition cannot put a part which falls under the whole into the definition of the whole. That would make the definition of the part circular. For example, if justice is a part of virtue, and it is also in the definition of virtue, when I try to define justice I will find that justice will fall into its own definition. But clearly, if a definition is trying to explain what something is, it cannot assume that you already know what it is.

Meno takes his last definition of virtue from a poet who says:

Virtue is the desire for good things, and the power of attaining them.

This definition avoids the pitfalls which wrecked the three previous definitions. It gives one nature, it applies to all of the things defined, and it does not include in the definition a part which fall under the whole. But Socrates still objects:

Do not all men, my dear sir, desire good things? . . . Then according to your definition, virtue would seem to be the power of attaining good. But is any mode of acquisition, even if unjust and dishonest, equally to be deemed virtue?

Socrates is showing us here that the poet's definition of virtue fails because it applies to men who are not virtuous. For example, the tyrant, like all men, desires the good things in life, and he also has the power of attaining them. Yet like Meno we would deny that the tyrant is virtuous. The definition of virtue must not only apply to all the things defined, but also only to them.

From all these examples we can gather a list of rules which every definition has to obey. First, every definition has to give a common nature, not simply a list of parts or kinds coming underneath the thing defined. Second, every definition must apply to every part under the thing defined. Third, the definition cannot include a part or kind which is underneath the thing defined. Such a definition would be circular. Finally, the definition has to exclude what is outside the thing defined. The definition includes everything in it, excludes everything outside of it.

The etymology of the word definition makes these points clear. Define comes from the Latin word *finis*, which means limit or boundary. The boundary of a field, for example, contains the whole field and excludes everything outside the field. In the same way, the definition is the boundary of a term: it includes everything which the term applies to, and excludes everything it does not apply to.

What Plato has done for us in the *Meno* is to sum up the rules of definition. He has given us some idea of how we go from a vague understanding of something to a distinct one. Yet it is one thing to state the rules, and another to obey them. How do we obey these rules, how do we find good definitions? In this and the two succeeding lessons we are going to acquire a set of tools which will help us make good definitions.

The Predicables

We can compare what we are going to do with the art of building. A builder may have the art of building, he may know how to make a good house, and he may have all the proper material and still be unable to make the house because he does not have the right tools. If he does not have a saw and hammer, the blueprints and lumber are useless. We are in the same position with regard to definition. We know now what a good definition is, what rules it must obey, but we still lack the tools which we must use to actually make the definition. These tools fall into two classes: the predicables, which are given to us in Porphyry's *Isogoge*, and the beginnings of all definitions, which are given in Aristotle's *Categories*. In the rest of today's lesson, we are going to return to the *Isogoge* and get the tools we need to make good definitions.

In the *Isogoge* Porphyry defines the five predicables. They are called the predicables because they are the different ways in which one term can be predicated of, said of, many things. Notice that we are not talking about actual predication here, which is discussed in the second part of logic, but the ability to be predicated. Since the universal is defined as what can be predicated of many things, we can say that the predicables are different ways of being universal.

There are five predicables: genus, species, difference, property, and accident. We are going to concentrate on the first three since they are most important for definition. We will discuss the last two more briefly.

Porphyry works up to his explanation of genus by looking at its etymology. The first meaning of genus is family or clan. The Kennedys would be a famous American clan, and many of them are called Kennedy because that was the name of their Patriarch, Joseph Kennedy. But certain universal terms are related to each other in the same way in which a member of a clan is related to its patriarch. For example, the terms dog, cat, and horse are all universal terms in their own right, but they all have one term predicated of them, animal. Just as John, Robert, and Edward are all Kennedys, so dog, cat, and horse are all animals. And since animal is like the clan or family that dogs, cats, and horses belong to, we can extend the meaning of the term genus and say that animal is the genus of dogs, cats, and horses.

Porphyry then gives the following strictly logical definition of the term genus:

A genus is that which is predicated in answer to "what is it?" of many differing in species; for example, animal of man and beast.

It is interesting that he has brought the word *species* into the definition of genus, before we know what species is. He does this because genus and species are correlative terms, and therefore must be defined in relation to each other. The next thing, then is to talk about the meaning of the term species.

Again Porphyry gives the etymology of the term. The English word comes straight from the Latin, but the Latin word species is related to *speculare*, which means to look. This,

the species is the look of the thing, its outward appearance. The Greek word *eidos* has a similar history. Thus, the first meaning that Porphyry assigns to the word species is visible form. Since we tend to divide things into kinds by their visible forms, species comes to mean a kind of thing. Thus, we say that dog, horse and cat are species of animals, meaning they are kinds of animals.

Porphyry then gives the following, strictly logical, definition:

Species is what is arranged under genus and of which genus is predicated in answer to "what is it?"

The explanations of both genus and species both refer to the question, 'What is it?' We have seen the question, 'What is it?' before because it is the question which asks for the definition of a thing. This is the case because the terms genus and species are closely related to definition. The genus answers the question 'What is it?' about the species, the species must have that question asked about itself, and the answer must include the genus. We can say this: the very nature of the genus/species relationship requires that the genus be in the definition for the species.

What role does the genus play in the definition? We saw that every definition must signify a common nature, some one thing which all the things defined have in common. The tool of genus assures that we have some one common nature. For example, the definition of the dog must point to one nature which all dogs have. But all dogs have the one nature of being animals. Therefore, the genus gives us that common nature.

But the genus cannot be the whole definition of the species. The genus includes what the species excludes. For example, the animal is related to dog as genus to species. The species dog excludes horses, but the genus animal does not, since every horse is also an animal. We saw before, however, that definitions must exclude everything outside what is being defined. Thus, the definition of the species must exclude everything outside the species: for example, the definition of the dog must exclude everything which is not a dog. Therefore, the definition of any species must include something more than the genus.

The other part of the definition of the species is called the difference. The word difference comes from two Latin words, *ferre* and *dis*, which combined mean carry away. A difference is what carries one thing away from another, and a specific difference is what carries one species under a genus away from the other species under that same genus. For example, men, dogs, and cats are all animals, but man is carried away from the other species under the genus animal by this difference: man is rational.

Thus, Porphyry gives the following definition of the specific difference:

Difference is predicated in answer to, 'Of what kind?' of those differing in species. Or, difference is what naturally separates those under a genus.

To take another example: living thing is a genus which has two species, plant and animal. The specific differences having sensation and lacking sensation are what divide that genus into its species. Thus, if someone asks what kind of living thing a plant is, the correct response gives the specific difference: a plant is a living thing lacking sensation. If someone asks what kind of animal man is, we say that man is a rational animal. Thus, the specific difference divides the genus and answers the question of what kind? of the species under that genus.

Now we have the first tools we need to build a good definition. A good definition, we saw before, must give a common nature, one thing that applies to everything defined, and must exclude those things not defined. The species is a common nature. The genus of that species includes everything that possesses that common nature. The difference excludes everything that does not possess that common nature. Thus, the definition of a species is made by combining a genus and a specific difference.

There is one more thing to say about genus and species. Porphyry writes:

The summum genus is that genus above which there is no higher genus. The infima species is that species below which there is no lower species. But between the summum genus and the infima species are others which may be taken as genera or species -- depending on how you look at it.

We compared the relations of genus and species to family relations, and Porphyry is describing a kind of family tree of genus and species. Since the relation of genus to species is like father to son, we put the genus above the species on a tree. But the genus itself has a common nature, and we might ask for its definition. Then we must find the genus of the original genus. Then the original genus becomes a species under a higher genus. When we get to the top of the tree, we find a genus which is just a genus, and is not a species. When we get to the bottom of the tree, we find a species which is just a species, and not a genus.

Chart 1

Chart 1 illustrates Porphyry's example. At the top of the tree is substance, which is a genus but not a species. Therefore, it is a summum (or highest) genus. It is divided into two species, body and spirit, by the differences taking up space and not taking up space. The species body is a genus to species underneath it, living thing and non-living thing. In this case, the differences are contained in the very names, living and non-living. Living thing is the genus of plant and animal, and the differences which divide it are having sensation and not having sensation. Finally, animal is a genus for man and beast, with the differences being rational and irrational. There are no species under man, merely individuals. Thus, man is an infima (or lowest) species. We can then give a fully spelled-out definition of man: man is a substance which takes up space, is living, sensitive, and rational.

We need to discuss briefly the last two predicables, property and accident. Neither of these will be used to form a definition, at least the strictest kind of definition, but the

distinction between them is important for understanding the third operation of the intellect. Property is from the Latin for one's own. Thus, the car that I buy and keep is my property, since it is mine and no one else's. Things that belong to others, like my neighbor's car, or things that are held in common, like the road which I drive on, are not my property. The word has the following meaning in logic: a property is an attribute which belongs only to a species, to all of that species, and all of the time. For example, the ability to laugh is a property of man: only man can laugh, every man can laugh, and every man retains the ability to laugh all the time. We can take another example from geometry: only triangles have angles that add up to 180 degrees, all triangles have that attribute, and have it all the time.

Finally, the predicable of accident includes any other way of being universally related to a subject. Since the genus, species, and difference are always essentially related to their subjects, they cannot fail to belong to them. Although property is not essential to its subject, it still belongs to it necessarily. An attribute is called an accident when it does not belong necessarily to its subject. This is indicated by the word itself, which comes from the Latin *accidere*, which means to happen. The accident is what happens to belong to the subject.

Conclusion

Genus, species, difference, property, and accident are the five predicables. The first three are great tools for definition, but they are not enough by themselves. The process of defining is complete only when we can spell out all the differences back to the highest genus. But we do not yet know what the highest genera are. Is there one highest genus, or are there many? What are the highest genera? Where do we find the differences that separate genera into species? How do we put the lower genera in their proper order? In the *Categories* Aristotle answers these questions. He determines that there is not one highest genus, but rather there are ten. He then gives us the tools for determining the specific differences. Finally, he will indicate how the intermediate genera should be ordered under the highest ones. We will discuss Aristotle's *Categories* in the next two lessons. Exercises

Exercises

1. Organize the following terms into a tree of genera and species:

triangle
 square
 rectangle
 curvilinear figure
 rectilinear figure
 geometrical figure
 isosceles triangle
 scalene triangle
 quadrilateral

2. Write definitions for each of the terms, except the term at the top of the tree.

3. Describe the relation that the predicate has to the subject.

For example: Man is an **animal**. GENUS

Triangles are **rectilinear figures**.

Triangles are **three-sided**.

Man is **rational**.

A tragedy is a **drama**.

A tragedy is **sad**.

Logic **directs reason**.

Logic is an **art**.

Socrates is a **man**.

Socrates is **tan**.

Some men are **tan**.

Lesson 3: The Categories

Readings

Categories (1-9)

by Aristotle, translated by E. M. Edghill

1.

Things are said to be named 'equivocally' when, though they have a common name, the definition corresponding with the name differs for each. Thus, a real man and a figure in a picture can both lay claim to the name 'animal'; yet these are equivocally so named, for, though they have a common name, the definition corresponding with the name differs for each. For should any one define in what sense each is an animal, his definition in the one case will be appropriate to that case only.

On the other hand, things are said to be named 'univocally' which have both the name and the definition answering to the name in common. A man and an ox are both 'animal', and these are univocally so named, inasmuch as not only the name, but also the definition, is the same in both cases: for if a man should state in what sense each is an animal, the statement in the one case would be identical with that in the other.

Things are said to be named 'derivatively', which derive their name from some other name, but differ from it in termination. Thus the grammarian derives his name from the word 'grammar', and the courageous man from the word 'courage'.

2.

Forms of speech are either simple or composite. Examples of the latter are such expressions as 'the man runs', 'the man wins'; of the former 'man', 'ox', 'runs', 'wins'.

Of things themselves some are predicable of a subject, and are never present in a subject. Thus 'man' is predicable of the individual man, and is never present in a subject.

By being 'present in a subject' I do not mean present as parts are present in a whole, but being incapable of existence apart from the said subject.

Some things, again, are present in a subject, but are never predicable of a subject. For instance, a certain point of grammatical knowledge is present in the mind, but is not predicable of any subject; or again, a certain whiteness may be present in the body (for colour requires a material basis), yet it is never predicable of anything.

Other things, again, are both predicable of a subject and present in a subject. Thus while knowledge is present in the human mind, it is predicable of grammar.

There is, lastly, a class of things which are neither present in a subject nor predicable of a subject, such as the individual man or the individual horse. But, to speak more generally, that which is individual and has the character of a unit is never predicable of a subject. Yet in some cases there is nothing to prevent such being present in a subject. Thus a certain point of grammatical knowledge is present in a subject.

3.

When one thing is predicated of another, all that which is predicable of the predicate will be predicable also of the subject. Thus, 'man' is predicated of the individual man; but 'animal' is predicated of 'man'; it will, therefore, be predicable of the individual man also: for the individual man is both 'man' and 'animal'.

If genera are different and co-ordinate, their differentiae are themselves different in kind. Take as an instance the genus 'animal' and the genus 'knowledge'. 'With feet', 'two-footed', 'winged', 'aquatic', are differentiae of 'animal'; the species of knowledge are not distinguished by the same differentiae. One species of knowledge does not differ from another in being 'two-footed'. But where one genus is subordinate to another, there is nothing to prevent their having the same differentiae: for the greater class is predicated of the lesser, so that all the differentiae of the predicate will be differentiae also of the subject.

4.

Expressions which are in no way composite signify substance, quantity, quality, relation, place, time, position, state, action, or affection. To sketch my meaning roughly, examples of substance are 'man' or 'the horse', of quantity, such terms as 'two cubits long' or 'three cubits long', of quality, such attributes as 'white', 'grammatical'. 'Double', 'half', 'greater', fall under the category of relation; 'in a the market place', 'in the Lyceum', under that of place; 'yesterday', 'last year', under that of time. 'Lying', 'sitting', are terms indicating position, 'shod', 'armed', state; 'to lance', 'to cauterize', action; 'to be lanced', 'to be cauterized', affection.

No one of these terms, in and by itself, involves an affirmation; it is by the combination of such terms that positive or negative statements arise. For every assertion must, as is admitted, be either true or false, whereas expressions which are not in any way composite such as 'man', 'white', 'runs', 'wins', cannot be either true or false.

5.

Substance, in the truest and primary and most definite sense of the word, is that which is neither predicable of a subject nor present in a subject; for instance, the individual man or horse. But in a secondary sense those things are called substances within which, as species, the primary substances are included; also those which, as genera, include the species. For instance, the individual man is included in the species 'man', and the genus to which the species belongs is 'animal'; these, therefore-that is to say, the species 'man' and the genus 'animal,-are termed secondary substances. It is plain from what has been said that both the name and the definition of the predicate must be predicable of the subject. For instance, 'man' is predicted of the individual man. Now in this case the name of the species 'man' is applied to the individual, for we use the term 'man' in describing the individual; and the definition of 'man' will also be predicated of the individual man, for the individual man is both man and animal. Thus, both the name and the definition of the species are predicable of the individual. With regard, on the other hand, to those things which are present in a subject, it is generally the case that neither their name nor their definition is predicable of that in which they are present. Though, however, the definition is never predicable, there is nothing in certain cases to prevent the name being used. For instance, 'white' being present in a body is predicated of that in which it is present, for a body is called white: the definition, however, of the colour 'white' is never predicable of the body.

Everything except primary substances is either predicable of a primary substance or present in a primary substance. This becomes evident by reference to particular instances which occur. 'Animal' is predicated of the species 'man', therefore of the individual man, for if there were no individual man of whom it could be predicated, it could not be predicated of the species 'man' at all. Again, colour is present in body, therefore in individual bodies, for if there were no individual body in which it was present, it could not be present in body at all. Thus everything except primary substances is either predicated of primary substances, or is present in them, and if these last did not exist, it would be impossible for anything else to exist.

Of secondary substances, the species is more truly substance than the genus, being more nearly related to primary substance. For if any one should render an account of what a primary substance is, he would render a more instructive account, and one more proper to the subject, by stating the species than by stating the genus. Thus, he would give a more instructive account of an individual man by stating that he was man than by stating that he was animal, for the former description is peculiar to the individual in a greater degree, while the latter is too general. Again, the man who gives an account of the nature of an individual tree will give a more instructive account by mentioning the species 'tree' than by mentioning the genus 'plant'.

Moreover, primary substances are most properly called substances in virtue of the fact that they are the entities which underlie every. else, and that everything else is either predicated of them or present in them. Now the same relation which subsists between primary substance and everything else subsists also between the species and the genus: for the species is to the genus as subject is to predicate, since the genus is predicated of the species, whereas the species cannot be predicated of the genus. Thus we have a second ground for asserting that the species is more truly substance than the genus. Of species themselves, except in the case of such as are genera, no one is more truly substance than another. We should not give a more appropriate account of the individual man by stating the species to which he belonged, than we should of an individual horse by adopting the same method of definition. In the same way, of primary substances, no one is more truly substance than another; an individual man is not more truly substance than an individual ox.

It is, then, with good reason that of all that remains, when we exclude primary substances, we concede to species and genera alone the name 'secondary substance', for these alone of all the predicates convey a knowledge of primary substance. For it is by stating the species or the genus that we appropriately define any individual man; and we shall make our definition more exact by stating the former than by stating the latter. All other things that we state, such as that he is white, that he runs, and so on, are irrelevant to the definition. Thus it is just that these alone, apart from primary substances, should be called substances.

Further, primary substances are most properly so called, because they underlie and are the subjects of everything else. Now the same relation that subsists between primary substance and everything else subsists also between the species and the genus to which the primary substance belongs, on the one hand, and every attribute which is not included within these, on the other. For these are the subjects of all such. If we call an individual man 'skilled in grammar', the predicate is applicable also to the species and to the genus to which he belongs. This law holds good in all cases.

It is a common characteristic of all substance that it is never present in a subject. For primary substance is neither present in a subject nor predicated of a subject; while, with regard to secondary substances, it is clear from the following arguments (apart from others) that they are not present in a subject. For 'man' is predicated of the individual man, but is not present in any subject: for manhood is not present in the individual man.

In the same way, 'animal' is also predicated of the individual man, but is not present in him. Again, when a thing is present in a subject, though the name may quite well be applied to that in which it is present, the definition cannot be applied. Yet of secondary substances, not only the name, but also the definition, applies to the subject: we should use both the definition of the species and that of the genus with reference to the individual man. Thus substance cannot be present in a subject.

Yet this is not peculiar to substance, for it is also the case that differentiae cannot be present in subjects. The characteristics 'terrestrial' and 'two-footed' are predicated of the species 'man', but not present in it. For they are not in man. Moreover, the definition of the differentia may be predicated of that of which the differentia itself is predicated. For instance, if the characteristic 'terrestrial' is predicated of the species 'man', the definition also of that characteristic may be used to form the predicate of the species 'man': for 'man' is terrestrial.

The fact that the parts of substances appear to be present in the whole, as in a subject, should not make us apprehensive lest we should have to admit that such parts are not substances: for in explaining the phrase 'being present in a subject', we stated that we meant 'otherwise than as parts in a whole'.

It is the mark of substances and of differentiae that, in all propositions of which they form the predicate, they are predicated univocally. For all such propositions have for their subject either the individual or the species. It is true that, inasmuch as primary substance is not predicable of anything, it can never form the predicate of any proposition. But of secondary substances, the species is predicated of the individual, the genus both of the species and of the individual. Similarly the differentiae are predicated of the species and of the individuals. Moreover, the definition of the species and that of the genus are applicable to the primary substance, and that of the genus to the species. For all that is predicated of the predicate will be predicated also of the subject. Similarly, the definition of the differentiae will be applicable to the species and to the individuals. But it was stated above that the word 'univocal' was applied to those things which had both name and definition in common. It is, therefore, established that in every proposition, of which either substance or a differentia forms the predicate, these are predicated univocally.

All substance appears to signify that which is individual. In the case of primary substance this is indisputably true, for the thing is a unit. In the case of secondary substances, when we speak, for instance, of 'man' or 'animal', our form of speech gives the impression that we are here also indicating that which is individual, but the impression is not strictly true; for a secondary substance is not an individual, but a class with a certain qualification; for it is not one and single as a primary substance is; the words 'man', 'animal', are predicable of more than one subject. Yet species and genus do not merely indicate quality, like the term 'white'; 'white' indicates quality and nothing further, but species and genus determine the quality with reference to a substance: they signify substance qualitatively differentiated. The determinate qualification covers a

larger field in the case of the genus than in that of the species: he who uses the word 'animal' is herein using a word of wider extension than he who uses the word 'man'.

Another mark of substance is that it has no contrary. What could be the contrary of any primary substance, such as the individual man or animal? It has none. Nor can the species or the genus have a contrary. Yet this characteristic is not peculiar to substance, but is true of many other things, such as quantity. There is nothing that forms the contrary of 'two cubits long' or of 'three cubits long', or of 'ten', or of any such term. A man may contend that 'much' is the contrary of 'little', or 'great' of 'small', but of definite quantitative terms no contrary exists.

Substance, again, does not appear to admit of variation of degree. I do not mean by this that one substance cannot be more or less truly substance than another, for it has already been stated that this is the case; but that no single substance admits of varying degrees within itself. For instance, one particular substance, 'man', cannot be more or less man either than himself at some other time or than some other man. One man cannot be more man than another, as that which is white may be more or less white than some other white object, or as that which is beautiful may be more or less beautiful than some other beautiful object. The same quality, moreover, is said to subsist in a thing in varying degrees at different times. A body, being white, is said to be whiter at one time than it was before, or, being warm, is said to be warmer or less warm than at some other time. But substance is not said to be more or less that which it is: a man is not more truly a man at one time than he was before, nor is anything, if it is substance, more or less what it is. Substance, then, does not admit of variation of degree.

The most distinctive mark of substance appears to be that, while remaining numerically one and the same, it is capable of admitting contrary qualities. From among things other than substance, we should find ourselves unable to bring forward any which possessed this mark. Thus, one and the same colour cannot be white and black. Nor can the same one action be good and bad: this law holds good with everything that is not substance. But one and the selfsame substance, while retaining its identity, is yet capable of admitting contrary qualities. The same individual person is at one time white, at another black, at one time warm, at another cold, at one time good, at another bad. This capacity is found nowhere else, though it might be maintained that a statement or opinion was an exception to the rule. The same statement, it is agreed, can be both true and false. For if the statement 'he is sitting' is true, yet, when the person in question has risen, the same statement will be false. The same applies to opinions. For if any one thinks truly that a person is sitting, yet, when that person has risen, this same opinion, if still held, will be false. Yet although this exception may be allowed, there is, nevertheless, a difference in the manner in which the thing takes place. It is by themselves changing that substances admit contrary qualities. It is thus that that which was hot becomes cold, for it has entered into a different state. Similarly that which was white becomes black, and that which was bad good, by a process of change; and in the same way in all other cases it is by changing that substances are capable of admitting contrary qualities. But statements and opinions themselves remain unaltered in all respects: it is by the alteration in the facts of the case that the contrary quality comes to

be theirs. The statement 'he is sitting' remains unaltered, but it is at one time true, at another false, according to circumstances. What has been said of statements applies also to opinions. Thus, in respect of the manner in which the thing takes place, it is the peculiar mark of substance that it should be capable of admitting contrary qualities; for it is by itself changing that it does so.

If, then, a man should make this exception and contend that statements and opinions are capable of admitting contrary qualities, his contention is unsound. For statements and opinions are said to have this capacity, not because they themselves undergo modification, but because this modification occurs in the case of something else. The truth or falsity of a statement depends on facts, and not on any power on the part of the statement itself of admitting contrary qualities. In short, there is nothing which can alter the nature of statements and opinions. As, then, no change takes place in themselves, these cannot be said to be capable of admitting contrary qualities.

But it is by reason of the modification which takes place within the substance itself that a substance is said to be capable of admitting contrary qualities; for a substance admits within itself either disease or health, whiteness or blackness. It is in this sense that it is said to be capable of admitting contrary qualities.

To sum up, it is a distinctive mark of substance, that, while remaining numerically one and the same, it is capable of admitting contrary qualities, the modification taking place through a change in the substance itself.

Let these remarks suffice on the subject of substance.

6.

Quantity is either discrete or continuous. Moreover, some quantities are such that each part of the whole has a relative position to the other parts: others have within them no such relation of part to part. Instances of discrete quantities are number and speech; of continuous, lines, surfaces, solids, and, besides these, time and place.

In the case of the parts of a number, there is no common boundary at which they join. For example: two fives make ten, but the two fives have no common boundary, but are separate; the parts three and seven also do not join at any boundary. Nor, to generalize, would it ever be possible in the case of number that there should be a common boundary among the parts; they are always separate. Number, therefore, is a discrete quantity.

The same is true of speech. That speech is a quantity is evident: for it is measured in long and short syllables. I mean here that speech which is vocal. Moreover, it is a discrete quantity for its parts have no common boundary. There is no common boundary at which the syllables join, but each is separate and distinct from the rest. A line, on the other hand, is a continuous quantity, for it is possible to find a common boundary at which its parts join. In the case of the line, this common boundary is the point; in the case of the plane, it is the line: for the parts of the plane have also a common boundary.

Similarly you can find a common boundary in the case of the parts of a solid, namely either a line or a plane. Space and time also belong to this class of quantities. Time, past, present, and future, forms a continuous whole. Space, likewise, is a continuous quantity; for the parts of a solid occupy a certain space, and these have a common boundary; it follows that the parts of space also, which are occupied by the parts of the solid, have the same common boundary as the parts of the solid. Thus, not only time, but space also, is a continuous quantity, for its parts have a common boundary.

Quantities consist either of parts which bear a relative position each to each, or of parts which do not. The parts of a line bear a relative position to each other, for each lies somewhere, and it would be possible to distinguish each, and to state the position of each on the plane and to explain to what sort of part among the rest each was contiguous. Similarly the parts of a plane have position, for it could similarly be stated what was the position of each and what sort of parts were contiguous. The same is true with regard to the solid and to space. But it would be impossible to show that the parts of a number had a relative position each to each, or a particular position, or to state what parts were contiguous. Nor could this be done in the case of time, for none of the parts of time has an abiding existence, and that which does not abide can hardly have position. It would be better to say that such parts had a relative order, in virtue of one being prior to another. Similarly with number: in counting, 'one' is prior to 'two', and 'two' to 'three', and thus the parts of number may be said to possess a relative order, though it would be impossible to discover any distinct position for each. This holds good also in the case of speech. None of its parts has an abiding existence: when once a syllable is pronounced, it is not possible to retain it, so that, naturally, as the parts do not abide, they cannot have position. Thus, some quantities consist of parts which have position, and some of those which have not. Strictly speaking, only the things which I have mentioned belong to the category of quantity: everything else that is called quantitative is a quantity in a secondary sense. It is because we have in mind some one of these quantities, properly so called, that we apply quantitative terms to other things. We speak of what is white as large, because the surface over which the white extends is large; we speak of an action or a process as lengthy, because the time covered is long; these things cannot in their own right claim the quantitative epithet. For instance, should any one explain how long an action was, his statement would be made in terms of the time taken, to the effect that it lasted a year, or something of that sort. In the same way, he would explain the size of a white object in terms of surface, for he would state the area which it covered. Thus the things already mentioned, and these alone, are in their intrinsic nature quantities; nothing else can claim the name in its own right, but, if at all, only in a secondary sense.

Quantities have no contraries. In the case of definite quantities this is obvious; thus, there is nothing that is the contrary of 'two cubits long' or of 'three cubits long', or of a surface, or of any such quantities. A man might, indeed, argue that 'much' was the contrary of 'little', and 'great' of 'small'. But these are not quantitative, but relative; things are not great or small absolutely, they are so called rather as the result of an act of comparison. For instance, a mountain is called small, a grain large, in virtue of the fact that the latter is greater than others of its kind, the former less. Thus there is a reference

here to an external standard, for if the terms 'great' and 'small' were used absolutely, a mountain would never be called small or a grain large. Again, we say that there are many people in a village, and few in Athens, although those in the city are many times as numerous as those in the village: or we say that a house has many in it, and a theatre few, though those in the theatre far outnumber those in the house. The terms 'two cubits long, 'three cubits long,' and so on indicate quantity, the terms 'great' and 'small' indicate relation, for they have reference to an external standard. It is, therefore, plain that these are to be classed as relative.

Again, whether we define them as quantitative or not, they have no contraries: for how can there be a contrary of an attribute which is not to be apprehended in or by itself, but only by reference to something external? Again, if 'great' and 'small' are contraries, it will come about that the same subject can admit contrary qualities at one and the same time, and that things will themselves be contrary to themselves. For it happens at times that the same thing is both small and great. For the same thing may be small in comparison with one thing, and great in comparison with another, so that the same thing comes to be both small and great at one and the same time, and is of such a nature as to admit contrary qualities at one and the same moment. Yet it was agreed, when substance was being discussed, that nothing admits contrary qualities at one and the same moment. For though substance is capable of admitting contrary qualities, yet no one is at the same time both sick and healthy, nothing is at the same time both white and black. Nor is there anything which is qualified in contrary ways at one and the same time.

Moreover, if these were contraries, they would themselves be contrary to themselves. For if 'great' is the contrary of 'small', and the same thing is both great and small at the same time, then 'small' or 'great' is the contrary of itself. But this is impossible. The term 'great', therefore, is not the contrary of the term 'small', nor 'much' of 'little'. And even though a man should call these terms not relative but quantitative, they would not have contraries.

It is in the case of space that quantity most plausibly appears to admit of a contrary. For men define the term 'above' as the contrary of 'below', when it is the region at the centre they mean by 'below'; and this is so, because nothing is farther from the extremities of the universe than the region at the centre. Indeed, it seems that in defining contraries of every kind men have recourse to a spatial metaphor, for they say that those things are contraries which, within the same class, are separated by the greatest possible distance.

Quantity does not, it appears, admit of variation of degree. One thing cannot be two cubits long in a greater degree than another. Similarly with regard to number: what is 'three' is not more truly three than what is 'five' is five; nor is one set of three more truly three than another set. Again, one period of time is not said to be more truly time than another. Nor is there any other kind of quantity, of all that have been mentioned, with regard to which variation of degree can be predicated. The category of quantity, therefore, does not admit of variation of degree.

The most distinctive mark of quantity is that equality and inequality are predicated of it. Each of the aforesaid quantities is said to be equal or unequal. For instance, one solid is said to be equal or unequal to another; number, too, and time can have these terms applied to them, indeed can all those kinds of quantity that have been mentioned.

That which is not a quantity can by no means, it would seem, be termed equal or unequal to anything else. One particular disposition or one particular quality, such as whiteness, is by no means compared with another in terms of equality and inequality but rather in terms of similarity. Thus it is the distinctive mark of quantity that it can be called equal and unequal.

7.

Those things are called relative, which, being either said to be of something else or related to something else, are explained by reference to that other thing. For instance, the word 'superior' is explained by reference to something else, for it is superiority over something else that is meant. Similarly, the expression 'double' has this external reference, for it is the double of something else that is meant. So it is with everything else of this kind. There are, moreover, other relatives, e.g. habit, disposition, perception, knowledge, and attitude. The significance of all these is explained by a reference to something else and in no other way. Thus, a habit is a habit of something, knowledge is knowledge of something, attitude is the attitude of something. So it is with all other relatives that have been mentioned. Those terms, then, are called relative, the nature of which is explained by reference to something else, the preposition 'of' or some other preposition being used to indicate the relation. Thus, one mountain is called great in comparison with son with another; for the mountain claims this attribute by comparison with something. Again, that which is called similar must be similar to something else, and all other such attributes have this external reference. It is to be noted that lying and standing and sitting are particular attitudes, but attitude is itself a relative term. To lie, to stand, to be seated, are not themselves attitudes, but take their name from the aforesaid attitudes.

It is possible for relatives to have contraries. Thus virtue has a contrary, vice, these both being relatives; knowledge, too, has a contrary, ignorance. But this is not the mark of all relatives; 'double' and 'triple' have no contrary, nor indeed has any such term. It also appears that relatives can admit of variation of degree. For 'like' and 'unlike', 'equal' and 'unequal', have the modifications 'more' and 'less' applied to them, and each of these is relative in character: for the terms 'like' and 'unequal' bear 'unequal' bear a reference to something external. Yet, again, it is not every relative term that admits of variation of degree. No term such as 'double' admits of this modification. All relatives have correlatives: by the term 'slave' we mean the slave of a master, by the term 'master', the master of a slave; by 'double', the double of its half; by 'half', the half of its double; by 'greater', greater than that which is less; by 'less,' less than that which is greater. So it is with every other relative term; but the case we use to express the correlation differs in some instances. Thus, by knowledge we mean knowledge the knowable; by the

knowable, that which is to be apprehended by knowledge; by perception, perception of the perceptible; by the perceptible, that which is apprehended by perception.

Sometimes, however, reciprocity of correlation does not appear to exist. This comes about when a blunder is made, and that to which the relative is related is not accurately stated. If a man states that a wing is necessarily relative to a bird, the connexion between these two will not be reciprocal, for it will not be possible to say that a bird is a bird by reason of its wings. The reason is that the original statement was inaccurate, for the wing is not said to be relative to the bird qua bird, since many creatures besides birds have wings, but qua winged creature. If, then, the statement is made accurate, the connexion will be reciprocal, for we can speak of a wing, having reference necessarily to a winged creature, and of a winged creature as being such because of its wings.

Occasionally, perhaps, it is necessary to coin words, if no word exists by which a correlation can adequately be explained. If we define a rudder as necessarily having reference to a boat, our definition will not be appropriate, for the rudder does not have this reference to a boat qua boat, as there are boats which have no rudders. Thus we cannot use the terms reciprocally, for the word 'boat' cannot be said to find its explanation in the word 'rudder'. As there is no existing word, our definition would perhaps be more accurate if we coined some word like 'ruddered' as the correlative of 'rudder'. If we express ourselves thus accurately, at any rate the terms are reciprocally connected, for the 'ruddered' thing is 'ruddered' in virtue of its rudder. So it is in all other cases. A head will be more accurately defined as the correlative of that which is 'headed', than as that of an animal, for the animal does not have a head qua animal, since many animals have no head. Thus we may perhaps most easily comprehend that to which a thing is related, when a name does not exist, if, from that which has a name, we derive a new name, and apply it to that with which the first is reciprocally connected, as in the aforesaid instances, when we derived the word 'winged' from 'wing' and from 'rudder'. All relatives, then, if properly defined, have a correlative. I add this condition because, if that to which they are related is stated as haphazard and not accurately, the two are not found to be interdependent. Let me state what I mean more clearly. Even in the case of acknowledged correlatives, and where names exist for each, there will be no interdependence if one of the two is denoted, not by that name which expresses the correlative notion, but by one of irrelevant significance. The term 'slave,' if defined as related, not to a master, but to a man, or a biped, or anything of that sort, is not reciprocally connected with that in relation to which it is defined, for the statement is not exact. Further, if one thing is said to be correlative with another, and the terminology used is correct, then, though all irrelevant attributes should be removed, and only that one attribute left in virtue of which it was correctly stated to be correlative with that other, the stated correlation will still exist. If the correlative of 'the slave' is said to be 'the master', then, though all irrelevant attributes of the said 'master', such as 'biped', 'receptive of knowledge', 'human', should be removed, and the attribute 'master' alone left, the stated correlation existing between him and the slave will remain the same, for it is of a master that a slave is said to be the slave. On the other hand, if, of two correlatives, one is not correctly termed, then, when all other attributes are removed and

that alone is left in virtue of which it was stated to be correlative, the stated correlation will be found to have disappeared.

For suppose the correlative of 'the slave' should be said to be 'the man', or the correlative of 'the wing' 'the bird'; if the attribute 'master' be withdrawn from 'the man', the correlation between 'the man' and 'the slave' will cease to exist, for if the man is not a master, the slave is not a slave. Similarly, if the attribute 'winged' be withdrawn from 'the bird', 'the wing' will no longer be relative; for if the so-called correlative is not winged, it follows that 'the wing' has no correlative.

Thus it is essential that the correlated terms should be exactly designated; if there is a name existing, the statement will be easy; if not, it is doubtless our duty to construct names. When the terminology is thus correct, it is evident that all correlatives are interdependent.

Correlatives are thought to come into existence simultaneously. This is for the most part true, as in the case of the double and the half. The existence of the half necessitates the existence of that of which it is a half. Similarly the existence of a master necessitates the existence of a slave, and that of a slave implies that of a master; these are merely instances of a general rule. Moreover, they cancel one another; for if there is no double it follows that there is no half, and vice versa; this rule also applies to all such correlatives. Yet it does not appear to be true in all cases that correlatives come into existence simultaneously. The object of knowledge would appear to exist before knowledge itself, for it is usually the case that we acquire knowledge of objects already existing; it would be difficult, if not impossible, to find a branch of knowledge the beginning of the existence of which was contemporaneous with that of its object.

Again, while the object of knowledge, if it ceases to exist, cancels at the same time the knowledge which was its correlative, the converse of this is not true. It is true that if the object of knowledge does not exist there can be no knowledge: for there will no longer be anything to know. Yet it is equally true that, if knowledge of a certain object does not exist, the object may nevertheless quite well exist. Thus, in the case of the squaring of the circle, if indeed that process is an object of knowledge, though it itself exists as an object of knowledge, yet the knowledge of it has not yet come into existence. Again, if all animals ceased to exist, there would be no knowledge, but there might yet be many objects of knowledge. This is likewise the case with regard to perception: for the object of perception is, it appears, prior to the act of perception. If the perceptible is annihilated, perception also will cease to exist; but the annihilation of perception does not cancel the existence of the perceptible. For perception implies a body perceived and a body in which perception takes place. Now if that which is perceptible is annihilated, it follows that the body is annihilated, for the body is a perceptible thing; and if the body does not exist, it follows that perception also ceases to exist. Thus the annihilation of the perceptible involves that of perception. But the annihilation of perception does not involve that of the perceptible. For if the animal is annihilated, it follows that perception also is annihilated, but perceptibles such as body, heat, sweetness, bitterness, and so on, will remain.

Again, perception is generated at the same time as the perceiving subject, for it comes into existence at the same time as the animal. But the perceptible surely exists before perception; for fire and water and such elements, out of which the animal is itself composed, exist before the animal is an animal at all, and before perception. Thus it would seem that the perceptible exists before perception. It may be questioned whether it is true that no substance is relative, as seems to be the case, or whether exception is to be made in the case of certain secondary substances. With regard to primary substances, it is quite true that there is no such possibility, for neither wholes nor parts of primary substances are relative. The individual man or ox is not defined with reference to something external. Similarly with the parts: a particular hand or head is not defined as a particular hand or head of a particular person, but as the hand or head of a particular person. It is true also, for the most part at least, in the case of secondary substances; the species 'man' and the species 'ox' are not defined with reference to anything outside themselves. Wood, again, is only relative in so far as it is some one's property, not in so far as it is wood. It is plain, then, that in the cases mentioned substance is not relative. But with regard to some secondary substances there is a difference of opinion; thus, such terms as 'head' and 'hand' are defined with reference to that of which the things indicated are a part, and so it comes about that these appear to have a relative character. Indeed, if our definition of that which is relative was complete, it is very difficult, if not impossible, to prove that no substance is relative. If, however, our definition was not complete, if those things only are properly called relative in the case of which relation to an external object is a necessary condition of existence, perhaps some explanation of the dilemma may be found. The former definition does indeed apply to all relatives, but the fact that a thing is explained with reference to something else does not make it essentially relative.

From this it is plain that, if a man definitely apprehends a relative thing, he will also definitely apprehend that to which it is relative. Indeed this is self-evident: for if a man knows that some particular thing is relative, assuming that we call that a relative in the case of which relation to something is a necessary condition of existence, he knows that also to which it is related. For if he does not know at all that to which it is related, he will not know whether or not it is relative. This is clear, moreover, in particular instances. If a man knows definitely that such and such a thing is 'double', he will also forthwith know definitely that of which it is the double. For if there is nothing definite of which he knows it to be the double, he does not know at all that it is double. Again, if he knows that a thing is more beautiful, it follows necessarily that he will forthwith definitely know that also than which it is more beautiful. He will not merely know indefinitely that it is more beautiful than something which is less beautiful, for this would be supposition, not knowledge. For if he does not know definitely that than which it is more beautiful, he can no longer claim to know definitely that it is more beautiful than something else which is less beautiful: for it might be that nothing was less beautiful. It is, therefore, evident that if a man apprehends some relative thing definitely, he necessarily knows that also definitely to which it is related.

Now the head, the hand, and such things are substances, and it is possible to know their essential character definitely, but it does not necessarily follow that we should

know that to which they are related. It is not possible to know forthwith whose head or hand is meant. Thus these are not relatives, and, this being the case, it would be true to say that no substance is relative in character. It is perhaps a difficult matter, in such cases, to make a positive statement without more exhaustive examination, but to have raised questions with regard to details is not without advantage.

8.

By 'quality' I mean that in virtue of which people are said to be such and such.

Quality is a term that is used in many senses. One sort of quality let us call 'habit' or 'disposition'. Habit differs from disposition in being more lasting and more firmly established. The various kinds of knowledge and of virtue are habits, for knowledge, even when acquired only in a moderate degree, is, it is agreed, abiding in its character and difficult to displace, unless some great mental upheaval takes place, through disease or any such cause. The virtues, also, such as justice, self-restraint, and so on, are not easily dislodged or dismissed, so as to give place to vice.

By a disposition, on the other hand, we mean a condition that is easily changed and quickly gives place to its opposite. Thus, heat, cold, disease, health, and so on are dispositions. For a man is disposed in one way or another with reference to these, but quickly changes, becoming cold instead of warm, ill instead of well. So it is with all other dispositions also, unless through lapse of time a disposition has itself become inveterate and almost impossible to dislodge: in which case we should perhaps go so far as to call it a habit.

It is evident that men incline to call those conditions habits which are of a more or less permanent type and difficult to displace; for those who are not retentive of knowledge, but volatile, are not said to have such and such a 'habit' as regards knowledge, yet they are disposed, we may say, either better or worse, towards knowledge. Thus habit differs from disposition in this, that while the latter is ephemeral, the former is permanent and difficult to alter. Habits are at the same time dispositions, but dispositions are not necessarily habits. For those who have some specific habit may be said also, in virtue of that habit, to be thus or thus disposed; but those who are disposed in some specific way have not in all cases the corresponding habit.

Another sort of quality is that in virtue of which, for example, we call men good boxers or runners, or healthy or sickly: in fact it includes all those terms which refer to inborn capacity or incapacity. Such things are not predicated of a person in virtue of his disposition, but in virtue of his inborn capacity or incapacity to do something with ease or to avoid defeat of any kind. Persons are called good boxers or good runners, not in virtue of such and such a disposition, but in virtue of an inborn capacity to accomplish something with ease. Men are called healthy in virtue of the inborn capacity of easy resistance to those unhealthy influences that may ordinarily arise; unhealthy, in virtue of the lack of this capacity. Similarly with regard to softness and hardness. Hardness is predicated of a thing because it has that capacity of resistance which enables it to

withstand disintegration; softness, again, is predicated of a thing by reason of the lack of that capacity.

A third class within this category is that of affective qualities and affections. Sweetness, bitterness, sourness, are examples of this sort of quality, together with all that is akin to these; heat, moreover, and cold, whiteness, and blackness are affective qualities. It is evident that these are qualities, for those things that possess them are themselves said to be such and such by reason of their presence. Honey is called sweet because it contains sweetness; the body is called white because it contains whiteness; and so in all other cases.

The term 'affective quality' is not used as indicating that those things which admit these qualities are affected in any way. Honey is not called sweet because it is affected in a specific way, nor is this what is meant in any other instance. Similarly heat and cold are called affective qualities, not because those things which admit them are affected. What is meant is that these said qualities are capable of producing an 'affection' in the way of perception. For sweetness has the power of affecting the sense of taste; heat, that of touch; and so it is with the rest of these qualities.

Whiteness and blackness, however, and the other colours, are not said to be affective qualities in this sense, but -because they themselves are the results of an affection. It is plain that many changes of colour take place because of affections. When a man is ashamed, he blushes; when he is afraid, he becomes pale, and so on. So true is this, that when a man is by nature liable to such affections, arising from some concomitance of elements in his constitution, it is a probable inference that he has the corresponding complexion of skin. For the same disposition of bodily elements, which in the former instance was momentarily present in the case of an access of shame, might be a result of a man's natural temperament, so as to produce the corresponding colouring also as a natural characteristic. All conditions, therefore, of this kind, if caused by certain permanent and lasting affections, are called affective qualities. For pallor and duskiness of complexion are called qualities, inasmuch as we are said to be such and such in virtue of them, not only if they originate in natural constitution, but also if they come about through long disease or sunburn, and are difficult to remove, or indeed remain throughout life. For in the same way we are said to be such and such because of these.

Those conditions, however, which arise from causes which may easily be rendered ineffective or speedily removed, are called, not qualities, but affections: for we are not said to be such virtue of them. The man who blushes through shame is not said to be a constitutional blusher, nor is the man who becomes pale through fear said to be constitutionally pale. He is said rather to have been affected.

Thus such conditions are called affections, not qualities. In like manner there are affective qualities and affections of the soul. That temper with which a man is born and which has its origin in certain deep-seated affections is called a quality. I mean such conditions as insanity, irascibility, and so on: for people are said to be mad or irascible in virtue of these. Similarly those abnormal psychic states which are not inborn, but arise from the concomitance of certain other elements, and are difficult to remove, or

altogether permanent, are called qualities, for in virtue of them men are said to be such and such.

Those, however, which arise from causes easily rendered ineffective are called affections, not qualities. Suppose that a man is irritable when vexed: he is not even spoken of as a bad-tempered man, when in such circumstances he loses his temper somewhat, but rather is said to be affected. Such conditions are therefore termed, not qualities, but affections.

The fourth sort of quality is figure and the shape that belongs to a thing; and besides this, straightness and curvedness and any other qualities of this type; each of these defines a thing as being such and such. Because it is triangular or quadrangular a thing is said to have a specific character, or again because it is straight or curved; in fact a thing's shape in every case gives rise to a qualification of it.

Rarity and density, roughness and smoothness, seem to be terms indicating quality: yet these, it would appear, really belong to a class different from that of quality. For it is rather a certain relative position of the parts composing the thing thus qualified which, it appears, is indicated by each of these terms. A thing is dense, owing to the fact that its parts are closely combined with one another; rare, because there are interstices between the parts; smooth, because its parts lie, so to speak, evenly; rough, because some parts project beyond others.

There may be other sorts of quality, but those that are most properly so called have, we may safely say, been enumerated. These, then, are qualities, and the things that take their name from them as derivatives, or are in some other way dependent on them, are said to be qualified in some specific way. In most, indeed in almost all cases, the name of that which is qualified is derived from that of the quality. Thus the terms 'whiteness', 'grammar', 'justice', give us the adjectives 'white', 'grammatical', 'just', and so on.

There are some cases, however, in which, as the quality under consideration has no name, it is impossible that those possessed of it should have a name that is derivative. For instance, the name given to the runner or boxer, who is so called in virtue of an inborn capacity, is not derived from that of any quality; for lo! those capacities have no name assigned to them. In this, the inborn capacity is distinct from the science, with reference to which men are called, e.g. boxers or wrestlers. Such a science is classed as a disposition; it has a name, and is called 'boxing' or 'wrestling' as the case may be, and the name given to those disposed in this way is derived from that of the science. Sometimes, even though a name exists for the quality, that which takes its character from the quality has a name that is not a derivative. For instance, the upright man takes his character from the possession of the quality of integrity, but the name given him is not derived from the word 'integrity'. Yet this does not occur often.

We may therefore state that those things are said to be possessed of some specific quality which have a name derived from that of the aforesaid quality, or which are in some other way dependent on it. One quality may be the contrary of another; thus justice is the contrary of injustice, whiteness of blackness, and so on. The things, also,

which are said to be such and such in virtue of these qualities, may be contrary the one to the other; for that which is unjust is contrary to that which is just, that which is white to that which is black. This, however, is not always the case. Red, yellow, and such colours, though qualities, have no contraries. If one of two contraries is a quality, the other will also be a quality. This will be evident from particular instances, if we apply the names used to denote the other categories; for instance, granted that justice is the contrary of injustice and justice is a quality, injustice will also be a quality: neither quantity, nor relation, nor place, nor indeed any other category but that of quality, will be applicable properly to injustice. So it is with all other contraries falling under the category of quality.

Qualities admit of variation of degree. Whiteness is predicated of one thing in a greater or less degree than of another. This is also the case with reference to justice. Moreover, one and the same thing may exhibit a quality in a greater degree than it did before: if a thing is white, it may become whiter.

Though this is generally the case, there are exceptions. For if we should say that justice admitted of variation of degree, difficulties might ensue, and this is true with regard to all those qualities which are dispositions. There are some, indeed, who dispute the possibility of variation here. They maintain that justice and health cannot very well admit of variation of degree themselves, but that people vary in the degree in which they possess these qualities, and that this is the case with grammatical learning and all those qualities which are classed as dispositions. However that may be, it is an incontrovertible fact that the things which in virtue of these qualities are said to be what they are vary in the degree in which they possess them; for one man is said to be better versed in grammar, or more healthy or just, than another, and so on. The qualities expressed by the terms 'triangular' and 'quadrangular' do not appear to admit of variation of degree, nor indeed do any that have to do with figure. For those things to which the definition of the triangle or circle is applicable are all equally triangular or circular. Those, on the other hand, to which the same definition is not applicable, cannot be said to differ from one another in degree; the square is no more a circle than the rectangle, for to neither is the definition of the circle appropriate. In short, if the definition of the term proposed is not applicable to both objects, they cannot be compared. Thus it is not all qualities which admit of variation of degree.

Whereas none of the characteristics I have mentioned are peculiar to quality, the fact that likeness and unlikeness can be predicated with reference to quality only, gives to that category its distinctive feature. One thing is like another only with reference to that in virtue of which it is such and such; thus this forms the peculiar mark of quality.

We must not be disturbed because it may be argued that, though proposing to discuss the category of quality, we have included in it many relative terms. We did say that habits and dispositions were relative. In practically all such cases the genus is relative, the individual not. Thus knowledge, as a genus, is explained by reference to something else, for we mean a knowledge of something. But particular branches of knowledge are not thus explained. The knowledge of grammar is not relative to anything external, nor

is the knowledge of music, but these, if relative at all, are relative only in virtue of their genera; thus grammar is said to be the knowledge of something, not the grammar of something; similarly music is the knowledge of something, not the music of something.

Thus individual branches of knowledge are not relative. And it is because we possess these individual branches of knowledge that we are said to be such and such. It is these that we actually possess: we are called experts because we possess knowledge in some particular branch. Those particular branches, therefore, of knowledge, in virtue of which we are sometimes said to be such and such, are themselves qualities, and are not relative. Further, if anything should happen to fall within both the category of quality and that of relation, there would be nothing extraordinary in classing it under both these heads.

9.

Action and affection both admit of contraries and also of variation of degree. Heating is the contrary of cooling, being heated of being cooled, being glad of being vexed. Thus they admit of contraries. They also admit of variation of degree: for it is possible to heat in a greater or less degree; also to be heated in a greater or less degree. Thus action and affection also admit of variation of degree. So much, then, is stated with regard to these categories.

We spoke, moreover, of the category of position when we were dealing with that of relation, and stated that such terms derived their names from those of the corresponding attitudes.

As for the rest, time, place, state, since they are easily intelligible, I say no more about them than was said at the beginning, that in the category of state are included such states as 'shod', 'armed', in that of place 'in the Lyceum' and so on, as was explained before.

Outline

I. Introduction:

- A. Two goals of the course: read and use Aristotle's logic.
- B. Tools of Building and Thinking.

II. Need for the Categories: finding highest genera and specific differences.

- A. Outline of parts of treatise covered in this lecture.
- B. Preliminary distinctions.
 - 1. The meaning of equivocal.
 - a. Meaning of Univocal.
 - 2. The simple and composite expression.
 - 3. Predicated of and Present in.

- a. The word Category: predicate.
- b. The word Category: accusation.
- 4. Sum up subject of treatise.
 - a. Treatise is about words used univocally.
 - b. Treatise is about simple expressions.
 - c. Treatise is about essential predicates.

III. Categories themselves

- A. There are ten highest genera.
- B. Substance.
 - 1. First sense of substance: ultimate subject of predication.
 - 2. Second sense of substance: species and genera of primary substances.
- C. Accidents.
 - 1. Basic notion of quantity.
 - a. Distinguish continuous and discrete.
 - 2. Relation implies reference to another.
 - a. Every relation has a correlative.
 - 3. General notion of Quality.
 - a. Quality admits of contraries and Varies in degree.

IV. Conclusion: we also need tools for difference.

Supplementary Text

Introduction

Since in this lesson we are beginning to read Aristotle himself, which is what we will do for the rest of the course, I thought that I would first outline the goals we have in going over Aristotle. The first goal is to make you able to read Aristotle's logic itself. I do not mean that you will be able to read it easily, since no one can read him easily. It always takes a great deal of effort and concentration to read Aristotle with understanding. And I do not say "understand him completely" because few do. Rather, our goal is to enable you to read Aristotle himself with some understanding, to at least give you a start at seeing what he is talking about. The second goal is to enable you to actually use Aristotle's logic. That is, use it in your own study, in your own process of learning.

Last time I talked about the predicables, and I made a comparison between them and the tools used for building. The predicables are some of the tools we need to build a good definition, just as the builder needs a hammer and saw to build a house. I want to keep using that idea of tool. We can say this: everything that we are studying in logic is a tool that the mind can use to come to understand things. They are tools we use to read philosophy and theology, to read Aristotle and St. Thomas with understanding, and to think about the subjects which they are writing about. And they are tools we can use to speak and write and teach in an orderly way.

St. Thomas is a good example. He constantly uses these tools. When he is reading Aristotle, that is, commenting on Aristotle's writings, he is constantly pointing to the logical structure of Aristotle's arguments. When he is teaching theology in his own right, he constantly uses these tools. The *Summa Theologiae* is filled with the use of logical tools. In the later exercises we will go back and look at passages from the *Summa* in which St. Thomas is using these tools. We can see that our knowledge of these tools is going to help us to understand what St. Thomas writes.

Distinctions at the Beginning of the *Categories*

Now let's get back to the *Categories* itself. Recall that in our last lecture we saw that the mind needs definitions: the first operation of the intellect moves from a vague to a distinct knowledge of what something is through making a definition. We also saw that we needed tools to make a definition, specifically the genus, species, and difference. Then we asked at the end of our last lecture how we would find these things, how do we find the genus and difference. The answers are given in the *Categories*. The main part of the *Categories* is concerned with finding genus, the latter part with finding specific differences. In today's lecture we will focus on the first part of the *Categories*, that concerned with genus. Our next lecture will take up the tools which help us find differences.

The tradition divides the *Categories* into three parts: the pre-categories, the categories themselves, and the post-categories. The pre-categories contains the distinctions we need to make before we can understand the categories themselves. That part is short, compared to the much longer discussion Aristotle undertakes of the categories themselves. In the post-categories Aristotle gives the tools which are concerned with difference. Notice that when Aristotle goes through the pre- and post-categories, he makes points which have an application beyond their use in the *Categories*. For example, in the post-categories he makes distinctions about order which go beyond the aims of simple definition. Since those kinds of distinctions are so universally important in the intellectual life, I will focus on them.

Aristotle makes three distinctions before he deals with the categories themselves, then he enunciates a law, and third he begins to discuss the categories. Let us first look at those three distinctions, followed by a brief comment on that law, and more extensive comments on each category.

The first distinction is between the univocal and equivocal use of a word. A first approach to this distinction is easy to make, but extremely important. Let us look at how Aristotle explains it:

Things are said to be named equivocally when, though they have a common name, the definition corresponding with the name is different for each.

Then Aristotle gives an example to explain what this means. He says that a man, such as Socrates, and a picture of a man in a painting can both be called "animal." That is, I can point at Socrates and truly and appropriately say, "that is an animal." I can point at

the picture of Socrates and say, "that is an animal." The same term, one name, animal, is used both times. The difference is that the meaning, the definition, of the term "animal" is different in the two cases. In the first, animal means "sensitive living thing." In the second, it means "image of a sensitive living thing." This is an equivocal use of a name.

The Aristotle goes on to explain the univocal use of a word:

On the other hand, things are said univocally which have both the name and the definition answering to the name in common.

We can use the example of man and cow. I can say with truth that man is an animal and that cows are animals. The term "animal" is the same name, it is used twice, and it has the same meaning in both cases: sensitive living thing. A man and a cow are both animals for the same reason.

This is not a hard distinction to make, but let us go on to the second distinction between the simple and composite. Here Aristotle does not give us a definition, but only examples:

Forms of speech are either simple or composite. Examples of the latter are such expressions as man runs, man wins, of the former, man, ox, runs, wins.

That is, "The man runs" is a composite expression, but its parts, "man" and "runs" are simple expressions. Aristotle will define more precisely the simple and composite later, but I want to say just one more thing about this distinction. Aristotle uses very neat words to express this distinction. What we have translated as "composite" literally means "interwoven," while what we translated as simple means "without interweaving." That is, sometimes when we use words, we weave them together with other words, while at other times we use them by themselves, without weaving them together with other words. This image of weaving words together will be very helpful for discussing the second and third operations of the intellect.

The third distinction is a distinction between things predicated of others and things present in other things. Before we explain this distinction, we should go back to explain the word "category." *Categories* is the name of the book, but it is in this context that Aristotle first uses that word. First we can say that "category" is just the Greek equivalent for the Latin-based word "predicate." Now the highest genera are rightly called categories because they are always predicates and never subjects. That is, a species is a subject which can have a definition predicated of it. That definition includes a genus and a difference. But that genus is usually itself a species, and it can have another genus predicated of it. Only when we get to the highest genera do we have a genus which has not other genus predicated of it: it is a predicate only, not a subject. Thus, the highest genera can be called predicates simply, or categories.

Another way to look at the word, perhaps more interesting, is to consider its etymology. The Greek word category has for its first meaning "accusation." It means "to speak

against in the public assembly." For example, publicly labeling someone a thief is accusing him, and in the Greek, categorizing him. So we can look at the highest genera as accusations against their subjects: man is "accused" of being a substance, color is "accused" of being a quality.

There are predicates, and there are things that, while not quite predicates, seem to function in much the same way. This is what Aristotle is trying to distinguish here. Let us look at an example. There are two English words that are closely related, brown and brownness. I can say, "The coat is brown," and I have predicated brown of coat. I cannot say, however, "The coat is brownness." That sentence does not seem even to make sense. I can, however, use the word "brownness" to say something similar: "The coat has, or possesses, brownness." This is the distinction Aristotle is pointing to when he distinguishes what is predicated of another from what is present in another. When we say that the subject is the other term, that other term is being predicated of the subject. When we say that the subject has the other term, that other term is present in the subject. In our example, "brown" is predicated of the coat, "brownness" is present in it.

These distinctions are at the beginning of the *Categories* because they enable us to narrow down what the book *Categories* is about. The book is about words, but what kind of words? Are they words that are used with many different meanings of their subjects, equivocally, or with the same meaning, univocally? Remember, the definition includes a genus because the genus guarantees that the definition points out one common nature. That does not happen if the genus is a word used equivocally. Since the categories are the ultimate, the highest genera, and they have to be predicated of their species according to the same meaning, the categories must be words used univocally. For example, animal is not a genus for man and the picture of an animal, even though both are called animal. I would make animal the genus for man and beast, because the word would have the same meaning in both cases. Because the categories is about the highest genera, it is about words used univocally of all the species under them.

Second, are the categories simple expressions, or complex expressions? If the highest genera were complex expressions, they would need to be explained by something prior because complexity always has a cause. The complex expression cannot be understood without accounting for its simple parts. For example, the expression "man runs" would have to be explained through an analysis of "man" and "runs." It could not be a highest genus. Thus, the categories are not going to be complex, but simple expressions.

Third, are the categories predicated of, or present in, the species? Clearly the categories must be predicated of the species. We say that the species is the genus, not has the genus. Animal is the genus of man, and we say that man is an animal, not that he has animal. Thus, the categories are going to be names that are simple, that are used univocally of the species below them, and that are predicated of them, not present in them. Thus, the three distinctions narrow down the subject of the book *Categories*.

Finally there is a law which Aristotle states:

When one thing is predicated of another, all that which is predicable of the predicate will also be predicable of the subject.

He does not argue for the law, he simply gives an example. If I say Socrates is a man, and man is an animal, then by this law it is clear that Socrates is also an animal. This law shows us that the ultimate genera are not just useful for defining the very general things that come right below them. They are useful for defining every single species down to the lowest. We have already seen an example of this law at work: we said in our discussion of the *Isogoge* that man is an animal, and that animal is a living thing. Thus, we also said that man was a living thing. If the process is carried out to its conclusion, we reach the highest genus of substance. Thus, we defined man as a substance with three dimensions, life, sensation, and reason. Without Aristotle's law, we could not fully spell out the definition of man like this.

The Categories Themselves

I have not by any means exhausted the contents of the pre-categories, but we have understood enough to move on to the categories themselves. We said this before: Aristotle does not think that there is one highest genus, but many. St. Thomas explains why, but we are not yet in a position to understand that account. Let us simply note that Aristotle assigns ten highest genera:

Expressions that are in no way composite signify substance, quantity, quality, relation, place, time, position, outfit, action, or being acted upon.

Then he gives example of each:

To sketch my meanings roughly, examples are man or horse, of quantity such terms as two cubits long or three cubits long, of quality such attributes as white, grammatical. Double, half, and greater falls under the category of relation; in the marketplace, in the Lyceum, under that of place; yesterday, last year under that of time. Lying, sitting are terms indicating position, shod and armed outfit, to lance, to cauterize action; to be lanced, to be cauterized being acted upon.

First Aristotle notes that all of these express the understanding of the first operation of the intellect, since none of them by themselves signify the true or the false.

Aristotle does not just give us a list of examples, but rather goes over some of the categories in detail. Six of them he talks about briefly, but he talks about four, substance, quantity, relation, and quality in detail. In the rest of this lecture I would like to go over these four important categories.

First, consider substance. It is a highest genus, so it has no definition in the strict sense, but Aristotle does more than give examples of it. He distinguishes two different ways in which the term is used. He uses the distinction between predicable of and present in a subject to make the distinction between the ways in which the term substance is used. In the first and strictest way in which the term is used, substance is that which is neither

predicable of nor present in a subject. For example, I do not say about anything else that it is Socrates. The most I can say is that Socrates is Socrates, or that man is Socrates, but that is not predicating Socrates of another thing, it is simply predicating Socrates of himself. Neither can I say about anything else that it has Socrates. I do not say that another has Socrates in the sense in which Socrates would be present in a subject as a characteristic of that subject. Now if we ask ourselves what logical role the term Socrates plays, since it is neither a predicate nor like a predicate, the answer is that Socrates is just a subject for predicates. That is what it means to be a substance in the first and strictest sense of that term. Substance is the ultimate subject of all predication.

This seems strange because we are looking for the categories, which are the highest genera, which are all predicates. Now we seem to be saying that substance is not a predicate at all. Aristotle's answer is that there is another sense of the term substance. We know that substance in the first sense has other things predicated of it. Some of them, such as tan or pale, do not answer the question "What is it?" about the substance, but other ones, such as "man" and "animal" do. Those predicates which answer the question "What is it?" about substance in the strictest sense are also called substance, though in a second way. Aristotle writes:

Substance in the truest and first and most definite sense of the word is that which is neither predicable of a subject nor present in a subject . . . But in a secondary sense those things are called substance within which, as species, the primary substances are included; also, those which as genera include the species.

For example, Socrates is substance in the first sense, since he is not present in nor predicated of anything. But when asked the question, "What is Socrates?" I answer by saying "Socrates is a man." Man is therefore also a substance, though in a secondary sense. When asked what a man is, I answer "animal." Thus, the genus of man, animal, is also a substance in a secondary sense.

We said before that there are other things predicated of the primary substances, such as tan or pale, which are not secondary substances because they do not answer the question "what is it?" about the primary substances. Nevertheless, the fact that such things can be predicated of substances points out another distinguishing feature of substance: while remaining numerically one and the same, it is capable of admitting contrary qualities. That is, only substances directly undergo change. The other categories determine the way in which substances change. For example, pale and tan belong to the category of quality. When Socrates undergoes the process of tanning, we say that he has changed: first he was pale, now he is tan. Paleness and tanness did not change, they are the qualities which Socrates loses and gains in order that he might change. The fact that substance is the direct subject of a change, that it goes from one contrary to another, is one of its distinguishing characteristics.

The Accidents

The category of substance includes only one kind of predicate, that which answers the question, "What is it?" about primary substances. But since primary substances are the ultimate subjects of all other predicates, we group the other nine categories under the heading of accident, defined as what happens to a substance. Since the different accidents "happen" to their substances in different ways, we cannot say that "accident is a category." It is rather a word used equivocally to point out a kind of likeness between the other nine categories.

The first accident Aristotle discusses in the *Categories* is quantity. We can describe quantity by saying that it answers the question "How much?" or "How many?" Aristotle does not distinguish different meanings of the term, as he did with substance. Rather, he first distinguishes the species that fall immediately under this genus. The two species of quantity are the discrete and the continuous.

We will leave aside the formal definitions of these and simply explain what the terms mean. Discrete quantity is that which cannot be infinitely divided. For example, whole numbers are discrete quantities because I can only divide them down to the number one: if I tried to divide the one, I would leave the realm of whole number. Continuous quantities are those which can be infinitely divided. For example, length is a continuous quantity since, no matter how much I divide a length, I can still divide the parts and I'll still have length. He gives other examples: time is a continuous quantity, the syllable is discrete quantity because they are called long and short.

What is common to all quantity and is a distinguishing characteristic of it is that I call quantities equal and unequal. For example, I can say that twelve inches equals a foot, five time five equals twenty-five. If I use the word "equal" outside the realm of quantity, if, for example, I say that all men are equal, I am using the term "equal" in an extended sense. In the strict sense, only quantities are equal to each other.

After quantity, Aristotle takes up the category of relation. A complete treatment would require the consideration of many subtle points, but we will consider the more obvious facts. First, the way we translate the name of this category can be deceptive: relation is a very abstract term, but the Greek term Aristotle uses is concrete: *pros ti*, which would translate literally as "to something." Things are called relative when they are named in relation to another. For example, superior is a relative term because we cannot just say that something is superior and be understood: we have to say that it is superior to something. And a quantity is not just half, it is half of another quantity. Thus, a term which is only properly used when there is a reference to another is said relatively.

Every relative term implies a reference to another, the correlative of the original term. The superior is superior to another, and that other is inferior to it. Superior and inferior are correlative terms. The half is half of another, which other is double of it, and so half and double are correlative terms. Every relative has a correlative.

But not every relative term is simply a relation. Some terms, while they are said relatively, fall primarily into some other genus. They belong to another category, but because they imply a relation they are often spoken of as if they were relations. For example, knowledge is actually in the category of quality, but it is said relatively: knowledge is knowledge of something, and that something is knowable through knowledge. Thus, relative terms are of two kinds: first, relations themselves; second, things that fall into other categories but imply a relation.

The next category Aristotle discusses in quality. Maybe the best way in English to explain the word is to say that it answers the question, "Is it such a thing?" or "What is the thing like?"

Aristotle points out four species of quality: disposition, capacity, sense qualities, and shape. By shape he means terms such as straight, curved, square or round. By sense qualities he is referring to the objects of the five senses, such as color, sound, temperature, etc. By capacity he is referring to abilities, talents. Some people have the quality of swiftness because they have the capacity to run quickly. Finally, dispositions differ from capacities because they imply, not just an ability to do something, but an inclination to do it. For example, virtue is a disposition because it implies an inclination to do good actions. Swiftness is a capacity because it only implies the ability to run fast: the swift man might be lazy and disinclined to use his ability.

Since the different is the opposite of the like, this category has the characteristic of admitting of contraries: many, though not all, qualities have a contrary. For example, black and white are contraries, hot and cold are contraries, fast and slow are contraries, virtue and vice are contraries. All of them are also qualities. Qualities also often vary in degree. For example, hot is the contrary of cold, but one thing can be hotter than another. Virtue and vice are contrary qualities, but one man can be more virtuous than another. This makes qualities unlike substances and quantities, which neither have contraries nor vary in degree. These marks are not unique to quality, since they are also found in actions.

We can easily note the distinguishing characteristic of this category. If the category of quality tells us what something is like, then things are said to be like each other because they have the same qualities. Coal is like tar because both are black, Socrates is like Cato because both are virtuous. Blackness and virtue are qualities. Whenever we use the term likeness in its strict sense, we are speaking about qualities.

Conclusion

Aristotle says little about the other categories. He notes that action and being acted upon have contraries and vary in degree, like qualities, but otherwise with the last six categories he is content to give examples. His account, however, has been an important tool in our quest for good definitions. We now know what the highest genera are, and thus where our search for definition comes to an end, or we might say, has its beginning. But the search for definitions requires more than the highest genera: it also

requires tools that will give us the specific differences completing our definitions. Those tools come in the post-categories, and we will discuss them in our next lecture.

Exercises

State whether the word in **bold** is used univocally or equivocally.

1. Man is an **animal**.
Dogs are **animals**.
2. The Los Angeles Dodgers are a baseball **club**.
A baseball bat is a kind of **club**.
3. Albert was in eighth **grade**.
Albert received good **grades** in school.
4. I bought a tent at the general **store**.
Kmart is a discount department **store**.
5. The music was coming from the stereo **speakers**.
Alan Keyes is an inspiring **speaker**.
6. He put a **bit** in the horse's mouth.
But he waited a **bit** before he tried to ride the horse.
7. Logic directs **reason** in its actions.
Reason always proceeds from the known to the unknown.
8. Fido is a **dog**.
Spot is a **dog**.
9. Metaphysics is a **science**.
Astronomy is a **science**.
10. The RNC is an **arm** of the Republican Party.
The wing is the **arm** of a bird.

Into which category does each of the following terms fall?

Socrates
man
horse
redness
virtue
half
eighty meters
giving
receiving

Lesson 4: Opposition and Order

Readings

Categories (10, 12)

by Aristotle, translated by E. M. Edghill

10.

The proposed categories have, then, been adequately dealt with. We must next explain the various senses in which the term 'opposite' is used. Things are said to be opposed in four senses: (i) as correlatives to one another, (ii) as contraries to one another, (iii) as privatives to positives, (iv) as affirmatives to negatives. Let me sketch my meaning in outline. An instance of the use of the word 'opposite' with reference to correlatives is afforded by the expressions 'double' and 'half'; with reference to contraries by 'bad' and 'good'. Opposites in the sense of 'privatives' and 'positives' are 'blindness' and 'sight'; in the sense of affirmatives and negatives, the propositions 'he sits', 'he does not sit'.

(i) Pairs of opposites which fall under the category of relation are explained by a reference of the one to the other, the reference being indicated by the preposition 'of' or by some other preposition. Thus, double is a relative term, for that which is double is explained as the double of something. Knowledge, again, is the opposite of the thing known, in the same sense; and the thing known also is explained by its relation to its opposite, knowledge. For the thing known is explained as that which is known by something, that is, by knowledge. Such things, then, as are opposite the one to the other in the sense of being correlatives are explained by a reference of the one to the other.

(ii) Pairs of opposites which are contraries are not in any way interdependent, but are contrary the one to the other. The good is not spoken of as the good of the bad, but as the contrary of the bad, nor is white spoken of as the white of the black, but as the contrary of the black. These two types of opposition are therefore distinct. Those contraries which are such that the subjects in which they are naturally present, or of which they are predicated, must necessarily contain either the one or the other of them, have no intermediate, but those in the case of which no such necessity obtains, always have an intermediate. Thus disease and health are naturally present in the body of an animal, and it is necessary that either the one or the other should be present in the body of an animal. Odd and even, again, are predicated of number, and it is necessary that the one or the other should be present in numbers. Now there is no intermediate between the terms of either of these two pairs. On the other hand, in those contraries

with regard to which no such necessity obtains, we find an intermediate. Blackness and whiteness are naturally present in the body, but it is not necessary that either the one or the other should be present in the body, inasmuch as it is not true to say that everybody must be white or black. Badness and goodness, again, are predicated of man, and of many other things, but it is not necessary that either the one quality or the other should be present in that of which they are predicated: it is not true to say that everything that may be good or bad must be either good or bad. These pairs of contraries have intermediates: the intermediates between white and black are grey, sallow, and all the other colours that come between; the intermediate between good and bad is that which is neither the one nor the other.

Some intermediate qualities have names, such as grey and sallow and all the other colours that come between white and black; in other cases, however, it is not easy to name the intermediate, but we must define it as that which is not either extreme, as in the case of that which is neither good nor bad, neither just nor unjust.

(iii) 'Privatives' and 'Positives' have reference to the same subject. Thus, sight and blindness have reference to the eye. It is a universal rule that each of a pair of opposites of this type has reference to that to which the particular 'positive' is natural. We say that that is capable of some particular faculty or possession has suffered privation when the faculty or possession in question is in no way present in that in which, and at the time at which, it should naturally be present. We do not call that toothless which has not teeth, or that blind which has not sight, but rather that which has not teeth or sight at the time when by nature it should. For there are some creatures which from birth are without sight, or without teeth, but these are not called toothless or blind.

To be without some faculty or to possess it is not the same as the corresponding 'privative' or 'positive'. 'Sight' is a 'positive', 'blindness' a 'privative', but 'to possess sight' is not equivalent to 'sight', 'to be blind' is not equivalent to 'blindness'. Blindness is a 'privative', to be blind is to be in a state of privation, but is not a 'privative'. Moreover, if 'blindness' were equivalent to 'being blind', both would be predicated of the same subject; but though a man is said to be blind, he is by no means said to be blindness.

To be in a state of 'possession' is, it appears, the opposite of being in a state of 'privation', just as 'positives' and 'privatives' themselves are opposite. There is the same type of antithesis in both cases; for just as blindness is opposed to sight, so is being blind opposed to having sight.

That which is affirmed or denied is not itself affirmation or denial. By 'affirmation' we mean an affirmative proposition, by 'denial' a negative. Now, those facts which form the matter of the affirmation or denial are not propositions; yet these two are said to be opposed in the same sense as the affirmation and denial, for in this case also the type of antithesis is the same. For as the affirmation is opposed to the denial, as in the two propositions 'he sits', 'he does not sit', so also the fact which constitutes the matter of the proposition in one case is opposed to that in the other, his sitting, that is to say, to his not sitting.

It is evident that 'positives' and 'privatives' are not opposed each to each in the same sense as relatives. The one is not explained by reference to the other; sight is not sight of blindness, nor is any other preposition used to indicate the relation. Similarly blindness is not said to be blindness of sight, but rather, privation of sight. Relatives, moreover, reciprocate; if blindness, therefore, were a relative, there would be a reciprocity of relation between it and that with which it was correlative. But this is not the case. Sight is not called the sight of blindness.

That those terms which fall under the heads of 'positives' and 'privatives' are not opposed each to each as contraries, either, is plain from the following facts: Of a pair of contraries such that they have no intermediate, one or the other must needs be present in the subject in which they naturally subsist, or of which they are predicated; for it is those, as we proved,' in the case of which this necessity obtains, that have no intermediate. Moreover, we cited health and disease, odd and even, as instances. But those contraries which have an intermediate are not subject to any such necessity. It is not necessary that every substance, receptive of such qualities, should be either black or white, cold or hot, for something intermediate between these contraries may very well be present in the subject. We proved, moreover, that those contraries have an intermediate in the case of which the said necessity does not obtain. Yet when one of the two contraries is a constitutive property of the subject, as it is a constitutive property of fire to be hot, of snow to be white, it is necessary determinately that one of the two contraries, not one or the other, should be present in the subject; for fire cannot be cold, or snow black. Thus, it is not the case here that one of the two must needs be present in every subject receptive of these qualities, but only in that subject of which the one forms a constitutive property. Moreover, in such cases it is one member of the pair determinately, and not either the one or the other, which must be present.

In the case of 'positives' and 'privatives', on the other hand, neither of the aforesaid statements holds good. For it is not necessary that a subject receptive of the qualities should always have either the one or the other; that which has not yet advanced to the state when sight is natural is not said either to be blind or to see. Thus 'positives' and 'privatives' do not belong to that class of contraries which consists of those which have no intermediate. On the other hand, they do not belong either to that class which consists of contraries which have an intermediate. For under certain conditions it is necessary that either the one or the other should form part of the constitution of every appropriate subject. For when a thing has reached the stage when it is by nature capable of sight, it will be said either to see or to be blind, and that in an indeterminate sense, signifying that the capacity may be either present or absent; for it is not necessary either that it should see or that it should be blind, but that it should be either in the one state or in the other. Yet in the case of those contraries which have an intermediate we found that it was never necessary that either the one or the other should be present in every appropriate subject, but only that in certain subjects one of the pair should be present, and that in a determinate sense. It is, therefore, plain that 'positives' and 'privatives' are not opposed each to each in either of the senses in which contraries are opposed.

Again, in the case of contraries, it is possible that there should be changes from either into the other, while the subject retains its identity, unless indeed one of the contraries is a constitutive property of that subject, as heat is of fire. For it is possible that that which is healthy should become diseased, that which is white, black, that which is cold, hot, that which is good, bad, that which is bad, good. The bad man, if he is being brought into a better way of life and thought, may make some advance, however slight, and if he should once improve, even ever so little, it is plain that he might change completely, or at any rate make very great progress; for a man becomes more and more easily moved to virtue, however small the improvement was at first. It is, therefore, natural to suppose that he will make yet greater progress than he has made in the past; and as this process goes on, it will change him completely and establish him in the contrary state, provided he is not hindered by lack of time. In the case of 'positives' and 'privatives', however, change in both directions is impossible. There may be a change from possession to privation, but not from privation to possession. The man who has become blind does not regain his sight; the man who has become bald does not regain his hair; the man who has lost his teeth does not grow his grow a new set.

(iv) Statements opposed as affirmation and negation belong manifestly to a class which is distinct, for in this case, and in this case only, it is necessary for the one opposite to be true and the other false.

Neither in the case of contraries, nor in the case of correlatives, nor in the case of 'positives' and 'privatives', is it necessary for one to be true and the other false. Health and disease are contraries: neither of them is true or false. 'Double' and 'half' are opposed to each other as correlatives: neither of them is true or false. The case is the same, of course, with regard to 'positives' and 'privatives' such as 'sight' and 'blindness'. In short, where there is no sort of combination of words, truth and falsity have no place, and all the opposites we have mentioned so far consist of simple words.

At the same time, when the words which enter into opposed statements are contraries, these, more than any other set of opposites, would seem to claim this characteristic. 'Socrates is ill' is the contrary of 'Socrates is well', but not even of such composite expressions is it true to say that one of the pair must always be true and the other false. For if Socrates exists, one will be true and the other false, but if he does not exist, both will be false; for neither 'Socrates is ill' nor 'Socrates is well' is true, if Socrates does not exist at all.

In the case of 'positives' and 'privatives', if the subject does not exist at all, neither proposition is true, but even if the subject exists, it is not always the fact that one is true and the other false. For 'Socrates has sight' is the opposite of 'Socrates is blind' in the sense of the word 'opposite' which applies to possession and privation. Now if Socrates exists, it is not necessary that one should be true and the other false, for when he is not yet able to acquire the power of vision, both are false, as also if Socrates is altogether non-existent.

But in the case of affirmation and negation, whether the subject exists or not, one is always false and the other true. For manifestly, if Socrates exists, one of the two

propositions 'Socrates is ill', 'Socrates is not ill', is true, and the other false. This is likewise the case if he does not exist; for if he does not exist, to say that he is ill is false, to say that he is not ill is true. Thus it is in the case of those opposites only, which are opposite in the sense in which the term is used with reference to affirmation and negation, that the rule holds good, that one of the pair must be true and the other false.

12.

There are four senses in which one thing can be said to be 'prior' to another. Primarily and most properly the term has reference to time: in this sense the word is used to indicate that one thing is older or more ancient than another, for the expressions 'older' and 'more ancient' imply greater length of time.

Secondly, one thing is said to be 'prior' to another when the sequence of their being cannot be reversed. In this sense 'one' is 'prior' to 'two'. For if 'two' exists, it follows directly that 'one' must exist, but if 'one' exists, it does not follow necessarily that 'two' exists: thus the sequence subsisting cannot be reversed. It is agreed, then, that when the sequence of two things cannot be reversed, then that one on which the other depends is called 'prior' to that other.

In the third place, the term 'prior' is used with reference to any order, as in the case of science and of oratory. For in sciences which use demonstration there is that which is prior and that which is posterior in order; in geometry, the elements are prior to the propositions; in reading and writing, the letters of the alphabet are prior to the syllables. Similarly, in the case of speeches, the exordium is prior in order to the narrative.

Besides these senses of the word, there is a fourth. That which is better and more honourable is said to have a natural priority. In common parlance men speak of those whom they honour and love as 'coming first' with them. This sense of the word is perhaps the most far-fetched.

Such, then, are the different senses in which the term 'prior' is used.

Yet it would seem that besides those mentioned there is yet another. For in those things, the being of each of which implies that of the other, that which is in any way the cause may reasonably be said to be by nature 'prior' to the effect. It is plain that there are instances of this. The fact of the being of a man carries with it the truth of the proposition that he is, and the implication is reciprocal: for if a man is, the proposition wherein we allege that he is true, and conversely, if the proposition wherein we allege that he is true, then he is. The true proposition, however, is in no way the cause of the being of the man, but the fact of the man's being does seem somehow to be the cause of the truth of the proposition, for the truth or falsity of the proposition depends on the fact of the man's being or not being.

Thus the word 'prior' may be used in five senses.

Outline

I. Introduction.

- A. Problem left over: specific differences.
- B. Solution: opposites and order.

II. Opposites.

- A. Opposites are tools for specific difference.
 - 1. Must not overlap.
 - 2. Exhaustive.
 - 3. Opposites can fulfill the characteristics.
- B. Kinds of opposites.
 - 1. Correlatives.
 - a. Correlatives are not useful for specific differences: overlap.
 - 2. Contraries: most different in a genus.
 - a. Contraries are not specific differences: not exhaustive.
 - b. Two meanings of the term contrary.
 - 3. Privation and possession: lack and having in same subject.
 - a. Privation and Possession good candidates for specific differences.
 - (1) Exhaustive.
 - (2) Non-overlapping.
 - 4. Contradictories: having and lacking like statements.
 - a. Compare and contrast privation and possession to contradictories.
 - b. Contradictories are not differences: go beyond the genus.
 - c. Contradictories foundation for the previous two kinds of opposites.
- C. Opposites used for distinction and order.

III. Order is relation of prior and posterior, which have four meanings.

- A. Prior in time is easy.
- B. Prior in Being more difficult.
- C. Prior in knowledge.
 - 1. How it is like prior in being.
 - 2. How it is unlike prior in being.
- D. Prior in goodness. Priorities in moral life.
- E. Importance of order to philosophy in general and definition in particular.

IV. Conclusion: Analogy and second operation next.

Supplementary Text

Introduction

In this fourth lesson we are going to finish our discussion of the logic of the first operation. Let us just recall some basic points. The logic of the first operation aims at

understanding what something is, and the means to this is the definition of the thing. But we saw that we need tools to construct a good definition. In the second lesson we discussed the most basic tools, the predicables, especially genus, species, and difference. In the third lesson, we looked at the categories, the highest genera. In this lesson we will cover a tool that relates to specific difference, opposition, and one that helps us put a whole tree together, the tool of order.

The Kinds of Opposition

First, we need to see why opposites are tools for specific difference. Recall the function of the specific difference in the definition. Every definition must include all of the species, but only that species. The genus makes sure that every member of the species is included, and the specific difference makes sure nothing outside the species is included. That is, the specific difference must exclude every member of the other species under the genus. For example, if "rational" is the specific difference of man, it must exclude every beast from the species man. Otherwise, it would not be "defining," drawing a border, between the species man and everything else in the genus.

The sum of the specific differences under a genus, however, must include everything that is included under the genus. Consequently, the specific differences must exhaust the genus and must ensure that the species under the genus do not overlap. For example, the genus animal has two basic species, man and beast, with two specific differences, rational and irrational. These two differences exhaust the genus, because every animal is either rational or irrational, and they prevent overlap between the species, because no animal is both rational and irrational. We could not use brown and four-legged as the specific differences under animal, first because some animals are neither brown nor four-legged, and so the genus is not exhausted, and second because some animals are both brown and four legged, so that the species would overlap. The specific differences must exhaust the genus without allowing species to overlap.

If we ask what kinds of terms are related to each other in such a way that no two species can possess both, yet both together exhaust the genus of those species, Aristotle answers that such terms are called opposites. He takes up this topic in chapter 10 of the *Categories*. But before he determines exactly what kinds of opposites will work, and how they work, Aristotle gives a general account of opposition and its kinds.

Aristotle identifies four kinds of opposites, and then gives examples of each. Opposites are either correlatives, or contraries, or privatives and positives (also called privation and possession), or the affirmed and the denied (also called contradictory terms). He gives the following examples of each:

An instance of the use of the word "opposite" with reference to correlatives is afforded by the expressions "double" and "half;" with reference to contraries by "bad" and "good." Opposites in the sense of privatives and positives are "blindness" and "sight;" in the sense of affirmatives and negatives, the statements "he sits," "he does not sit."

He then goes on to discuss each kind of opposition in detail. The first kind he defines are the correlatives, which we briefly considered in our discussion of relation. There we found that every relative term implies another relative term that works in the opposite direction. For example, the term "double" implies the correlative "half." Thus, four is the double of two because two is half of four. The two relations together are called correlatives and they constitute a kind of opposition. "Double" and "half" and "parent" and "offspring" are pairs of correlative opposites.

While the opposition between correlatives is important in theology, and we are not wasting our time talking about it, it is not going to be useful for specific differences. An example will explain this. The number four is double of the number two, while it is half of the number eight. Thus, the number four possesses both correlatives, though in relation to different things. Each thing under a genus, however, should be able to have only one of the differences which divide the genus, otherwise the species will overlap. If the opposite "double" and "half" were the specific differences dividing the species number, then four would belong to both species, since it is both double and half. Thus, correlatives would not often be used as the specific differences under a genus.

So we move on the second kind of opposition, that between contraries, for example, between the good and the bad. St. Thomas defines contraries as "what are most different in the same genus." For example, black and white are as different as colors can be. But what is true about contraries is that they often, though not always, have intermediates. For example, black and white are not the only colors. Rather, there are other colors, such as red and yellow, which are between black and white. Contraries, precisely because they are the most different within a genus, often have intermediate states come between them.

Can the specific differences of things be contraries? Contraries clearly do not have the same problem as correlatives of allowing the species to overlap: a thing can only possess one of the contraries, never both. But contraries have another problem: when they admit of intermediates, they do not exhaust the genus to be divided. For example, we could not divide the genus animal through the differences black and white because animals comes in a large variety of intermediate colors: the differences would not exhaust the genus. Thus, contraries, at least those that have intermediates, will not make good specific differences.

We must be careful about the word "contrary." Aristotle sometimes uses the word "contrary" as if it were synonymous with opposite. That is, he uses the name of the species for the genus. There is something right about this: contraries are the most opposite opposites, and when someone asks for examples of opposites, we usually give contraries. But this means that we need to be cautious when we come upon the word contrary: we should ask ourselves whether Aristotle or St. Thomas means contraries in particular, or whether they are just referring to opposites in general.

The third kind of opposition is that between privation and possession, or privatives and positives as our translation has it. Aristotle identifies the distinguishing mark of privation and possession:

Privatives and positives have reference to the same subject. Thus, sight and blindness have reference to the eye.

Taking his example, we can say that blindness is the privation, sight the possession. Blindness, of course, implies the lack of sight, or not-seeing. Yet I cannot attribute blindness to everything that lacks sight: it would be strange say that the rock or my footstool is blind. We do not call them blind because we do not expect them to see. Thus, what Aristotle means by saying that privation and possession have reference to the same subject is that the privation is only attributed to those subjects which can have the possession. The privation is the lack of the possession in the natural subject of that possession.

Can privation and possession be the opposition at the basis of specific difference? It seems that they can. This kind of opposition differs from that of the correlatives because a subject can only have one of them, either the privation or the possession, but not both. For example, the eye cannot both be blind and seeing. Thus, taking these opposites as differences will prevent overlapping species. Privation and possession differ from contraries because they have no intermediates: there is no middle between blind and seeing for the eye. So it seems that the opposition of privation and possession is both non-overlapping and exhaustive and is an appropriate basis for specific differences.

Finally, there is the opposition between affirmatives and negatives, which St. Thomas calls contradictory opposition. At first, it looks like Aristotle's discussion of this kind of opposition is out of place: this is not an opposition between simple expressions, but statements, which are complex expressions: he sits and he is not sitting are statements. Aristotle's answer is that this is not really an example of contradictory opposition, but is only like an example of contradictory opposition. He explains:

That which is affirmed and denied is not itself affirmation or denial. . . . For as the affirmation is opposed to the denial, as in the two statements "he sits" and "he does not sit," so also the thing which constitutes the matter of the statement in one case is opposed to that in the other, his sitting . . . to his not sitting.

He is saying that the two statements, he sits and he does not sit, refer to two different states, sitting and non-sitting, and that the latter two are really examples of contradictory expressions. We could say that contradictory expressions are simple expressions which indicate the presence and absence of something, and are always expressed in terms of a positive word and a negative one. For example, sitting is the positive opposite which expresses presence, and not-sitting is negative and expresses absence. Just as with the two statements one is true and the other false, so with contradictory terms it is always the case that one belongs and the other does not.

Like privation and possession, the opposition between contradictories is non-overlapping: something cannot have both contradictories. Further, it is exhaustive: everything in the genus has either one or the other of the contradictories. The difficulty for contradictories is that they are more universal than any genus, while privation and

possession are not. That is, the privation can only apply to what can have the possession, to something in a given genus, but the negative contradictory can apply to everything that is or could be, even to things which could never have the positive contradictory. For example, I cannot call a rock blind, but I can certainly say that a rock is non-seeing. Thus, the opposites seeing and non-seeing, since one applies to everything that is, are more universal than the opposites blind and seeing.

Because contradictories are so universal, they are less fit to be differences than privation and possession. Privation and possession are more suitable precisely because they remain within the genus, while contradictories spill outside the genus. For example, we can understand the specific differences which divide animal as a privation and possession: beasts lack reason, man has it, and the nature of animal, the genus, is the proper subject for reason. But the contradictories, rational and non-rational, are much broader. Not only are some animals non-rational, but so is everything in the material universe except man, including such things as colors and shapes.

Although contradictories are a little too broad to use as specific differences, they are still important. We should notice that contradictories are the most basic kind of opposition because they are always implied in the previous two kinds of opposition. For example, black and white are contraries, but black certainly implies non-white. Thus, the contradictories white and non-white are hidden within the contraries white and black. In the same way, the contradictories not-seeing and seeing are hidden within the privation and possession, blindness and sight.

Our discussion of the opposites has been more extensive than necessary for understanding specific differences, but that is because the subject has a more universal utility. Every distinction has its basis in some kind of opposition, but distinction is one of the first activities of philosophy: St. Thomas says that he who would philosophize must distinguish. Thus, knowing the opposites helps all philosophizing. Furthermore, distinction comes before order: we cannot order what we cannot distinguish. Therefore, the topic of opposition should prepare us to understand our next topic, order.

Order and the Relations of Prior and Posterior

Order is a relation of the prior and posterior, or of what comes before and after, so in chapter 12 of the *Categories*, Aristotle covers the different meanings of the term "prior" or before. He assigns four meanings to it, priority in time, being, knowledge, and goodness. Let us briefly look at each kind.

Prior in time is the most familiar meaning of prior. Whatever is older than another comes before that other in time. For example, a house built in the year 1500 is older than one built in 2000, so that the building of the first is prior in time to the building of the second.

Prior in being is more difficult to understand. Aristotle writes:

Secondly, one thing is said to be prior to another when the sequence of their being cannot be reversed, as one is prior to two.

What Aristotle means when he says that the sequence of their being cannot be reversed is that the first can exist without the second, but the second cannot exist without the first. His example uses numbers of things: I can have one cow, and not have two cows, but I cannot have two cows without also having one. The possession of one cow is prior in being to the possession of two, even if I bought both cows at the same time. Another example: God did not have to make creatures; God can exist without creatures, but creatures cannot exist without God. Thus, God is prior in being to creatures.

Notice that being prior in being says nothing about time. I can buy both cows at the same time, and yet there is a priority of having one cow to having two. God is entirely outside time, which He has created. Therefore, God is not prior to creatures in time. Yet God is still prior to creatures in being because he can exist without them, but the sequence cannot be reversed.

The third meaning of "prior" is like the second: just as a first is prior to a second in being because it can exist without the second, but the second cannot exist without the first, so also one thing is prior another in knowledge when the first can be known without the second being known, while the second cannot be known unless the first is already known. For example, a child learning to count may know how to count to five without being able to count to ten, but if he can count to ten he can also count to five. Five is prior to ten in our knowledge.

We should notice that what is prior in knowledge is not always the same as what is prior in being. For example, God is prior to creatures in being, but creatures are prior to God in the order of our knowledge. That is, a man may know much about creatures, and nothing about God, but he cannot know nothing about creatures and know something about God because God is known through His creation. Therefore, prior in being and prior in knowledge, while defined in parallel ways, are not the same thing.

The last main meaning of prior is that which is prior in goodness. Aristotle means that what is better is prior in goodness. This may seem a strange use of the term, but there are a couple of ordinary expressions which show that Aristotle is right to give it this meaning. First, the champions in any sport always boast that they are number one. By number one they are indicating that they are first, prior to all the other teams. Why are they first? Because they are the best, and the better is prior to the worse. Moreover, we tell people to get their priorities straight, to put first things first. A man who desires wealth more than virtue has his priorities mixed up. Why? Because virtue is better than wealth, and should be prior to it, but he thinks wealth is better than, prior to, virtue. So we do use the term prior to mean better than. There is an order of goodness.

The knowledge of the kinds of order is vital to all of philosophy. As Aristotle says, the task of the wise man is to order, and one cannot order without knowing order and its kinds. Moreover, one of these kinds of priority is especially important to definition: the order of knowledge. When we are looking for the definition of a thing, we usually find not one, but many genera which apply to it. Man is not only an animal, he is a living thing, a body, and a substance. The question is: in what order are these attributed to man? How should I order the genera in man's definition. Aristotle answers: according to the order of

knowledge. The highest, most remote genus is the one which is first known, and the intermediates are ordered according to that knowledge. I cannot know what an animal is without knowing what a living thing is, but I can know what a living thing is without knowing exactly what an animal is. Living thing is therefore prior in knowledge to animal, and is the higher genus. Thus, the knowledge of order is useful for defining.

Conclusion

We have covered almost all of the fundamentals of the logic of the first operation. The first operation aims at definition, which we discussed in our second lesson. In the third, we talked about the categories, which are tools that help us to use the tool of genus in our definitions. In this lecture, we have discussed opposition and order, which are useful for determining both differences and genera. There is one more topic to cover in the logic of the first operation: the use of analogy. In our next lesson we will discuss the logic of analogy, and then we will move on to the logic of the second operation of the intellect, which is the understanding the true and the false.

Exercises

How are the following terms opposed?

1. Black -- white
2. Hot -- cold
3. Rational -- irrational
4. Black -- non-black
5. Deaf -- hearing
6. Quadruple -- one-fourth
7. Parent -- offspring
8. Odd -- even
9. Cause -- effect
10. Lame -- able-bodied

In what way(s) is the first term prior to the second?

1. God -- creatures
2. Creatures -- God
3. One -- two
4. Baby -- man
5. Man -- baby
6. Ignorant man -- wise man
7. Wise man -- ignorant man
8. Plants -- animals
9. B.C. -- A.D.
10. Socrates -- picture of Socrates

Lesson 5: Analogy and the Statement

Readings

On Interpretation (1-4)

by Aristotle, translated by E. M. Edghill

1.

First we must define the terms 'noun' and 'verb', then the terms 'denial' and 'affirmation', then 'proposition' and 'sentence.' Spoken words are the symbols of mental experience and written words are the symbols of spoken words. Just as all men have not the same writing, so all men have not the same speech sounds, but the mental experiences, which these directly symbolize, are the same for all, as also are those things of which our experiences are the images. This matter has, however, been discussed in my treatise about the soul, for it belongs to an investigation distinct from that which lies before us.

As there are in the mind thoughts which do not involve truth or falsity, and also those which must be either true or false, so it is in speech. For truth and falsity imply combination and separation. Nouns and verbs, provided nothing is added, are like thoughts without combination or separation; 'man' and 'white', as isolated terms, are not yet either true or false. In proof of this, consider the word 'goat-stag.' It has significance, but there is no truth or falsity about it, unless 'is' or 'is not' is added, either in the present or in some other tense.

2.

By a noun we mean a sound significant by convention, which has no reference to time, and of which no part is significant apart from the rest. In the noun 'Fairsteed,' the part 'steed' has no significance in and by itself, as in the phrase 'fair steed.' Yet there is a difference between simple and composite nouns; for in the former the part is in no way significant, in the latter it contributes to the meaning of the whole, although it has not an independent meaning. Thus in the word 'pirate-boat' the word 'boat' has no meaning except as part of the whole word.

The limitation 'by convention' was introduced because nothing is by nature a noun or name-it is only so when it becomes a symbol; inarticulate sounds, such as those which brutes produce, are significant, yet none of these constitutes a noun.

The expression 'not-man' is not a noun. There is indeed no recognized term by which we may denote such an expression, for it is not a sentence or a denial. Let it then be

called an indefinite noun. The expressions 'of Philo', 'to Philo', and so on, constitute not nouns, but cases of a noun. The definition of these cases of a noun is in other respects the same as that of the noun proper, but, when coupled with 'is', 'was', or 'will be', they do not, as they are, form a proposition either true or false, and this the noun proper always does, under these conditions. Take the words 'of Philo is' or 'of or 'of Philo is not'; these words do not, as they stand, form either a true or a false proposition.

3.

A verb is that which, in addition to its proper meaning, carries with it the notion of time. No part of it has any independent meaning, and it is a sign of something said of something else.

I will explain what I mean by saying that it carries with it the notion of time. 'Health' is a noun, but 'is healthy' is a verb; for besides its proper meaning it indicates the present existence of the state in question.

Moreover, a verb is always a sign of something said of something else, i.e. of something either predicable of or present in some other thing.

Such expressions as 'is not-healthy', 'is not, ill', I do not describe as verbs; for though they carry the additional note of time, and always form a predicate, there is no specified name for this variety; but let them be called indefinite verbs, since they apply equally well to that which exists and to that which does not. Similarly 'he was healthy', 'he will be healthy', are not verbs, but tenses of a verb; the difference lies in the fact that the verb indicates present time, while the tenses of the verb indicate those times which lie outside the present.

Verbs in and by themselves are substantival and have significance, for he who uses such expressions arrests the hearer's mind, and fixes his attention; but they do not, as they stand, express any judgement, either positive or negative. For neither are 'to be' and 'not to be' the participle 'being' significant of any fact, unless something is added; for they do not themselves indicate anything, but imply a copulation, of which we cannot form a conception apart from the things coupled.

4.

A sentence is a significant portion of speech, some parts of which have an independent meaning, that is to say, as an utterance, though not as the expression of any positive judgement. Let me explain. The word 'human' has meaning, but does not constitute a proposition, either positive or negative. It is only when other words are added that the whole will form an affirmation or denial. But if we separate one syllable of the word 'human' from the other, it has no meaning; similarly in the word 'mouse', the part 'ouse' has no meaning in itself, but is merely a sound. In composite words, indeed, the parts contribute to the meaning of the whole; yet, as has been pointed out, they have not an independent meaning.

Every sentence has meaning, not as being the natural means by which a physical faculty is realized, but, as we have said, by convention. Yet every sentence is not a proposition; only such are propositions as have in them either truth or falsity. Thus a prayer is a sentence, but is neither true nor false.

Let us therefore dismiss all other types of sentence but the proposition, for this last concerns our present inquiry, whereas the investigation of the others belongs rather to the study of rhetoric or of poetry.

Outline

I. Introduction.

A. Two subjects

1. Analogy.
2. The Statement.

II. Analogy.

A. What analogy is.

1. Example in Categories: equivocal has related meanings.
 - a. Not always related, so two kinds of equivocals: analogy and pure.
2. Analogy middle between univocal and pure equivocal: partly the same, partly different meaning.
3. Analogy has an order among the meanings.
 - a. Example: the word medical.

B. Objection: seems analogy leads to confusion.

1. Analogy is tool which uses likeness to make known what something is.
 - a. Example of analogy making something known: seeing.
2. Analogy necessary in theology.

III. The second operation and the statement.

A. Meaning of title On Interpretation: statement is an interpreter.

1. Why statement is the perfect interpreter.
2. Relation of speech, thought, and reality.
3. Difference between first and second operation.

B. Definition of statement and its parts.

1. Genus of parts of statement: simple expressions signify by convention.
 - a. Simple expressions have no part which signifies by itself.
2. Difference between noun and verb: verb signifies with time.
 - a. Noun signifies without time.
3. What kind of sentence a statement is: signifies the true or false.

IV. Conclusion: next time kinds of statements and relations between them.

Supplementary Text

Introduction

We have finished our discussion of Aristotle's *Categories*, and so in this lesson we are going to move on to his treatise *On Interpretation*, which covers the logic of the second operation. That logic focuses on the statement: the statement is the fundamental logic tool for grasping the true and the false. Before we leave the logic of the first operation behind, I would like to cover a topic which belongs to that part of logic, but is only hinted at by Aristotle: the topic of analogy.

Analogy

Let us take a second look at the beginning of the *Categories*, where Aristotle distinguishes between univocal and equivocal uses of a word. A word is used univocally when it is used at least twice but has the same meaning in both cases. For example, a man and an ox are both called animals, and the word "animal" has the same meaning, "sensitive living thing," in both cases. Thus, the word "animal" is used univocally. Aristotle says that a word is used equivocally when it is used at least twice and is used with at least two different meanings. Let us look closely, however, at the example he uses. He writes:

Thus, a real man and a figure in a picture can both lay claim to the name "animal," yet these are equivocally so named, for though they have a common name, the definition corresponding with the name differs for each.

Notice that in this example, the definition of animal which we apply to the picture and the man, while not exactly the same, is not entirely different. The man is a sensitive living thing, and the picture of a man is an image of a sensitive living thing. In the example Aristotle gives, the meanings are not entirely the same, but neither are they entirely different.

But it is not always the case that the definitions of words used equivocally are somewhat the same. A flying mammal and the club used to hit a baseball are called bats equivocally, and the two meanings have no relation to each other. So sometimes the different meanings of words used equivocally have no relation, sometimes they have some relation.

St. Thomas uses this distinction to identify two kinds of equivocal uses of a name. He writes:

And this way of being common is a middle between pure equivocation and simple univocity. For in those things which are named analogously, there is neither one meaning, as there is with univocals, nor totally diverse meanings, as in equivocals.

St. Thomas here is talking about analogy. When the word used twice has two entirely different meanings, that is pure equivocation. But when a word is used analogously, the two meanings are neither the same, nor entirely different; rather, they are partly the same, and partly different. The picture of a man is called an animal, not with the same meaning as when I call a real man an animal, and not with an entirely different meaning, but a meaning that is partially the same and partially different. It is not a "sensitive living thing," but it is a "*picture of a sensitive living thing.*"

The next thing to notice about the many meanings of a word used analogously is that there is an order among the meanings, a priority of some over others. St. Thomas writes:

In all names which are said analogously of many things, all must be said with respect to one. Therefore, it is necessary that it be put in the definition of all. And since the meaning which the name signifies is the definition, as Aristotle says in the fourth book of the *Metaphysics*, it is necessary that the name be attributed in the first place to that which is put into the definition of the others, and secondarily of the others, in the order in which they are closer to or farther from the first thing.

St. Thomas is saying that when the same word is used analogously, and therefore has many different but related meanings, there is always some meaning that is first, and that the other meanings fall into an order, a series, which is determined by how closely they are related to the first meaning.

A good example of this is the use we make of the term "medical." We talk about medical doctors, medical students, and medical insurance. If we were to define the term in each case, we would get many different meanings, but they would all point back to the first meaning: that which makes us call the doctor "medical." Thus, the meaning of medical which is applied to the doctor is the first meaning of the term and the meaning that is contained in all of the others. Then, when we look at the other uses of the term, we find that some are closer to the original use, while some are farther away. The meanings of a student being medical is much like that of the doctor, but the meaning of insurance being medical is much farther away. Thus, there is an order in which, first the doctor is medical, then the student, and finally the insurance. There is always an order among the many meanings of a word used analogously.

Since we need to be practical about logic, we must ask why we use words analogously. What is the purpose of analogy? Some of the modern logicians do not see any purpose for analogy, and so want to eliminate it. All equivocation, they argue, is an invitation to confusion. The ideal language would assign a different word or symbol for each different meaning of definition. Thus, the presence of analogy in our language is a sign of its imperfection and an accident of its irrational origins.

Aristotle and St. Thomas would answer that the order in the meanings of analogous names points out the purpose of analogy. That order is the order of knowledge. St. Thomas says that we name things as we know them, and since we know them in a certain order, we name them that way. We could put all this another way: some things

are very familiar to us, they are part of our everyday experience, while others are hard to understand. But the ones that are hard to understand are sometimes like the things that we are familiar with. So we use the familiar things to make the unfamiliar more understood. We use the same name for both in order to point out that likeness and increase our knowledge. This is the purpose of analogy.

We can clarify this with an example. The nature of sight is clearer to us than the nature of intellectual understanding, which is very obscure. But since seeing is like understanding, we can use seeing to make the nature of understanding clearer to our minds. How, then, do we point out this likeness between sight and understanding? We use the same word to name them. We say not only that we see colors, but that we "see" what someone means when they say something. In this latter case, we use the term "see" with a second meaning, different from but related to the first. The analogous use of the word "see" helps us to grasp better what understanding is.

Analogy, then, is not only not a hindrance, but an aid to knowledge. In fact, it is often an indispensable aid. When something is entirely outside of our ordinary experience, the only way that we can name it is by analogy, since every first meaning of a term comes from our experience. Since God is entirely outside of our ordinary experience, the only way we can name God, that is, assign an attribute to God, is by an analogy to that attribute in our experience. When we say "God is wise," we give to that word "wise" a meaning that is derived from, but secondary to, the meaning which the word has when we say "Socrates is wise." Every name of God is analogous, and without analogous naming theology would be impossible.

Of course, we could say much more about analogy, as we could about much of what we discussed in the first part of logic. But I think we have covered the most fundamental and most useful points. And that completes our discussion of the first part of logic. We are now going to talk about the second part of logic, the logic of the second operation, that which deals with the true and the false. The fundamental tool of the logic of the second operation is the statement. So our first task is to look at the statement in itself, its parts and its definition. That will occupy the remainder of this lesson. In our next lesson we will look at the kinds of statements and the relations that these kinds have to each other.

The Statement

The second book of the *Organon* is titled *On Interpretation*, or in the Greek, *Peri Hermeneias*. Before we get into the details of this book, I would like to explain its title. The word "hermeneias" comes from Hermes, the messenger god. This implies that the statement, the logical tool which is the subject of the *Peri Hermeneias*, is an interpreter, a messenger, a go-between. What is the statement an interpreter for? It is an interpreter between one human mind and another. We use statements to reveal what we are thinking to other people. Thus, the book about the statement is a book about the interpreter.

This might seem a puzzling assertion, since every word, not just the statement, is an interpreter between one mind and another. I think that Aristotle means to imply that the statement is an interpreter *par excellence* because it is only when I make a statement that I fully reveal my mind to another. If I merely say the word "man," you know what the term means, and you presume that I do also. But you would remain puzzled about why I said that word. My communication would be incomplete because you would not know what I think about man. If I then said "Man has a fallen nature," whether you agreed with that statement or not, you would feel satisfied that my communication was complete, and that you knew what I was thinking. Since only the statement does this, the statement is the perfect interpreter of one mind to another.

Since the statement is the first complete speech, Aristotle takes up the question of the relation of speech to thought and reality at the very beginning of the *Peri Hermeneias*. He writes:

Sounds are the symbols of impressions in the soul, and written words are symbols of sounds. Just as not all men have the same writing, so not all men have the same speech, but the impressions in the soul, of which these are first the signs, are the same for all, as are the things, which these are likenesses of.

Let us look at this text in reverse order. Fido the dog is just Fido the dog, and it makes no difference to him whether he is seen by Cicero or George Washington. So Fido, and all of reality, is common to all men. Now when Cicero and George both see the dog, they have the same basic mental impression, since the impression in our minds is just a likeness of the thing seen. But the words used to signify that impression might be different from different men. For example, Cicero calls Fido "canis," George calls him "dog." And since the written word is a sign of the spoken word, then Cicero and George would write different words as well. The written and spoken words are different for different societies, but the mental impression and reality itself are common to all men.

Digression on the Subject of Logic

Thus there are three fundamental levels laid out here: words, thoughts, and things. Which is logic about? Is logic about words, or thoughts, or things?

I think that Aristotle would say that logic is about all three. Words are the tools of the mind, and logic is about such tools, so logic must be about words. But logic is not about words in the way that poetry or grammar is about words. Poetry is concerned about making words beautiful, while grammar makes words be fittingly arranged, but logic uses words to guide thought to the truth. For example, the statement "Men is animals" would offend the rules of both poetry and grammar, but not logic. Logic approves because the statement is true, and truth is its goal. Logic is about words insofar as they somehow lead to knowledge of the truth.

Since logic uses words to guide thought, it must also be about thought. But it does not study thought to understand the nature of thought. That is the task of philosophical

psychology. Logic studies thought only to perfect its process, not to know its nature completely. Thus, logic is about both words and thoughts.

Finally, since thought aims at the truth about things, then logic cannot ignore reality. Logic takes for granted our basic knowledge of reality in formulating the rules of thought. Aristotle could not talk about the categories, for example, without assuming many basic truths about the nature of reality. Logic then is about all three, words, thoughts, and things. Maybe the best way to express what logic is about, then, is through this formula: **logic is about words that signify things through our thoughts.**

Return to the Statement

Aristotle's next task is to clarify the difference between the first and second operations. He writes:

As there are in the mind thoughts which do not involve truth or falsity, and also those which must be either true or false, so it is in speech. . . . "Man" and "white" as isolated terms, are not yet either true or false.

Aristotle first points to the obvious fact that we do not assign truth or falsity to simple expressions, like "man." In fact, we do not even assign it directly to definitions, such as "rational animal." We only assign truth and falsity when such terms are combined in statements, for example, "Man is a rational animal."

Thus, Aristotle concludes:

Truth and falsity imply composition and division.

The reason why truth and falsity come in only with composition and division is that truth in speech is the conformity between what is said and the way something is in reality, while falsity is the opposition between what is said and the way something is. When I say "man" I do not express the way man is, since "the way" in which something exists is different from and added to the subject that exists in that way. "Man" is simply a subject that exists, but when I combine "man" with "runs" and say "The man runs," then I express the way man exists. Only then can I check whether that way I am speaking conforms to the reality signified. Only then can I speak about truth and falsity, truth if the man is running, falsity if he is not. And since truth and falsity in speech corresponds to truth and falsity in thought, we can see that only the second operation of the intellect concerns the true and the false.

Aristotle first defines the parts of the statement, then the statement itself. The statement itself is complex, but its fundamental parts are simple. In the *Categories* Aristotle is dealing with simple expressions, but he was content there to give examples; here, he gives a definition. A simple expressions is:

. . . a sound significant by convention, . . . of which no part is significant apart from the rest.

As we noted before, words are different for different languages, so the sound of the word cannot by itself, naturally point to a thing. It can only point to a thing if those speaking the language agree to that.

An expression is simple when no part of it signifies by itself, at least not in such a way that the meaning of the part determines the meaning of the whole. For example, the word "dog" has a part, "og," but that part does not mean anything by itself. Thus, "dog" is a simple expression. Sometimes by accident a word has a part which does have its own meaning, but if the expression is simple, the meaning of the part does not determine the meaning of the whole. For example, "table" is part of the whole word "stable," but the meaning of the part "table" has nothing to do with the meaning of the whole word "stable."

The statement is made of simple expressions of two kinds, the noun and the verb. The difference between them is that the noun signifies something without implying time, while the verb signifies something and implies time. In grammatical terms, nouns do not have tenses, verbs do. The reason is that the verb signifies something that is attributed to the noun, as happening to the noun, and the *happening* implies time. For example, in the statement, "The man runs," "man" is the noun and "runs" is the verb. Running is attributed to man, and since what is attributed to a thing affects how a thing is, then we can look at running as something that *happens* to the man. Happening then brings in the notion of change: if it is happening to him, we have to ask *when* it is happening. Is it happening now, or in the past, or in the future? The tense of this verb tells us that it is happening now: "runs" is the present tense. Thus every verb, because it is something attributed to another, implies time.

The noun, however, does not imply something happening to another, but instead points to the subject which has something happening to it. The subject is always the stable thing in the happening, and therefore time does not matter to it: the man is a man, whether he is running now, or ran in the past, or will run in the future. So the noun signifies without time.

But when we put the noun and the verb together, we get a statement. Aristotle does not define the statement all in one place, but we can gather a definition from several places. First, since the statement is made of simple expressions, it will be a complex expression because its parts do signify something by themselves. The name which Aristotle assigns to the genus of simple expressions is "sentence." Thus, we can ask what kind of sentence a statement is. Aristotle writes:

Not every sentence is a statement; only such are statements as have in them either truth or falsity. Thus, a request is a sentence, but is neither true nor false.

There are several kinds of sentences, such as questions, commands, requests, and all are complex; that is, all have parts which have meaning by themselves. None of these others, however, express something that is true or false. For example, "Is the dog in the yard?" or "Leave the yard" are sentences, but not true or false. Only a statement, such

as "The dog is in the yard," does that. Thus the definition of the statement is a sentence which is true or false.

Conclusion

Since the purpose of logic is to aid the mind in knowing the truth, Aristotle dismisses all other kinds of sentences here and deals only with statements. In this lesson we have discussed the parts and definition of the statement. The noun and verb are its parts, and the statement is a sentence that is true or false. In our next lesson we are going to look at how Aristotle divides statements into kinds, and how he determines the important relations between the different kinds of statements.

Exercises

1. Examine the words used equivocally in Exercise One of Lesson Three and determine whether they are used purely equivocally or analogously.

2. Identify the noun and the verb in the following statements. If an entry is not a statement, note that.

1. Fido is a dog.
2. Triangles have three sides.
3. What a good speech!
4. Philosophers love wisdom.
5. Do sophists love wisdom?
6. Men are apes wearing trousers.
7. Let us pursue virtue.

Lesson 6: The Kinds of Statements and Relations of Opposition Between Them

Readings

On Interpretation (5-8)

by Aristotle, translated by E. M. Edghill

5.

The first class of simple propositions is the simple affirmation, the next, the simple denial; all others are only one by conjunction. Every proposition must contain a verb or

the tense of a verb. The phrase which defines the species 'man', if no verb in present, past, or future time be added, is not a proposition. It may be asked how the expression 'a footed animal with two feet' can be called single; for it is not the circumstance that the words follow in unbroken succession that effects the unity. This inquiry, however, finds its place in an investigation foreign to that before us.

We call those propositions single which indicate a single fact, or the conjunction of the parts of which results in unity: those propositions, on the other hand, are separate and many in number, which indicate many facts, or whose parts have no conjunction. Let us, moreover, consent to call a noun or a verb an expression only, and not a proposition, since it is not possible for a man to speak in this way when he is expressing something, in such a way as to make a statement, whether his utterance is an answer to a question or an act of his own initiation.

To return: of propositions one kind is simple, i.e. that which asserts or denies something of something, the other composite, i.e. that which is compounded of simple propositions. A simple proposition is a statement, with meaning, as to the presence of something in a subject or its absence, in the present, past, or future, according to the divisions of time.

6.

An affirmation is a positive assertion of something about something, a denial a negative assertion.

Now it is possible both to affirm and to deny the presence of something which is present or of something which is not, and since these same affirmations and denials are possible with reference to those times which lie outside the present, it would be possible to contradict any affirmation or denial. Thus it is plain that every affirmation has an opposite denial, and similarly every denial an opposite affirmation.

We will call such a pair of propositions a pair of contradictories. Those positive and negative propositions are said to be contradictory which have the same subject and predicate. The identity of subject and of predicate must not be 'equivocal'. Indeed there are definitive qualifications besides this, which we make to meet the casuistries of sophists.

7.

Some things are universal, others individual. By the term 'universal' I mean that which is of such a nature as to be predicated of many subjects, by 'individual' that which is not thus predicated. Thus 'man' is a universal, 'Callias' an individual. Our propositions necessarily sometimes concern a universal subject, sometimes an individual.

If, then, a man states a positive and a negative proposition of universal character with regard to a universal, these two propositions are 'contrary'. By the expression 'a proposition of universal character with regard to a universal', such propositions as 'every

man is white', 'no man is white' are meant. When, on the other hand, the positive and negative propositions, though they have regard to a universal, are yet not of universal character, they will not be contrary, albeit the meaning intended is sometimes contrary. As instances of propositions made with regard to a universal, but not of universal character, we may take the 'propositions 'man is white', 'man is not white'. 'Man' is a universal, but the proposition is not made as of universal character; for the word 'every' does not make the subject a universal, but rather gives the proposition a universal character. If, however, both predicate and subject are distributed, the proposition thus constituted is contrary to truth; no affirmation will, under such circumstances, be true. The proposition 'every man is every animal' is an example of this type.

An affirmation is opposed to a denial in the sense which I denote by the term 'contradictory', when, while the subject remains the same, the affirmation is of universal character and the denial is not. The affirmation 'every man is white' is the contradictory of the denial 'not every man is white', or again, the proposition 'no man is white' is the contradictory of the proposition 'some men are white'. But propositions are opposed as contraries when both the affirmation and the denial are universal, as in the sentences 'every man is white', 'no man is white', 'every man is just', 'no man is just'. We see that in a pair of this sort both propositions cannot be true, but the contradictories of a pair of contraries can sometimes both be true with reference to the same subject; for instance 'not every man is white' and 'some men are white' are both true. Of such corresponding positive and negative propositions as refer to universals and have a universal character, one must be true and the other false. This is the case also when the reference is to individuals, as in the propositions 'Socrates is white', 'Socrates is not white'.

When, on the other hand, the reference is to universals, but the propositions are not universal, it is not always the case that one is true and the other false, for it is possible to state truly that man is white and that man is not white and that man is beautiful and that man is not beautiful; for if a man is deformed he is the reverse of beautiful, also if he is progressing towards beauty he is not yet beautiful.

This statement might seem at first sight to carry with it a contradiction, owing to the fact that the proposition 'man is not white' appears to be equivalent to the proposition 'no man is white'. This, however, is not the case, nor are they necessarily at the same time true or false.

It is evident also that the denial corresponding to a single affirmation is itself single; for the denial must deny just that which the affirmation affirms concerning the same subject, and must correspond with the affirmation both in the universal or particular character of the subject and in the distributed or undistributed sense in which it is understood.

For instance, the affirmation 'Socrates is white' has its proper denial in the proposition 'Socrates is not white'. If anything else be negatively predicated of the subject or if anything else be the subject though the predicate remain the same, the denial will not be the denial proper to that affirmation, but on that is distinct. The denial proper to the affirmation 'every man is white' is 'not every man is white'; that proper to the affirmation

'some men are white' is 'no man is white', while that proper to the affirmation 'man is white' is 'man is not white'.

We have shown further that a single denial is contradictorily opposite to a single affirmation and we have explained which these are; we have also stated that contrary are distinct from contradictory propositions and which the contrary are; also that with regard to a pair of opposite propositions it is not always the case that one is true and the other false. We have pointed out, moreover, what the reason of this is and under what circumstances the truth of the one involves the falsity of the other.

8.

An affirmation or denial is single, if it indicates some one fact about some one subject; it matters not whether the subject is universal and whether the statement has a universal character, or whether this is not so. Such single propositions are: 'every man is white', 'not every man is white'; 'man is white', 'man is not white'; 'no man is white', 'some men are white'; provided the word 'white' has one meaning. If, on the other hand, one word has two meanings which do not combine to form one, the affirmation is not single. For instance, if a man should establish the symbol 'garment' as significant both of a horse and of a man, the proposition 'garment is white' would not be a single affirmation, nor its opposite a single denial. For it is equivalent to the proposition 'horse and man are white', which, again, is equivalent to the two propositions 'horse is white', 'man is white'. If, then, these two propositions have more than a single significance, and do not form a single proposition, it is plain that the first proposition either has more than one significance or else has none; for a particular man is not a horse. This, then, is another instance of those propositions of which both the positive and the negative forms may be true or false simultaneously.

Outline

I. Introduction.

A. Review definitions of statement, noun, and verb.

II. Kinds of Statements.

A. Preliminary notions.

1. What we mean by different kinds of statements.
2. Statement, proposition, enunciation.

B. Divisions themselves.

1. Affirmation and denial division according to form.
 - a. Affirmation: joining signifies joining.
 - b. Denial, joining signifies separation.
2. Second division: universal and particular statements.
 - a. Aristotle and St. Thomas on the more and less universal: comparison to the whole and part.

(1) Likeness between universal whole and part and quantitative whole and part.

(2) That the notions of whole and part are analogous.

(3) The most obvious difference: universal whole predicates of parts, quantitative not.

b. Applies these distinctions to universal and particular statements.

3. Names for two ways of dividing statements.

C. The chart of kinds of statements.

1. Particulars do not imply each other.

III. Opposition of Statements.

A. Principle: Relations between statements specified by truth and falsity.

B. Oppositions themselves.

1. Contraries: not same as in Categories.

a. Likeness to simple contraries: exclusion and middle.

b. Summing up contraries: definition and rules.

2. Contradictories: what they are.

a. Summing up contradictories: definition and rules.

IV. Objection: logic is not necessary for second operation because statements and contradiction are natural.

A. Answer: Logic of second operation perfects statements and contradictions.

V. Conclusion:

A. Summing up lesson on statements.

B. Rest of course about third operation.

Supplementary Text

Introduction

In our last lecture we were introduced to the logic of the second operation. We noticed that, since the second operation is that by which we understand the true and the false, and truth and falsity always requires some combination or separation, then the second operation takes place through a combination and separation. The words which signify that operation, then, signify some kind of combination or separation. We called those words the statement. We defined the statement as a complex expression which is true or false and we said that it had two parts: the noun, which is the subject of the statement and which signifies something simple without indicating time; and the verb which is predicated of the noun and which signifies something simple implying time.

In this lesson we are going to look at the kinds of statements. What we mean by different kinds of statements are not statements with different parts, with a different noun and a different verb, but statements that are formed in different ways from each other, even though they have the same noun and verb. For example, the two

statements "all men are mortal" and "no men are mortal" have the same noun and verb, but are different because they are formed in different ways and are different kinds of statement. After we have figured out the kinds of statements, we are going to look at the relations of opposition between them, how statements which have the same noun and verb can be opposed to each other. That opposition determines certain things about the truth and falsity of those statements.

Before we get to our two main topics, I would like to talk about the word "statement" itself. Other logicians often use the word "proposition" or "enunciation" instead of statement. I like the word statement because it is plain English. It clearly comes from the English word "to state" as in stating a fact and it connotes that we are talking about facts, things that are true or false. On the other hand, while the word "enunciation" is a Latin-based equivalent of statement, it suffers from having very different common meaning in English, a clear way of speaking, as in "his enunciation is very precise." The word "proposition" has a different problem. St. Thomas reserves the word "proposition" to refer to a statement insofar as it is part of a chain of reasoning. We are going to follow St. Thomas' practice and reserve the word "proposition" for the statements which is part of a chain of reasoning, and use the word "statement" for the statement taken by itself. Please keep in mind, however, the common equivalents to "statement."

The Kinds of Statements

Let us now determine the kinds of statements. Aristotle divides statements in three different ways. The first is not so much a distinction between kinds of statements as between the one and the many with regard to statements. Some statements are one, some look like one statement but are actually many. For example, the statement "Socrates is tan" is one, but "Socrates is wise and tan" is not one statement but many, although it might look like one. Aristotle explains it as follows:

We call those statements simple which indicate a single fact or the conjunction of the parts of which results in unity. Those statements on the other hand are separate and many in number which indicate many facts, and whose parts have no conjunction.

By Aristotle's account, "Socrates is tan" is a simple statement because it points to a single fact. Its parts, "Socrates" and "is tan," unite to make one whole. On the other hand, "Socrates is tan and wise" is two statements because it points to two different facts, Socrates' being tan and Socrates' being wise, one of which can be true without the other being true. In this case the verb is not one, and a noun and two verbs do not unite to form one whole. We can sum it up this way: if a statement has a single noun and a single verb, the statement is simple, otherwise it is complex.

To see if the noun and verb are simple is not always as easy as it seems: sometimes a noun or verb is simple, even though it is made of many words. For example, Aristotle considers "two-footed animal" to be a simple noun, even though it has many words, because the many make a unity. Why this is so, Aristotle points out, cannot be

explained by the logician, but only by the metaphysician. Suffice it to say that a simple statement is made of one noun and one verb, however "one" is understood.

Since complex propositions can be reduced to simple propositions, Aristotle leaves them aside and focuses on the simple proposition. Then he proceeds to make the second division, a division of simple propositions into affirmations and denials, or negations. This division is very important to use because it is a division according to the form of the proposition.

What does it mean to say that this is a division according to the form of the proposition? The form of anything is what makes something be the thing it is. For example, the shape or form of the bronze makes the bronze actually be a statue. Now the fact that something is an affirmation or denial corresponds to what combines a noun and a verb into a statement. The noun and verb are a statement because they are joined. Thus the affirmation and negation relate to the form of the statement because they are two ways of joining a noun and a verb.

A statement can join a noun and verb in such a way that it points to the things they signify being joined in reality, and such a statement is called an affirmation. For example, the statement "Socrates is tan" points to Socrates and tanness and says that the two are joined in reality. The denial also joins the noun and verb, otherwise it could not be a statement, but it joins them in such a way that the joining in words signifies a separation in reality. For example, the statement "Socrates is not tan" still joins the words "Socrates" and "is not tan," but using the term "not" points out that the two things, Socrates and tanness, are separated in reality. A joining of words that indicates a joining in reality is an affirmation, a joining in words that signifies a separation in reality is a denial or negation. That is the first division of statements into kinds.

The second division of statements into kinds looks to the matter, the noun, of the statement. Aristotle distinguishes nouns that are individual from nouns which are universal. A universal is a word that can be predicated of many things, while an individual is not predicated of many. "Man" is universal, "Socrates" is individual. In the statement "Socrates is mortal" the noun is individual, while in "men are mortal" the noun is universal. Of course, in the latter statement, "man" is the subject and so is not actually predicated of something else, but it could be predicated of something else, and that makes it universal. Thus some statements are about universals, some about individuals.

Notice that this distinction has nothing to do with how the noun and verb are joined. In our examples, the parts are joined in the same way because they are both affirmations. The distinction has to do with the noun itself, which is a kind of matter for the statement. Thus, we could say that the division according to universal and individual is division according to the matter of the statement.

A comparison might help to clarify the distinction between a division according to form and a division according to matter. The sports baseball and cricket both use bats to hit the ball. The difference is that the cricket bat is flat, it is shaped like a plank with a

handle, while the baseball bat is round like a large stick. The division of bats into baseball bats and cricket bats is a division according to shape or form, and this is like the division of statements formally into affirmations and negations.

On the other hand, we could divide baseballs bats into wooden bats and aluminum bats. This does not have to do with the form, since both kinds have the same shape. It has to do with the matter of the bats, what they are made of. That corresponds to the division between the statement which has an individual noun, and that which has a universal noun. That is the difference between the two ways of dividing statements.

Aristotle makes a division of those statements which have universal nouns. Some statements take the universal noun in all of its universality, others do not. For example, the statement "man is mortal" can mean two things. If the noun is taken universally, it means that "all men are mortal." If the noun is not taken universally, it means that "some men are mortal." The division of statements with universal nouns into those which take the noun universally and those that do not is the essence of the division between the universal statement and the particular statement. "All men are mortal" is a universal statement, "some men are mortal" is a particular statement. "Men are mortal" is called an indefinite statement, since it is not clear whether it is meant to be universal or particular.

Once again, this division is different from the previous one. Statements about individuals are not particular statements, because particular statements have nouns which are universal. Thus, "Socrates is mortal" is an individual, not a particular, statement, while "some men are mortal" is a particular, but not an individual, statement.

St. Thomas will speak about the case this way: the universal statement takes the universal noun in virtue of its universality. The particular statements predicates something of the universal noun, not in virtue of its universality, but in virtue of a part of it. That is why it is called "particular." It would be fitting to take some time here to talk about how the notions of whole and part work in logic.

Digression on the Whole and Part in Logic

Aristotle and St. Thomas themselves compare the relation between the universal and the particulars to the relation between the whole and its parts in quantified things. The universal is a word that can be predicated of many. A species, for example, is universal because it can be predicated of many individuals: Socrates, Plato, and Aristotle are all men. The genus is universal because it can be predicated of many species, and the individuals under those species: man, dog, Socrates, and Fido are all animals. But the genus has a greater universality than the species, because the genus is said of more things. Animal is predicated of everything that man is, and more: not only are Socrates and Plato animals, but so are Fido and Rover. Thus the more universal is greater than the less universal.

Now we see a similar relation in wholes and parts. The famous axiom is that the whole is greater than any of its parts. Since the relation of whole to part is greater to less, and

that of more universal to less universal is greater to less, the word "whole" may have its meaning extended to apply to the universal, and the word "part" is extended to the less universal. For example, the species man is called "part" of the "whole" genus animal. And the less universal is called "particular" in relation to the more universal.

We need to understand, however, that the terms "whole" and "part" are used in an extended, or analogous, sense when we say that the species is part of the whole genus. The first meaning of whole and part points to physical or quantitative wholes and parts. The child wants the whole candy bar, we only give him part of it. The semicircle is part of the whole circle. Universal terms are not quantitative wholes and parts. There are important differences between the two ways of talking about wholes and parts.

First, the quantitative whole is made by putting its parts together, but the universal whole is made by taking something away from the parts. Thus, I can make a whole circle by putting two semicircles together, but I make the whole "animal" by taking something away from its parts, man and beast. That is, both man and beast are sensitive living things, but man is rational and the beasts are irrational. The genus "animal" cannot be made by putting man and beast together, otherwise the genus would have conflicting parts; that is, "animal" would be at the same time both rational and irrational. Rather, the genus comes to be when the differences between the species under it are taken away or put aside. Thus, when we say that man and beast are the species of the genus "animal," in the genus we take away from the species what makes them different, rational and irrational. "Animal" just means "sensitive living thing" and it leaves aside the question of rational or irrational altogether.

Second, the quantitative whole is never predicated of its parts, while the universal whole is always predicated of its parts. For example, I never say that a semicircle is a circle, but I do say that man is an animal. I must say that man is an animal, because being predicated of its parts is of the very definition of the universal: the universal is what is predicated of many. Thus while the analogy between the universal and quantitative whole helps us to understand the universal better, we must be careful not to confuse the two.

Return to Kinds of Statements

Now we can see what Aristotle means when he talks about statements which take the subject either universally or particularly. When the subject is universal, it can be taken as a whole, and we indicate that by the terms "all" or "every" or even "no." Thus, every man is mortal and no man is mortal both take the subject man universally. We can also take the subject particularly, that is, we can predicate something of the subject because some particular underneath the universal has that predicate, and we indicate this by words like "some" or "many" or "a few." For example, "some man is tan" is true, not because man as a whole is tan, but in virtue of that fact that some particular individual, let us say Socrates, is tan. Similarly, we can say that some animals are rational, not because rational belongs to the whole genus, but because part of the genus, the species man, has it. That is what makes statements universal or particular.

In philosophy we are for the most part concerned with statements that have universal nouns for their subjects. The philosopher is not so much interested in Socrates as in the universal "man," which signifies human nature itself. We are going to focus, then, on just two divisions of statements, that between affirmations and negations and that between universal and particular statements. The division between affirmations and negations is a division according to the *quality* of the statement, while that between universal and particular statements, since it is analogous to quantitative whole and part, is a division according to the *quantity* of the statement. When combine, or cross, the two divisions, we get four basic kinds of statements, as is shown in Chart #1.

The first kind is in the upper left, the universal affirmation. It has a universal quantity and an affirmative quality. An example is "all men are mortal." It is symbolized (we will see why it is symbolized this way later) by the letter A. The second kind is the universal denial. It has a universal quantity and a negative quality. An example is "no men are mortal" and it is symbolized by the letter E. The third kind is the particular affirmation. It has a particular quantity, but an affirmative quality. An example is "some men are mortal" and it is symbolized by the letter I. Finally, there is the particular denial. It is particular in quantity, negative in quality, and is symbolized by the letter O. An example is "some men are not mortal." Thus, there are four kinds of simple statement with a universal noun, the universal affirmation and denial, and the particular affirmation and denial.

One thing to note about the two particular statements is that they do not imply each other. The statement "some men are mortal" points only to a group of men and says that they are mortal. We cannot infer from it that "some men are not mortal." The first statement implies nothing about whether the other men are mortal or not mortal. The rest of the men might also be mortal, or they might not be. Thus, it could be the case that some men are mortal and others not, or it could be the case that all men are mortal. The particular statement, both affirmative and negative, speaks only about part of the whole, and implies nothing at all about the rest of the whole.

These are the basic, though not the only, kinds of statements which Aristotle covers in *Peri Hermeneias*. Later in the book he covers statements which have negative nouns and verb, such as non-Catholic, and also statements which talk about the possible and necessary, such as "it is possible that all men are tan." We are going to skip those discussions and focus on the four basic kinds of statements. Our next task is to talk about the relations of opposition between these statements.

Oppositions Among Statements

Remember, statements are concerned with the true and the false. The relations of opposition, then, are specified by how statements are related looking to their truth and falsity. What I am saying will become clearer when we look at examples of these relations.

Aristotle himself gives names for two of these relations, so we will cover those first. Aristotle writes:

If a man makes a positive and negative statement of a universal character with regard to a universal, these two statements are contrary. For example, Every man is white, no man is white.

When I have two statements which have the same noun and the same verb, and both are universal, but one is an affirmation and the other a denial, the statements are called contrary statements. We need to keep in mind that this sense of the term "contrary" is different from the one used by Aristotle in the *Categories*. There, contraries referred to simple things which were most different from each other in the same genus. White and black are contraries in the sense of that term used in the *Categories*. Here we are talking about something complex, the statement. Statements are not contrary in the sense in which that term is used in the categories, but because certain statements are opposed to each other in a similar way to how certain simple things are opposed to each other, by an analogy these statements are called contraries.

What is the similarity between simple contraries and contrary statements? Simple contraries are opposed so that one excludes the other, and yet there is a middle ground possible, so that at one time one contrary is present, at another time the other contrary, but at other times neither contrary is present. For example, sometimes a colored object is white, at other times it is black, and at still other times it is neither, but some intermediate color, such as blue. Contrary statements are like this. The truth of one of the statements excludes the other, yet there is a middle ground in which neither statement is true. For example, the statements "every man is tan" and "no man is tan" are contrary statements. The truth of one excludes the truth of the other. If the first is true, the second must be false, while if the second is true, the first must be false. There is, however, a middle ground because it is possible for both to be false: instead, it might be true that some men are tan, and some are not tan. Since statements opposed in this way exclude each other, and yet admit of a middle ground, they are like simple contraries and are called contrary statements.

Chart 2

We can sum up contrary statements as follows. Statements are contrary to each other when, having the same noun and verb, and both being universal, one is affirmative and the other negative. It is impossible for both contrary statements to be true, but it is possible for both to be false. Chart #2 is a variation on Chart #1 and is called the square of opposition. The contrary relation is that which goes across the top of the chart between the two universal propositions.

The next relation is called "contradiction." Aristotle writes:

An affirmation is opposed to a denial in the sense which I denote by the term "contradictory" when, though the subject remains the same, the affirmation is of a universal character and the denial is not.

Then Aristotle gives an example:

The affirmation "every man is white" is the contradictory of the denial "not every man is white." Or again, the statement "no man is white" is the contradictory of the statement "some men are white."

Two statements are contradictory when, while they have the same noun and verb, they differ from each other both in quantity and quality. This is different from contraries, which differ in quality but have the same quantity, universal. In the square of opposition, the contradictory relations are signified by the two diagonal lines. The universal affirmation and the particular denial are one set of contradictories, while the universal denial and the particular affirmation are the other set. Aristotle gives simple examples of contradictory statements: every man is white and some men are not white are contradictory to each other, and no man is white and some man is white are also contradictory to each other.

Contradictories have a similarity to the simple contradictories we talked about in the *Categories*, although I should note that the order of analogy is reversed from that of the contraries: the simple contradictories were called contradictory because they are like contradictory statements. The likeness is the following: with simple contradictories, it was always the case that either one or the other belonged to every subject. There was no middle ground. In the same way with contradictory statements, there is no middle ground. It is always the case that one is true and the other is false, even though we might not know which. For example, if "every man is white" is true, then "some man is not white" must be false. On the other hand, if "every man is white" is false, then "some man is white" must be true. We may not know which one is true, but we know that one always is.

We can sum up contradictories in this way: two statements are contradictory when, having the same noun and verb, they differ both in quality and in quantity. The rule that fits this relation is that, of every pair of contradictories, one is true and the other is false.

The later scholastics pointed out two other relations, which are shown in the chart. First, there is the relation of subcontraries. Statements which have the same noun and verb, and both are particular in quantity, but differ in quality, are called subcontraries. For example, "some men are white" and "some men are not white" are subcontraries. The rule for this opposition is the reverse of that for contraries: it is possible that both are true, but not that both are false. This rule follows from the two rules stated by Aristotle. Remember, as we said before, that one particular statement does not imply the other. Thus subcontraries do not imply each other.

The last opposition on our chart is between subalternates. Statements which have the same noun and verb, and the same quality, but differ in quantity, are related as subalternates. More strictly, the particular is the subalternate of the universal. For example, "some men are white" is the subalternate of "all men are white." The rule for this relation also follows from the rules for the first two relations: if the universal is true, the particular is also true, while if the particular is false, the universal is also false. It does not work the other way around: if the universal is false, that tells us nothing about the particular, and if the particular is true, that tells us nothing about the universal.

Since the last two rules follow from the first two, it is not necessary to memorize them because one can always figure them out when he needs to. For example, if "no man is tan" is true, then I can figure out its subalternate, "some men are not tan" is also true. For if "no man is tan" is true, then "every man is tan" is false by the rule of contraries, and then by the rule of contradictories "some man is not tan" must be true. I can do likewise with the subcontraries. That is why Aristotle himself lays out only the two basic kinds of opposition, and leaves the rest to be inferred by us.

The last thing I want to speak about is the necessity of logic for the second operation of the intellect. Of course, we do not need logic to teach us to make statements because we do that naturally. We even argue about things and oppose the opinions of others naturally. It might seem, then, that there is no real need for a logic in this operation of the intellect.

It is true that we naturally make statements, but the statements we make naturally are imperfect and imprecise. They do not fully convey the truths we wish to affirm. We might mean to affirm that every human soul is immortal, but our statement "the soul is immortal" does not necessarily convey that. The logic of the second operation teaches us how to make precise statements which convey exactly what we mean. Moreover, when we oppose what we consider falsity in the opinions of others, we initially do it badly because we do not understand how their statements should be opposed. When another says that no soul is immortal, we do not initially know whether we should oppose it by saying that all souls are immortal, or just that some are. Logic helps us to craft statements that precisely oppose the false opinions of others. The kinds of statements and the square of opposition are tools which we need to affirm clearly what is true and to deny precisely what is false.

Conclusion

In this lesson we have covered the fundamental kinds of statements and the relations of opposition that occur between them. We have distinguished them into four kinds according to quantity and quality: namely, the universal affirmation and denial, and the particular affirmation and denial. We have seen that the two universals are contrary to each other, but that statements which differ in both quantity and quality strictly contradict each other. We have then looked at why we need these tools for the second operation of the intellect.

For the rest of the course we will be dealing with the third operation of the intellect, discursive reasoning. In our next lessons we will begin considering the fundamental tool of the third part of logic, the syllogism. We will look at the definition and parts of the syllogism. Then we will look at the principles of the syllogism. And we will end by considering the fundamental rules of syllogistic reasoning.

Exercises

Identify the kind of statement by means of the letter which symbolizes that kind: A, E, I, or O.

1. Every grain is nutritious.
2. Some heavenly bodies are unchanging.
3. Some heavenly bodies are not unchanging.
4. All pearls are valuable.
5. No gift is unwelcome.
6. The arches of ancient Roman buildings are never pointed.
7. Every proof for the existence of God begins with creatures.
8. Metaphysicians are always also logicians.
9. Sometimes logicians are not metaphysicians.
10. A few scientists are also logicians.

Identify the kind of opposition between the propositions. If for some reason they are not strictly opposed, explain why.

1. Every grain is nutritious. - No grain is nutritious.
2. Some pearls are valuable. - No pearls are valuable.
3. No gift is unwelcome. - Some gifts are not unwelcome.
4. Metaphysicians are also always logicians. - Scientists are not always logicians.
5. Some churches are Gothic. - Some churches are not Gothic.

Mark the later statements as either TRUE, FALSE, or UNKNOWN, given the truth or falsity of the first statement. For example, if "Every grain is nutritious" is TRUE, then "No grain is nutritious" is FALSE.

1. If "Every philosopher loves wisdom" is TRUE, then:

Some philosophers love wisdom.
 No philosophers love wisdom.
 Some philosophers do not love wisdom.

2. If "Every philosopher loves wisdom" is FALSE, then:

Some philosophers love wisdom.
 No philosophers love wisdom.
 Some philosophers do not love wisdom.

3. If "Some forms are material" is TRUE, then:

Every form is material.
 No form is material.
 Some forms are not material.

4. If "Some forms are material" is FALSE, then:

Every form is material.
 No form is material.
 Some forms are not material.

Lesson 7: The Third Part of Logic and the Syllogism

Readings

(first, re-read the reading for Lesson One. Then, the following:)

Prior Analytics (I.1)

by Aristotle, translated by A. J. Jenkinson

Book I

1.

WE must first state the subject of our inquiry and the faculty to which it belongs: its subject is demonstration and the faculty that carries it out demonstrative science. We must next define a premiss, a term, and a syllogism, and the nature of a perfect and of an imperfect syllogism; and after that, the inclusion or noninclusion of one term in another as in a whole, and what we mean by predicating one term of all, or none, of another.

A premiss then is a sentence affirming or denying one thing of another. This is either universal or particular or indefinite. By universal I mean the statement that something belongs to all or none of something else; by particular that it belongs to some or not to some or not to all; by indefinite that it does or does not belong, without any mark to show whether it is universal or particular, e.g. 'contraries are subjects of the same science', or 'pleasure is not good'. The demonstrative premiss differs from the dialectical, because the demonstrative premiss is the assertion of one of two contradictory statements (the demonstrator does not ask for his premiss, but lays it down), whereas the dialectical premiss depends on the adversary's choice between two contradictories. But this will make no difference to the production of a syllogism in either case; for both the demonstrator and the dialectician argue syllogistically after stating that something does or does not belong to something else. Therefore a syllogistic premiss without qualification will be an affirmation or denial of something concerning something else in the way we have described; it will be demonstrative, if it is true and obtained through the first principles of its science; while a dialectical premiss is the giving of a choice between two contradictories, when a man is proceeding by question, but when he is syllogizing it is the assertion of that which is apparent and generally admitted, as has been said in the Topics. The nature then of a premiss and the

difference between syllogistic, demonstrative, and dialectical premisses, may be taken as sufficiently defined by us in relation to our present need, but will be stated accurately in the sequel.

I call that a term into which the premiss is resolved, i.e. both the predicate and that of which it is predicated, 'being' being added and 'not being' removed, or vice versa.

A syllogism is discourse in which, certain things being stated, something other than what is stated follows of necessity from their being so. I mean by the last phrase that they produce the consequence, and by this, that no further term is required from without in order to make the consequence necessary.

I call that a perfect syllogism which needs nothing other than what has been stated to make plain what necessarily follows; a syllogism is imperfect, if it needs either one or more propositions, which are indeed the necessary consequences of the terms set down, but have not been expressly stated as premisses.

That one term should be included in another as in a whole is the same as for the other to be predicated of all of the first. And we say that one term is predicated of all of another, whenever no instance of the subject can be found of which the other term cannot be asserted: 'to be predicated of none' must be understood in the same way.

Outline

I. Introduction.

- A. Last time four kinds of statements and their relations.
- B. Today: third part of logic, discursive reasoning, from one to another.

II. Parts and order of the Third Part of Logic.

- A. Comparison to natural processes.
 - 1. St. Thomas compares natural and rational processes.
 - 2. Three kinds of natural processes in abstract: then example of necessary: earth spinning.
 - 3. Examples of non-necessary natural processes: complete animal and monster.
- B. Three rational processes.
 - 1. First and second parts of third part: judging and discovering logic in abstract.
 - a. Judging and discovering logic: an example, God according to St. Thomas and Plato.
 - b. Necessity of discovering logic: prior and easier to understand.
 - 2. Third part: sophistic to avoid mistakes in self and others.
 - 3. Summary of three parts.
- C. Subdivisions of parts.
 - 1. Division of judging part according to necessity from form alone or also matter.
 - a. Two parts and books in Aristotle.

2. Dividing the discovering part: titles of books and comparison to natural processes.
 - a. First rational discovering process: dialectic, solid opinion, statesman.
 - b. Second discovering process: rhetoric, strong suspicion, public.
 - c. Third discovering process: poetics, tendency, representation, Macbeth.
 - d. Summary: dialectic, rhetoric, and poetics.
- III. The rest of this lecture: definitions of syllogism and its parts.
- A. Definitions of parts.
 1. Definition of the proposition. Example, not explained how differs from statement.
 2. Definition of term. Same example, leaves out being.
 - B. Definition of syllogism: complex expression made of statements.
 1. Propositions or premisses and conclusion. Example of syllogism.
 2. Follows from being so.
- IV. Conclusion: next time finish syllogism.

Supplementary Text

Introduction: Last Time Four Kinds of Statements and Their Relations

In our last lesson we completed our discussion of the second part of logic, which was about the statement. We saw that there were four kinds of statements, the universal affirmation and denial, and the particular affirmation and denial. We talked about the two basic kinds of opposition between statements: that between the contrary statements, statements which differ in quality but are both universal; and that between contradictory statements, statements which differ both in quality and quantity. We are ready, then, to move on to the third part of logic, the logic of the third operation of the intellect. In the third operation, we do not simply understand what something is, nor simply make statements about the true and the false, but we reason discursively from one truth to another.

St. Thomas Compares Natural and Rational Processes

In his Prologue to Aristotle's *Posterior Analytics*, a prologue which really introduces the whole of the *Organon*, St. Thomas goes over the subdivisions of the third part of logic. To explain his divisions, he makes a comparison between the process of discursive reasoning, and the processes in the natural world. He makes this comparison because in both cases we are talking about a process, a kind of change or motion from one thing or state to another. In reasoning we go from one truth to another, in nature things go from one state to another. The kinds of processes in nature, then, can illuminate the different kinds of rational processes.

St. Thomas identifies three basic kinds of processes in the natural world. He writes:

In certain things, nature acts by necessity, that is, in such a way that she cannot fail. In other things she works more often than not, although sometimes she falls short of her proper operation. There must be two kinds of actions in the latter case, one which happens for the most part, as when a complete animal is born from the seed; the other is when nature falls short of what is fitting, as when some monstrosity is born from the seed because of the corruption of some principle.

The events of nature, St. Thomas is saying, happen either by necessity, or usually in the same way. When they usually happen in the same way, there are two possible outcomes: the thing that usually happens happens, or the rare exception happens. An example of something that happens by necessity is the sun rising: there is no natural cause that is capable of keeping the sun from rising in the morning (or to be more precise, the earth from turning on its axis). Most natural processes, however, do not happen by necessity.

The example St. Thomas uses is the generation of a complete animal. He assumes, of course, that events in nature happen for a purpose, and that they usually achieve the purpose, and that the purpose is some good state. When nature fails to achieve its purpose, it is a bad thing. In the generation of an animal, usually the process results in a complete animal, for example, a dog which has all of its limbs and internal organs. Sometimes because of a genetic defect, a defect in the principle of generation, what results in not a complete animal, but a monstrosity, perhaps a dog without its proper limbs. That happens sometimes, but rarely, and when it does happen it is a bad thing. These are the three kinds of processes in nature.

St. Thomas then compares this to the processes in reasoning. He writes:

One process of reason produces necessity, so that there is no possibility of falling short of the truth. We achieve the certainty of science in this process. There is another process of reason which concludes to the truth for the most part, but not with necessity. The third process of reason is that in which reason falls short of the truth, because of a failure to follow some principle in reasoning.

St. Thomas is saying that, like in nature, so also in reasoning there are processes which absolutely cannot fail. This is like the process of the sun rising. There is a second process in reasoning which usually achieves the truth, but is capable of failing. That is like the natural process in which a complete animal is generated. Finally, there is a third process, in which reason fails to find the truth because it does not follow the correct rules, the true principles, of reasoning. That case is like the generation of the monstrosity.

Since there are three processes in discursive reasoning, there are going to be three parts to the third part of logic. The first part governs the first process, which never fails, so that it achieves certainty. This part of logic is called the judging part, since we make a judgement when we are certain about something. The jury judges the defendant guilty when it no longer has a reasonable doubt of his guilt. The second part governs the

second process, which succeeds for the most part, so that it achieves probability. This part of logic is called the discovering part of logic. This is called discovering because our discoveries are not certain, merely probably true.

Let me give an example to clarify this point. In his *Summa Theologiae*, St. Thomas gives five proofs for the existence of God. Those proofs yield a certain conclusion, and are formulated according to the rules of the judging part of logic. Before St. Thomas formulated these proofs, some of which he has received from previous philosophers, thinkers had been trying for centuries to discover whether God existed. The process by which someone discovers the truth about the existence of God is a different process than the one used to prove that He exists. These earlier philosophers, then, were guided by the second part of logic in their search for the existence of God. For example, if we look to Plato, he gives some very good reasons to think that God exists, but his arguments are not entirely indisputable. They yield a conclusion which is only probable. Plato is guided in his arguments by the discovering part of logic, but St. Thomas by the judging part.

There is a temptation to think that, since the judging part of logic gives a certain conclusion, while the discovering part gives us only probability, we should only use the judging part and leave aside the discovering part. There are two ways to answer this objection. First, discovery always comes before judgement. If Plato had not tried to discover the existence of God, and given a good but not foolproof argument for it, then St. Thomas would probably never have given his proofs for it. Second, an absolute proof is much harder to understand than a good argument, and a good argument prepares our minds for understanding the absolute proof. Few men are really able to understand St. Thomas' proofs who have not carefully analyzed good arguments for the existence of God first. If we neglect the discovering part of logic, we often will not be able to understand the proofs which are guided by the judging part.

There is a third part of the logic of the third operation that deals with the failure in the process of reasoning which results from not following the rules of good reasoning. St. Thomas calls this part of logic Sophistic. Of course, the point of this part of logic is not to make us reason badly, but to enable us to avoid reasoning badly and to identify bad reasoning in others. Aristotle discusses this in the book *Sophistical Refutations*. We will cover this part of logic much later in the course.

To sum up. There are three grades of reasoning, and three parts of logic which guide them. The first process achieves certainty, and is guided by the judging part of logic. The second achieves probability, and it is guided by the discovering part. The third is the failure to achieve the truth, and we avoid this through our study of the Sophistic part of logic.

In this lesson we are going to begin our consideration of the judging part of Aristotle's logic. Before we talk about the details of this part, I would like to follow St. Thomas and make some further distinctions about the kinds of reasoning processes. St. Thomas writes:

The certainty of judgement we possess through resolving comes from either the form of the syllogism alone, and the book *Prior Analytics* which is about the syllogism considered simply is ordered to this, or also from the matter, when essential and necessary propositions are taken, and the book *Posterior Analytics*, which is about the demonstrative syllogism, is ordered to this.

What is clear from what St. Thomas says is that the process of reasoning that achieves the truth by necessity is called the syllogism. What exactly a syllogism is we will discuss later in this lesson. Still, we can see that he makes a distinction between necessity which comes from the form of the syllogism, and necessity coming from the matter of the syllogism.

To explain this necessity in reasoning processes I will compare it to a kind of physical necessity. Suppose that I have a triangular piece of ice. Two things follow necessarily from this. First, the triangle made of ice has three angles which add up to 180 degrees. No matter what kind of triangle it is, this must be true. Second, the triangle made of ice, if it is left at room temperature, will necessarily melt. The two necessities, however, have different sources. The angles adding up to 180 degrees follows from the shape, or form, which the ice has taken on. Everything triangular necessarily has such angles. The fact that the ice triangle will melt has a different source, not the form or triangular shape, but the matter, the fact that it is made of ice. Thus, some necessities come from the form of a thing, some from the matter.

Something parallel happens in the process of reasoning. Some reasonings derive their necessity from their form only, while others derive a further necessity from their matter. First, let us consider an example of reasoning which has necessity according to its form alone. All running things are also moving, and since Socrates is running, Socrates must also be moving. The conclusion, Socrates is moving, follows necessarily from the two premisses. But the necessity in this case comes only from the form of the syllogism: given that the two premisses are true, the conclusion is necessarily true because it necessarily follows from the two premisses. But the conclusion, Socrates is moving, is not necessary in itself. In fact, later it might not be true because one of the premisses, Socrates is running, might later be false. He might be running now, but later he might be sitting. It is necessary only *if the premisses are true*. It is clear, then, that sometimes the necessity comes from the form of the syllogism by itself.

There are syllogisms, however, in which the conclusion derives a further necessity from its matter, the premisses which make it up. For example, we know that all triangles have three sides, and it is also true that all three-sided figures must have angles that add up to 180 degrees. It necessarily follows that all triangles have angles that add up to 180 degrees. That is, the conclusion is necessarily true not only if the premisses are true. The conclusion is necessarily true *simply speaking*. That is, unlike the previous case, the conclusion must always be true, can never be false. Why? Because the premisses from which it follows can never be false: they are necessarily true. A triangle must have three sides and three-sided figures must have 180 degrees. Thus, in this process of

reasoning, we have an absolute necessity which has its source, not just in the form of the syllogism, but also in its matter, the premisses which make up the syllogism.

There are two books of Aristotle's *Organon* which deal with the necessary processes of reasoning. The first, the *Prior Analytics*, deals with the necessity which comes from the form of the syllogism alone, leaving aside the matter involved. The second, the *Posterior Analytics*, deals with the necessity which comes from the matter of the syllogism and which results in absolutely necessary conclusions.

Logicians make a relevant distinction here. The necessity which comes from the form of the syllogism alone and is conditional on the truth of the premisses is called the necessity of consequence. That which comes from both the form and the matter, and is not conditional on the truth of the premisses (since the premisses themselves must be true), is called the necessity of the consequent. In our examples, "Socrates is moving" has the necessity of consequence, but not of the consequent, while "triangles have 180 degrees" has a necessary consequent.

Let us sum up how we have divided the third part of logic so far. The third part of logic as a whole, which directs the process of reasoning, has three separate parts, a judging part, a discovering part, and a sophistic part. The judging part is called that because it achieves some kind of certainty or necessity. That necessity comes from either the form alone, as discussed in the *Prior Analytics*, or from the matter, as is discussed in the *Posterior Analytics*. These are the two parts of the judging part of logic. We are now ready to look at St. Thomas's discussion of the discovering part.

St. Thomas is also going to divide the discovering part of logic, this time into three parts which correspond to three books in Aristotle's *Organon*, the *Topics*, the *Rhetoric*, and the *Poetics*. St. Thomas again makes a comparison between the processes of reasoning and processes in nature. He writes:

Just as we notice a kind of gradation in natural things which act for the most part, since the stronger the natural power the less often it fails to produce its effect, so also we find some gradation in the process of reason which is not entirely certain. The process of reason has that gradation insofar as it approaches more and less to perfect certainty.

St. Thomas does not give examples here, so we will supply our own. There are some processes in nature which achieve their end almost always. For example, the process of generating a new animal almost always produces a complete animal, an animal with all its limbs and internal organs. On rare occasions an animal is born which is missing a limb or organ. Other processes of nature achieve their end very often, but failures are not that uncommon. For example, nature intends to produce human beings whose eyes can see every color, but a significant minority of people are color blind. It is much more common for people to be color blind than for them to be born missing a limb. Finally, there are processes in nature which, while working more often than not, very commonly fail. For example, the body naturally aims at health and avoids sickness, and most people are healthy more often than not. Yet clearly minor sicknesses are fairly common.

Nature fails to preserve health much more often than she fails to produce a complete animal. Thus not all natural processes which admit of exceptions admit them to the same degree.

There is a similar gradation in reasoning. Sometimes reasoning which achieves the truth for the most part results in a very solid opinion. For example, after a long period of deliberation a statesman may decide that a war is probably necessary. His careful thought has yielded a solid opinion. Now a solid, well-reasoned opinion may be wrong, but most of the time it is right. Aristotle discusses this kind of reasoning in the *Topics* and calls it dialectic.

There is another kind of process of reasoning, called rhetoric, that does not produce a solid opinion, but a strong suspicion that one side of an issue is right. For example, after the statesman has decided that war is necessary, he will try to persuade the public to support the war. Of course, he cannot go through his entire thought process in a speech to the public, so his speech gives reasons which are less certain than his own process of thought. Thus, the public will have less solid reasons than he does for thinking that war is necessary. Yet, if he gives a good speech, the public will rightly have a strong suspicion that he is right and will support him in the war. Aristotle discusses the kind of reasoning in the *Rhetoric*.

Finally, we can have a tendency to fall on one side of a controversy, not because we have been given arguments, but because one man has used his reason to construct a convincing representation which attracts or repels us. For example, in *Macbeth* Shakespeare portrays ambition so vividly and horribly that the play tends to make us think that ambition is bad. Of course, this tendency which comes from a story is not as certain even as rhetorical persuasion. Still, perhaps when it is done properly, it is a not unfitting guide for the mind. Aristotle discusses the process of reason used by the writer to make this representation in his book the *Poetics*.

Thus, the discovering part of logic has three parts. The first, which produces solid opinion, Aristotle calls dialectic and this is covered in his *Topics*. The second, which is less certain and produces only strong suspicion, is called rhetoric and is covered in Aristotle's book the *Rhetoric*. The third, which is least certain and which produces a mere tendency to think in a certain way, is covered in his *Poetics*. These are the three parts to the discovering part of logic.

Aristotle discusses the last part of logic, the sophistic part, in his book *Sophistical Refutations*. Just as nature fails because of a defect in some principle of generation (what we now call a genetic defect), so reason fails when it does not follow some principle of rational discourse. The sophistic part of logic, by pointing out such defects, helps us guard against them in ourselves and others, so that we reason easily, in an orderly way, and without error.

Now that I have sketched the structure of the rest of logic, I can explain how the rest of this course is going to proceed. In the rest of this lesson, we are going to begin our consideration of the syllogism, and it is the main topic of his book *Prior Analytics*. In our

next lesson we will complete our discussion of the syllogism. In the following lesson, the ninth, we will look at the *Posterior Analytics* in which Aristotle discusses demonstration, a syllogism that is necessary according to its matter. In the tenth lesson we will look at his *Topics*, in which he discusses dialectical reasoning. In the eleventh lesson we will examine the principles in his *Sophistical Refutations*, and in the twelfth we will look at short excerpts from his *Rhetoric* and *Poetics*.

The Parts and the Definition of the Syllogism

Now that we have discussed the structure of the third part of logic, we are ready to enter into some details. First, we are going to look at the syllogism. At the beginning of the *Prior Analytics*, Aristotle defines the syllogism and its parts, the proposition and the term. We will finish this lesson with a discussion of those definitions.

Aristotle first defines the proposition:

A proposition is a sentence affirming or denying one thing or another. This is either universal, or particular, or indefinite.

We can see that Aristotle clearly defines the proposition as a kind of statement and divides the statements into the kinds which we studied before, the universal affirmation and denial, and the particular affirmation and denial. For example, "all triangles are three-sided" is a statement and, as we shall see, also a proposition. He does not explain here exactly how the proposition differs from an ordinary statement.

Instead, he goes on to define the term. He writes:

I call that a term into which the propositions are resolved, that is, the predicate and that of which it is predicated, "being" being added, and "not being" removed.

The terms, then, are parts of the proposition, or more specifically, the predicate and subject of the proposition. What is not a term, nor part of a term, is the "being" verb: "is" and "is not" are left out of the terms. The terms in our example are "triangles" and "three-sided." The "are" in our proposition is not a term, nor is the "all." The "are" serves to connect the subject and predicate, the "all" tells us to take the subject universally.

The term is a simple expression, like those in the *Categories*. It is a part of a complex expression, like the noun and verb. But it differs both from what falls into the *Categories* and the noun and the verb. It differs from the first because it is defined as part of another expression, while the expressions covered in the *Categories* are not parts. It differs from the noun because the term is essentially part of a syllogism, while it differs even more from the verb because it leaves out the "being" notion, that is, the notion of time, which is part of the essence of a verb. This will be important to remember when we speak of the conversion of propositions.

When we put terms together using the "being" word, we get propositions, and when we put propositions together we get syllogisms, so our next task is to look at the definition of the syllogism. Aristotle writes:

A syllogism is speech in which, certain things being stated, something other than what is stated follows of necessity from their being so.

We are going to take this definition part by part. First, the syllogism is speech, like the statement. It is a tool made of words which we use to do discursive reasoning. And just as the statement was more complex than the simple expressions covered in the *Categories*, so the syllogism will be more complex than the statement, because it is made of more than one statement.

The "certain things stated" are the propositions or premisses of the syllogism. The "something other than what is stated" which "follows" is called the conclusion of the syllogism. Both are statements rather than simple expressions, since each is something that can be stated. Let us label some of the parts in the following example to make this definition clear:

Every three-sided figure has angles equal to two right angles.

Every triangle is a three-sided figure.

Therefore, every triangle has angles equal to two right angles.

In this syllogism, the first two statements are the propositions or premisses of the syllogism: every three-sided figure has 180 degrees, and every triangle has three sides. The third statement is the conclusion: every triangle has 180 degrees.

Aristotle writes that the conclusion of the syllogism "follows of necessity from their being so." In our example, it is clear that if three-sided figures have 180 degrees, and triangles have three-sides, by necessity triangles must also have 180 degrees: they cannot possibly have more or less. And the conclusion follows because of these propositions, and not because of some other propositions with different terms. I need only these premisses with these three terms, "180 degrees," "three-sided," and "triangle," in order to produce the conclusion of the syllogism. That is what Aristotle means when he says that the conclusion follows by necessity "because of their being so."

I want to end this lesson by comparing a syllogism to a simple tool, the loom. The loom is a framework which weaves together two things, the threads of the warp and the woof, in order to make a third thing, the cloth. The syllogism is a loom in words: it weaves together two statements in order to produce a third statement. Or we can say that it weaves together the terms of two prior statements to produce a third statement. Remember that Aristotle refers to complex expressions as "woven together." The syllogism is the main logical tool used to "weave together" simple expressions.

Conclusion

In this lesson we had an overview of the third part of logic, and we defined the syllogism and its parts. In our next lesson we are going to discuss the principles of the syllogism, and the most useful forms of the syllogism.

Exercises

Short essays (250 words).

1. Why is it appropriate for St. Thomas to compare the parts of the third part of logic with the processes of nature?
2. Why does the third part of logic center on the syllogism when the syllogism is not the only mode of discursive reasoning?

Lesson 8: The Principles and Varieties of Syllogism

Readings

Prior Analytics (I.2, 1.4-1.7)

by Aristotle, translated by A. J. Jenkinson

Book I

2.

Every premiss states that something either is or must be or may be the attribute of something else; of premisses of these three kinds some are affirmative, others negative, in respect of each of the three modes of attribution; again some affirmative and negative premisses are universal, others particular, others indefinite. It is necessary then that in universal attribution the terms of the negative premiss should be convertible, e.g. if no pleasure is good, then no good will be pleasure; the terms of the affirmative must be convertible, not however, universally, but in part, e.g. if every pleasure is good, some good must be pleasure; the particular affirmative must convert in part (for if some pleasure is good, then some good will be pleasure); but the particular negative need not convert, for if some animal is not man, it does not follow that some man is not animal. First then take a universal negative with the terms A and B. If no B is A, neither can any A be B. For if some A (say C) were B, it would not be true that no B is A; for C is a B. But if every B is A then some A is B. For if no A were B, then no B could be A. But we assumed that every B is A. Similarly too, if the premiss is particular. For if some B is A,

then some of the As must be B. For if none were, then no B would be A. But if some B is not A, there is no necessity that some of the As should not be B; e.g. let B stand for animal and A for man. Not every animal is a man; but every man is an animal.

4.

After these distinctions we now state by what means, when, and how every syllogism is produced; subsequently we must speak of demonstration. Syllogism should be discussed before demonstration because syllogism is the general: the demonstration is a sort of syllogism, but not every syllogism is a demonstration.

Whenever three terms are so related to one another that the last is contained in the middle as in a whole, and the middle is either contained in, or excluded from, the first as in or from a whole, the extremes must be related by a perfect syllogism. I call that term middle which is itself contained in another and contains another in itself: in position also this comes in the middle. By extremes I mean both that term which is itself contained in another and that in which another is contained. If A is predicated of all B, and B of all C, A must be predicated of all C: we have already explained what we mean by 'predicated of all'. Similarly also, if A is predicated of no B, and B of all C, it is necessary that no C will be A. But if the first term belongs to all the middle, but the middle to none of the last term, there will be no syllogism in respect of the extremes; for nothing necessary follows from the terms being so related; for it is possible that the first should belong either to all or to none of the last, so that neither a particular nor a universal conclusion is necessary. But if there is no necessary consequence, there cannot be a syllogism by means of these premisses. As an example of a universal affirmative relation between the extremes we may take the terms animal, man, horse; of a universal negative relation, the terms animal, man, stone. Nor again can syllogism be formed when neither the first term belongs to any of the middle, nor the middle to any of the last. As an example of a positive relation between the extremes take the terms science, line, medicine: of a negative relation science, line, unit.

If then the terms are universally related, it is clear in this figure when a syllogism will be possible and when not, and that if a syllogism is possible the terms must be related as described, and if they are so related there will be a syllogism.

But if one term is related universally, the other in part only, to its subject, there must be a perfect syllogism whenever universality is posited with reference to the major term either affirmatively or negatively, and particularity with reference to the minor term affirmatively: but whenever the universality is posited in relation to the minor term, or the terms are related in any other way, a syllogism is impossible. I call that term the major in which the middle is contained and that term the minor which comes under the middle. Let all B be A and some C be B. Then if 'predicated of all' means what was said above, it is necessary that some C is A. And if no B is A but some C is B, it is necessary that some C is not A. The meaning of 'predicated of none' has also been defined. So there will be a perfect syllogism. This holds good also if the premiss BC should be indefinite, provided that it is affirmative: for we shall have the same syllogism whether the premiss is indefinite or particular. But if the universality is posited with respect to the minor term

either affirmatively or negatively, a syllogism will not be possible, whether the major premiss is positive or negative, indefinite or particular: e.g. if some B is or is not A, and all C is B. As an example of a positive relation between the extremes take the terms good, state, wisdom: of a negative relation, good, state, ignorance. Again if no C is B, but some B is or is not A or not every B is A, there cannot be a syllogism. Take the terms white, horse, swan: white, horse, raven. The same terms may be taken also if the premiss BA is indefinite.

Nor when the major premiss is universal, whether affirmative or negative, and the minor premiss is negative and particular, can there be a syllogism, whether the minor premiss be indefinite or particular: e.g. if all B is A and some C is not B, or if not all C is B. For the major term may be predicable both of all and of none of the minor, to some of which the middle term cannot be attributed. Suppose the terms are animal, man, white: next take some of the white things of which man is not predicated—swan and snow: animal is predicated of all of the one, but of none of the other. Consequently there cannot be a syllogism. Again let no B be A, but let some C not be B. Take the terms inanimate, man, white: then take some white things of which man is not predicated—swan and snow: the term inanimate is predicated of all of the one, of none of the other. Further since it is indefinite to say some C is not B, and it is true that some C is not B, whether no C is B, or not all C is B, and since if terms are assumed such that no C is B, no syllogism follows (this has already been stated) it is clear that this arrangement of terms will not afford a syllogism: otherwise one would have been possible with a universal negative minor premiss. A similar proof may also be given if the universal premiss is negative.

Nor can there in any way be a syllogism if both the relations of subject and predicate are particular, either positively or negatively, or the one negative and the other affirmative, or one indefinite and the other definite, or both indefinite. Terms common to all the above are animal, white, horse: animal, white, stone.

It is clear then from what has been said that if there is a syllogism in this figure with a particular conclusion, the terms must be related as we have stated: if they are related otherwise, no syllogism is possible anyhow. It is evident also that all the syllogisms in this figure are perfect (for they are all completed by means of the premisses originally taken) and that all conclusions are proved by this figure, viz. universal and particular, affirmative and negative. Such a figure I call the first.

5.

Whenever the same thing belongs to all of one subject, and to none of another, or to all of each subject or to none of either, I call such a figure the second; by middle term in it I mean that which is predicated of both subjects, by extremes the terms of which this is said, by major extreme that which lies near the middle, by minor that which is further away from the middle. The middle term stands outside the extremes, and is first in position. A syllogism cannot be perfect anyhow in this figure, but it may be valid whether the terms are related universally or not.

If then the terms are related universally a syllogism will be possible, whenever the middle belongs to all of one subject and to none of another (it does not matter which has the negative relation), but in no other way. Let M be predicated of no N, but of all O. Since, then, the negative relation is convertible, N will belong to no M: but M was assumed to belong to all O: consequently N will belong to no O. This has already been proved. Again if M belongs to all N, but to no O, then N will belong to no O. For if M belongs to no O, O belongs to no M: but M (as was said) belongs to all N: O then will belong to no N: for the first figure has again been formed. But since the negative relation is convertible, N will belong to no O. Thus it will be the same syllogism that proves both conclusions.

It is possible to prove these results also by *reductio ad impossibile*.

It is clear then that a syllogism is formed when the terms are so related, but not a perfect syllogism; for necessity is not perfectly established merely from the original premisses; others also are needed.

But if M is predicated of every N and O, there cannot be a syllogism. Terms to illustrate a positive relation between the extremes are substance, animal, man; a negative relation, substance, animal, number-substance being the middle term.

Nor is a syllogism possible when M is predicated neither of any N nor of any O. Terms to illustrate a positive relation are line, animal, man: a negative relation, line, animal, stone.

It is clear then that if a syllogism is formed when the terms are universally related, the terms must be related as we stated at the outset: for if they are otherwise related no necessary consequence follows.

If the middle term is related universally to one of the extremes, a particular negative syllogism must result whenever the middle term is related universally to the major whether positively or negatively, and particularly to the minor and in a manner opposite to that of the universal statement: by 'an opposite manner' I mean, if the universal statement is negative, the particular is affirmative: if the universal is affirmative, the particular is negative. For if M belongs to no N, but to some O, it is necessary that N does not belong to some O. For since the negative statement is convertible, N will belong to no M: but M was admitted to belong to some O: therefore N will not belong to some O: for the result is reached by means of the first figure. Again if M belongs to all N, but not to some O, it is necessary that N does not belong to some O: for if N belongs to all O, and M is predicated also of all N, M must belong to all O: but we assumed that M does not belong to some O. And if M belongs to all N but not to all O, we shall conclude that N does not belong to all O: the proof is the same as the above. But if M is predicated of all O, but not of all N, there will be no syllogism. Take the terms animal, substance, raven; animal, white, raven. Nor will there be a conclusion when M is predicated of no O, but of some N. Terms to illustrate a positive relation between the extremes are animal, substance, unit: a negative relation, animal, substance, science.

If then the universal statement is opposed to the particular, we have stated when a syllogism will be possible and when not: but if the premisses are similar in form, I mean both negative or both affirmative, a syllogism will not be possible anyhow. First let them be negative, and let the major premiss be universal, e.g. let M belong to no N, and not to some O. It is possible then for N to belong either to all O or to no O. Terms to illustrate the negative relation are black, snow, animal. But it is not possible to find terms of which the extremes are related positively and universally, if M belongs to some O, and does not belong to some O. For if N belonged to all O, but M to no N, then M would belong to no O: but we assumed that it belongs to some O. In this way then it is not admissible to take terms: our point must be proved from the indefinite nature of the particular statement. For since it is true that M does not belong to some O, even if it belongs to no O, and since if it belongs to no O a syllogism is (as we have seen) not possible, clearly it will not be possible now either.

Again let the premisses be affirmative, and let the major premiss as before be universal, e.g. let M belong to all N and to some O. It is possible then for N to belong to all O or to no O. Terms to illustrate the negative relation are white, swan, stone. But it is not possible to take terms to illustrate the universal affirmative relation, for the reason already stated: the point must be proved from the indefinite nature of the particular statement. But if the minor premiss is universal, and M belongs to no O, and not to some N, it is possible for N to belong either to all O or to no O. Terms for the positive relation are white, animal, raven: for the negative relation, white, stone, raven. If the premisses are affirmative, terms for the negative relation are white, animal, snow; for the positive relation, white, animal, swan. Evidently then, whenever the premisses are similar in form, and one is universal, the other particular, a syllogism can, not be formed anyhow. Nor is one possible if the middle term belongs to some of each of the extremes, or does not belong to some of either, or belongs to some of the one, not to some of the other, or belongs to neither universally, or is related to them indefinitely. Common terms for all the above are white, animal, man: white, animal, inanimate.

It is clear then from what has been said that if the terms are related to one another in the way stated, a syllogism results of necessity; and if there is a syllogism, the terms must be so related. But it is evident also that all the syllogisms in this figure are imperfect: for all are made perfect by certain supplementary statements, which either are contained in the terms of necessity or are assumed as hypotheses, i.e. when we prove per impossibile. And it is evident that an affirmative conclusion is not attained by means of this figure, but all are negative, whether universal or particular.

6.

But if one term belongs to all, and another to none, of a third, or if both belong to all, or to none, of it, I call such a figure the third; by middle term in it I mean that of which both the predicates are predicated, by extremes I mean the predicates, by the major extreme that which is further from the middle, by the minor that which is nearer to it. The middle term stands outside the extremes, and is last in position. A syllogism cannot be perfect

in this figure either, but it may be valid whether the terms are related universally or not to the middle term.

If they are universal, whenever both P and R belong to S, it follows that P will necessarily belong to some R. For, since the affirmative statement is convertible, S will belong to some R: consequently since P belongs to all S, and S to some R, P must belong to some R: for a syllogism in the first figure is produced. It is possible to demonstrate this also per impossibile and by exposition. For if both P and R belong to all S, should one of the Ss, e.g. N, be taken, both P and R will belong to this, and thus P will belong to some R. If R belongs to all S, and P to no S, there will be a syllogism to prove that P will necessarily not belong to some R. This may be demonstrated in the same way as before by converting the premiss RS. It might be proved also per impossibile, as in the former cases. But if R belongs to no S, P to all S, there will be no syllogism. Terms for the positive relation are animal, horse, man: for the negative relation animal, inanimate, man.

Nor can there be a syllogism when both terms are asserted of no S. Terms for the positive relation are animal, horse, inanimate; for the negative relation man, horse, inanimate-inanimate being the middle term.

It is clear then in this figure also when a syllogism will be possible and when not, if the terms are related universally. For whenever both the terms are affirmative, there will be a syllogism to prove that one extreme belongs to some of the other; but when they are negative, no syllogism will be possible. But when one is negative, the other affirmative, if the major is negative, the minor affirmative, there will be a syllogism to prove that the one extreme does not belong to some of the other: but if the relation is reversed, no syllogism will be possible. If one term is related universally to the middle, the other in part only, when both are affirmative there must be a syllogism, no matter which of the premisses is universal. For if R belongs to all S, P to some S, P must belong to some R. For since the affirmative statement is convertible S will belong to some P: consequently since R belongs to all S, and S to some P, R must also belong to some P: therefore P must belong to some R.

Again if R belongs to some S, and P to all S, P must belong to some R. This may be demonstrated in the same way as the preceding. And it is possible to demonstrate it also per impossibile and by exposition, as in the former cases. But if one term is affirmative, the other negative, and if the affirmative is universal, a syllogism will be possible whenever the minor term is affirmative. For if R belongs to all S, but P does not belong to some S, it is necessary that P does not belong to some R. For if P belongs to all R, and R belongs to all S, then P will belong to all S: but we assumed that it did not. Proof is possible also without reduction ad impossibile, if one of the Ss be taken to which P does not belong.

But whenever the major is affirmative, no syllogism will be possible, e.g. if P belongs to all S and R does not belong to some S. Terms for the universal affirmative relation are animate, man, animal. For the universal negative relation it is not possible to get terms, if R belongs to some S, and does not belong to some S. For if P belongs to all S, and R

to some S, then P will belong to some R: but we assumed that it belongs to no R. We must put the matter as before.' Since the expression 'it does not belong to some' is indefinite, it may be used truly of that also which belongs to none. But if R belongs to no S, no syllogism is possible, as has been shown. Clearly then no syllogism will be possible here.

But if the negative term is universal, whenever the major is negative and the minor affirmative there will be a syllogism. For if P belongs to no S, and R belongs to some S, P will not belong to some R: for we shall have the first figure again, if the premiss RS is converted.

But when the minor is negative, there will be no syllogism. Terms for the positive relation are animal, man, wild: for the negative relation, animal, science, wild-the middle in both being the term wild.

Nor is a syllogism possible when both are stated in the negative, but one is universal, the other particular. When the minor is related universally to the middle, take the terms animal, science, wild; animal, man, wild. When the major is related universally to the middle, take as terms for a negative relation raven, snow, white. For a positive relation terms cannot be found, if R belongs to some S, and does not belong to some S. For if P belongs to all R, and R to some S, then P belongs to some S: but we assumed that it belongs to no S. Our point, then, must be proved from the indefinite nature of the particular statement.

Nor is a syllogism possible anyhow, if each of the extremes belongs to some of the middle or does not belong, or one belongs and the other does not to some of the middle, or one belongs to some of the middle, the other not to all, or if the premisses are indefinite. Common terms for all are animal, man, white: animal, inanimate, white.

It is clear then in this figure also when a syllogism will be possible, and when not; and that if the terms are as stated, a syllogism results of necessity, and if there is a syllogism, the terms must be so related. It is clear also that all the syllogisms in this figure are imperfect (for all are made perfect by certain supplementary assumptions), and that it will not be possible to reach a universal conclusion by means of this figure, whether negative or affirmative.

7.

It is evident also that in all the figures, whenever a proper syllogism does not result, if both the terms are affirmative or negative nothing necessary follows at all, but if one is affirmative, the other negative, and if the negative is stated universally, a syllogism always results relating the minor to the major term, e.g. if A belongs to all or some B, and B belongs to no C: for if the premisses are converted it is necessary that C does not belong to some A. Similarly also in the other figures: a syllogism always results by means of conversion. It is evident also that the substitution of an indefinite for a particular affirmative will effect the same syllogism in all the figures.

It is clear too that all the imperfect syllogisms are made perfect by means of the first figure. For all are brought to a conclusion either ostensively or per impossibile. In both ways the first figure is formed: if they are made perfect ostensively, because (as we saw) all are brought to a conclusion by means of conversion, and conversion produces the first figure: if they are proved per impossibile, because on the assumption of the false statement the syllogism comes about by means of the first figure, e.g. in the last figure, if A and B belong to all C, it follows that A belongs to some B: for if A belonged to no B, and B belongs to all C, A would belong to no C: but (as we stated) it belongs to all C. Similarly also with the rest. It is possible also to reduce all syllogisms to the universal syllogisms in the first figure. Those in the second figure are clearly made perfect by these, though not all in the same way; the universal syllogisms are made perfect by converting the negative premiss, each of the particular syllogisms by reductio ad impossibile. In the first figure particular syllogisms are indeed made perfect by themselves, but it is possible also to prove them by means of the second figure, reducing them ad impossibile, e.g. if A belongs to all B, and B to some C, it follows that A belongs to some C. For if it belonged to no C, and belongs to all B, then B will belong to no C: this we know by means of the second figure. Similarly also demonstration will be possible in the case of the negative. For if A belongs to no B, and B belongs to some C, A will not belong to some C: for if it belonged to all C, and belongs to no B, then B will belong to no C: and this (as we saw) is the middle figure. Consequently, since all syllogisms in the middle figure can be reduced to universal syllogisms in the first figure, and since particular syllogisms in the first figure can be reduced to syllogisms in the middle figure, it is clear that particular syllogisms can be reduced to universal syllogisms in the first figure. Syllogisms in the third figure, if the terms are universal, are directly made perfect by means of those syllogisms; but, when one of the premisses is particular, by means of the particular syllogisms in the first figure: and these (we have seen) may be reduced to the universal syllogisms in the first figure: consequently also the particular syllogisms in the third figure may be so reduced. It is clear then that all syllogisms may be reduced to the universal syllogisms in the first figure. We have stated then how syllogisms which prove that something belongs or does not belong to something else are constituted, both how syllogisms of the same figure are constituted in themselves, and how syllogisms of different figures are related to one another.

Outline

I. Introduction.

- A. We know definitions of syllogism and its parts.
- B. we need to make and identify the syllogism.

II. Perfect and imperfect syllogisms.

- A. Difference between perfect and imperfect syllogisms.
- B. Examples of both perfect and imperfect: triangles and metal books.

III. Principles of syllogism.

- A. Principles of all syllogisms.
 1. First principle of syllogism: said of all.
 2. What "said of all/none" means.
- B. Principles for imperfect syllogisms: rules of conversion.
 1. What conversion is.
 2. Argument for the first rule of conversion.
 3. Argument for the second rule.
 - a. Warning about conversion of universal affirmation.
 4. Third rule briefly.
 5. Fourth rule and instances.

IV. Varieties of perfect syllogisms.

- A. Order of treatment of perfect.
- B. Process in general: all possibilities.
 1. How he shows that they work and do not work.
 - a. An example of one that works.
 - b. An example of one that does not work.
- C. Transition to labeling parts and naming syllogisms. First chart.
 1. Labels of parts applies to Barbara and example of Barbara.
 2. How the names work.
- D. Notion of figure: transition to imperfect syllogisms.

V. Varieties of imperfect syllogisms.

- A. Summary of second chart.
- B. Good and bad in imperfect, how names work.
 1. Shows that some are good by reduction to first figure.
 - a. Reduction of Cesare to Celarent by conversion.
 - b. Reduction by contradiction.
 - (1) Refer to accompanying texts to work about details.

VI. Conclusion: move on to demonstrative syllogism.

Supplementary Text

Introduction

In our last lecture we looked at the definitions of the syllogism and its parts. The syllogism is speech in which from two given statements, called propositions, a third, called the conclusion, follows necessarily. The propositions are made up of terms joined by a "being" verb. The conclusion follows just from the terms of those propositions.

I want to emphasize, however, that the syllogism is a tool in words through which the mind reasons well. Therefore, we need to know more about the syllogism than its definition: we need to know how to make and use good syllogisms. That is the purpose

of this lecture: to make and use good syllogisms. We will make them by using the correct principles, and we will identify the good varieties of it. Therefore, our first task is to look at the principles of the syllogism, our second to look at its varieties.

Principles of the Syllogism

After Aristotle defines the syllogism he divides it, not into two kinds, but into degrees, into the perfect and imperfect. The difference between the perfect and imperfect does not concern necessity: the conclusion follows necessarily from the premisses in both cases. The difference concerns how evident, how obvious, it is that the conclusion follows from the premisses. The perfect syllogism needs no other proposition than the ones given in order to make it clear that the conclusion follows. The imperfect syllogism requires that another proposition be added to make it obvious that the conclusion follows from the premisses.

For example, in the syllogism "all triangles have three sides, all three-sided figures have 180 degrees, therefore all triangles have 180 degrees" it is obvious that the conclusion follows necessarily. But I can give another syllogism, "no book is metal, all coins are metal, therefore no book is a coin," in which it is not obvious that the conclusion follows. The conclusion does follow necessarily, but it is hard to see that it does. To see that it does follow, we need to add another statement, "no metal thing is a book."

If you are alert, you will object, remembering from the definition of the syllogism that the conclusion follows from the premisses without the addition of any other premiss or term. Aristotle would reply that the added premiss is not necessary for the conclusion to follow, it is added to make it clear that the conclusion follows. The added premiss comes from the original premisses, and contributes nothing new to the terms of the argument. In our example, the added premiss, "no metal thing is a book" added no new terms, and it follows from the original premiss, "no book is metal." It merely clarifies that the conclusion follows. Still, since a syllogism is supposed to make us see that the conclusion follows, the need to clarify indicates that this syllogism is imperfect.

Aristotle next discusses the principles of the syllogism. First, he discusses the principles of all syllogisms, and second, he discusses additional principles which are helpful only for the imperfect syllogism. This is how Aristotle explains the first:

We say that one term is predicated of all of another, whenever no instance of the subject can be found of which the other term cannot also be asserted. To be predicated of none must be understood in the same way.

Aristotle is saying that the two principles of syllogisms are the meanings of the phrases "said of all" and "said of none." We should first ask ourselves what these phrases mean, and then how they are the principles of all syllogisms.

We can best explain by giving an example. We saw before that the phrase, "white is said of man" means that white is predicated of man. This occurs in the statement "man is white." White is said of all men when the subject "man" is used universally in the

resulting statement, "all men are white." Thus, the phrase "said of all" indicates the predicate is attributed to the subject universally, and not in virtue of a part. In a parallel way, the phrase "said of none" means that the predicate is denied of the subject universally: for example, that no man is white.

Furthermore, the universal affirmation and denial are principles of every syllogism because a syllogism works only when at least one premiss is universal. It will become obvious why this is so later, when we look at the particular useful varieties of the syllogism. But it is already clear that if we do not understand what universal statements mean, or if we misunderstand what they mean, then we will necessarily misunderstand the syllogism, both perfect and imperfect.

Digression on the Order of Logical Doctrine

This leads me to an important digression on the order of Aristotle's logic. Aristotle begins his logic with a study of simple expressions, moves on to statements, and discusses discursive reasoning last in order. At first, there seems nothing odd about this proceeding, but an examination of the history of logic affords this curious observation: only Aristotle and his disciples follow this order. Other logicians, both ancient and modern, start with the logic of the third operation, and work their way back to that of the second and the first. It is very fruitful for a deeper comprehension of logic to investigate the causes of the difference.

It seems that this is the way the other logicians thought. Logic is most obviously about discursive reasoning because discursive reasoning is what most obviously needs the guidance of an art. But in order to complete the study of discursive reasoning, you need to give an account of its parts, the proposition and the term. Therefore, logic in a secondary way studies also the proposition and the term, but these only when and insofar as they are needed to illuminate discursive reasoning.

The genius of Aristotle lies in recognizing the distinction between the order in which we come to see what a science is about and the order in which the science must be studied. He gives the classic example of this in his *Metaphysics*. Now the *Metaphysics* is a philosophical book of wisdom, and therefore Aristotle asks at the very beginning what wisdom is about. He finds that wisdom is most obviously about the First Causes of all being. Yet it is also clear that wisdom is not just about the First Causes, because it is about the First Causes as principles of all being. Therefore, wisdom must also be about being as being. And since wisdom must study everything that follows from being as being, it must also study the first statements of all knowledge, the axioms. So wisdom is about three things: most obviously it is about First Causes; less obviously it is about being as being; and least obviously it is about the axioms.

But the First Causes are the hardest things to understand, while we can only understand being as being by applying the first principles of all knowledge, the axioms, to it. That is, the most knowable things are the axioms, then being as being, and the First Causes are the least knowable to us. We come to see what wisdom is about in this order: first, the First causes; then, being as being; and finally, the axioms. But the

science itself considers these subjects in the opposite order: first, it considers the axioms, then being as being, and last of all the first causes. The order in which we uncover the subject of a science is not necessarily the order in which we study the science.

The same kind of thing happens in logic. It is most obvious that logic is about discursive reasoning, but we can use this to discover that logic must also be about statements. And if it is about statements, then it must also be about the simple terms which make up statements. Thus, the order in which we uncover the subject of logic is: syllogism, statement, simple expression. But, Aristotle implicitly contends, the logic of the syllogism cannot be understood well unless the logic of the statement has been completely understood. And the logic of the statement cannot be understood without understanding the logic of the simple expression. Therefore, the order in which we study logic should be: simple term, statement, and syllogism. The order reverses in the same way as that of metaphysics.

Aristotle confirms this analysis in a passage from his *Metaphysics*. There he commends Socrates as the founder of logic, writing:

Socrates was occupying himself with the excellences of character, and in connexion with them became the first to raise the problem of universal definition. . . . it was natural that Socrates should be seeking the essence, for he was seeking to syllogize, and 'what a thing is' is the starting-point of syllogisms.

We can say that Socrates was the real founder of logic. He wanted to make syllogisms about ethical matters, but he realized he could not do that unless he knew the definitions of the virtues. Thus, in trying to define the virtues he was the first to investigate the means of defining the universal term. What is clear from this passage is that Aristotle sees the logic of the first operation, which makes a definition, as being prior in the order of learning to the logic of the third operation, which makes a syllogism.

We could approach the same conclusion from another angle. Aristotle makes our understanding of the phrases "said of all" and "said of none" to be principles of understanding the syllogism. Those phrases hearken back to the universal statements, of course, but these latter cannot be understood without a prior understanding of the universal term as described in the *Isogoge* and the *Categories*. St. Albert the Great, St. Thomas' teacher, therefore concludes that everything in logic must be able to be traced back to a correct understanding of the universal term. Thus, the logic of the first operation is fundamental for a correct understanding of the later parts of logic.

A glance at what happens when the opposite approach is taken makes clear the necessity of following the proper order. Most modern logic texts begin by looking at discursive reasoning. Since their authors failed to start with the universal, they have a hard time seeing that "said of all" and "said of none" are the fundamental principles of syllogizing. Thus, their books try to account for reasoning without using those principles. They consequently reduce reasoning to a kind of accounting, an adding and subtracting of symbols. Then when they go back to consider the logic of the simple term, they

always reduce the universal to a collection of individuals. Perhaps we should say this: after reducing reasoning to the manipulation of symbols, the only consistent account they can give of the universal is as a collection. "Dog" becomes, not a name which is predicable of many having the same nature, but a symbol we use to collect many things regardless of their nature. They begin with an ignorance of the universal, but they end by denying it. The lesson we can learn from them is this: to learn logic in a different order than that of Aristotle is to tend toward the corruption of logic. We might even say that Aristotle's most important contribution to the art of logic was not determining many individual logical rules, but teaching us logic in its proper order.

Return to Discussion of Principles of the Syllogism

We said that "said of all" and "said of none" are the principles of all syllogisms, but the imperfect syllogisms need more principles in order to make their utility obvious. Those principles are the rules for the conversion of propositions, and those rules are the subject of our next discussion.

To convert a proposition is to switch the subject and the predicate of it. For example, the conversion of the proposition "no book is metal" is "no metal thing is a book." Before we look at the rules for conversion, I should explain why Aristotle discusses the conversion of propositions here, rather than in the previous book, *Peri Hermeneias*. There are two reasons. First, he discusses conversions here because it is a principle for seeing the imperfect syllogism, and the syllogism is the main subject of the *Prior Analytics*. More importantly, he discusses conversion here because you cannot discuss it before. Only propositions, which are parts of syllogisms, can be converted. Statements cannot be converted.

Remember, the proposition and statement are not the same. The proposition is the statement that is part of a syllogism. Because of this difference, the statement and the proposition are broken down into parts in different ways. The statement has the parts that are necessary to signify the true and the false, which are the noun and verb. Since the verb must always be the predicate, the parts of a statement cannot be switched or converted. The noun must always be the subject of a statement, and the verb the predicate. But the proposition is broken into three parts, two terms and the "being" word. Each term, because neither is in itself a verb, can be both a subject and a predicate. In our sample syllogism, the term "three-sided figure" is part of two propositions, and it is the subject of one and the predicate of the other. Thus, unlike the noun and verb, the two terms of a proposition can be switched. Aristotle, then, is right to discuss the rules for that switching, the rules of conversion, when he discusses the principles of the syllogism.

There are four rules for the conversion of ordinary propositions, one for each kind of proposition. The first rule is for the universal denial. If it is true that no B is A, it will also be true that no A is B. In our example above, if no book is metal, then no metal thing is a book.

The second rule concerns the universal affirmation. If every B is A, then by conversion some A is B. For example, if every man is an animal, then some animals are men. Notice that the universal affirmation only converts to a particular affirmation, not to another universal affirmation. That this is so is clear through our example: since all men are animals, it is clear that some animals must also be men, but we also know that not all animals are men.

The third rule is the conversion of the particular affirmation: if some B is A, then some A is B. For example, if some men are tan, then some tan things are men.

The last rule concerns the particular denial: the particular denial does not convert. If the particular denial converted, it would convert into another particular denial. Yet in fact, there are many cases in which the original particular denial is true, yet the attempted conversion into another particular denial is false. For example, it is true that some animals are not men, but it is not true that some men are not animals. In sum, the universal denial converts into a universal denial, the universal affirmation converts into a particular affirmation, as does the particular affirmation, but the particular denial cannot be converted. The rules are summarized in the charts which accompany this lesson.

The phrases, "said of all" and "said of none," and the rules of conversion are all the principles of the syllogism. Thus, we are ready to look at the varieties of syllogisms. Aristotle first discusses the perfect syllogisms, and then the imperfect ones. Aristotle identifies four perfect syllogisms, which the scholastics call the four moods of the perfect syllogism. First we are going to look at the process that Aristotle uses to discover those perfect syllogisms, then we are going to look at the results of that process, and finally we are going to find and label the parts of the resulting syllogisms.

Varieties of the Syllogism

Every syllogism is made of two propositions and will produce one main conclusion. Those two propositions come in four varieties, the four kinds of propositions. Therefore, there are going to be sixteen possibilities for perfect syllogisms. Aristotle goes through all sixteen, and finds that only four are syllogisms, that is, that only four combinations of premisses directly result in necessary conclusions.

He shows that these four work by relating them back to the principles of the syllogism, the "said of all" and "said of none." He shows that the other twelve do not work by showing that the truth of both premisses is compatible with the truth of contradictory conclusions. Since a syllogism which could have contradictory conclusions would be useless, it follows that these are bad syllogisms, or rather, that they are not syllogisms at all.

Let us look at two examples, one of a good syllogism, the other of a bad one. Aristotle writes:

If A is predicated of all B, and B of all C, A must be predicated of all C: we have already explained what we mean by predicated of all.

That is, when we are given the first proposition, A is said of all B, we know that this means that A belongs to everything that B belongs to. But the next proposition tells us that B belongs to every C. Therefore, by the meaning of the phrase "said of all," it is obvious that A also belongs to every C. For example, if every three-sided figure has 180 degrees, and every triangle has three sides, then just by the meaning of "said of all" it is clear that every triangle has 180 degrees. This is a concrete example of a perfect syllogism.

On the other hand, Aristotle gives the following example of a combination of premisses which does not yield a syllogism, or what later logicians will call an invalid syllogism. Aristotle writes:

If the first term belongs to the middle, but the middle to none of the last, there will be no syllogism between the extremes. . . . As an example of a universal affirmative relation, between the extremes we may take the terms animal, man, and horse; of the universal negative relation, the terms animal, man, stone.

That is, nothing necessarily follows if the attempted syllogism has the following premisses: every B is A and no C is B. That is because, granted that the premisses are true, it is possible for opposite conclusions to be true. Take Aristotle's example: the two premisses no stone is a man and every man is an animal are true and compatible with a universally negative conclusion, no stone is an animal. Yet if we use just one different term, but the same kind of premisses, they are true and yet compatible with the truth of a conclusion which has the contrary character: no horse is a man, and every man is an animal, but it is not true that no horse is an animal. On the contrary, every horse is an animal. Thus, this possible arrangement of premisses does not yield a true syllogism, one in which some definite kind of conclusion necessarily follows.

Chart 5

We are going to skip the rest of the details. The results of Aristotle's inquiry is summarized in Chart #5. Notice that each mood of the perfect syllogism has been given a name. This name is a mnemonic device invented by the medieval logicians which identifies the premisses and conclusion of each mood. With this chart we are going to do two things: we will label the parts and structure of the perfect syllogisms and we will explain the mnemonic devices.

Chart 4

Take the first mood, **Barbara**. It has two propositions, one conclusion, but only three terms. Each term is used twice. The term that is used in both premisses, B, is called the middle term. It is also the case that the middle term is the subject in one premiss, the predicate in the other. The term which is predicated of the middle term, C, is called the major term because what is predicated has more the nature of the universal than what is subject. And major means greater, more universal. The term which the middle is predicated of, A, is therefore called the minor term, the lesser term. In the conclusion, the major term A is always predicated of the minor term C. The proposition with the

major term in it is called the major premiss, and that with the minor term in it is called the minor premiss. In the example given in Chart #4, the middle term is "three-sided figure," the major term "has 180 degrees," the minor term "triangle." The major premiss is "every three-sided figure has 180 degrees," the minor premiss "every triangle is three-sided."

The names of the syllogisms work as follows: each vowel represents the quantity and quality of a proposition, the first vowel standing for the major premiss, the second vowel for the minor premiss, and the third vowel for the conclusion. The vowels are assigned as we assigned them before in our discussion of statements. Thus, A is the universal affirmation, E the universal denial, I the particular affirmation, and O the particular denial. The first consonant is taken alphabetically, skipping vowels: the first mood begins with B, the second with C the third with D, and the fourth with F. For example, **Barbara** is a syllogism in which both premisses and also the conclusion are universal affirmations. In **Ferio**, on the other hand, the major premiss is a universal denial, the minor premiss is a particular affirmation, and the conclusion is a particular denial. The other names work in the same way.

One more thing to remember about the perfect syllogism: the middle term, B, is the predicate in one proposition, and the subject in another. Aristotle calls the position of the middle term the "figure" of the syllogism. He calls the perfect syllogisms first figure syllogisms because the middle term is always subject of the major term, and predicate of the minor term in perfect syllogisms. In the imperfect syllogisms the middle term will have a different position. In fact, the reason that the other syllogisms are imperfect is that the middle term has a different positions in them.

Chart 6

Aristotle divides the imperfect syllogisms into two figures, and so we have a total of three figures for the syllogism, as seen on Chart #6. In the first figure, the middle term is subject in one premiss, predicate in the other. In the second figure, the middle term is predicate in both premisses. In the third figure, the middle term is the subject in both premisses. These are all of the possible figures, and Aristotle finds that there are four valid moods in the first figure, four in the second, and six in the third, making a total of fourteen valid syllogisms.

Chart 7

We are going to skip the details of these moods, which are given in Chart #7. I want to finish today's discussion with two topics: the way in which Aristotle sorts out the good from the bad in the imperfect syllogisms; and the way we can use the mnemonic devices of the names in the second and third figures.

In the first figure, he showed that certain syllogisms do work by appealing to the principles "said of all" and "said of none." He cannot do that with the second and third figures, because they are imperfect. Those principles are necessary, but not sufficient, for them. So he uses the other principles, the rules for conversion, to show that the

good syllogisms in the second and third figures work. That is, he most often shows that second and third figure syllogisms work by converting one or more of their propositions to show that they are equivalent to syllogisms in the first figure.

The syllogism called **Celarent** is in the first figure. An example of it would be "no metal thing is a book, all coins are metal, therefore, no coin is a book." Now the syllogism called **Cesare** is in the second figure. An example of it would be "no book is metal, all coins are metal, therefore no coin is a book," which is the example given in Chart #4. The difference between the two syllogisms is in one proposition, "no metal thing is a book" as compared to "no book is metal." But by the rules of conversion we know that the second proposition is equivalent to the first: "no book is metal" converts into "no metal thing is a book." Thus, the second figure **Cesare** is shown to be a syllogism by making it equivalent to, or reducing it to, the first figure **Celarent**. The accompanying charts go over the reductions of all imperfect syllogisms in detail.

A couple of syllogisms cannot be reduced to the first figure by conversion. They are reduced, however, by a process called "reduction by contradiction." That is, Aristotle shows that two syllogisms, one each in the second and third figure, must work because, if they do not, one in the first figure, **Barbara**, would then also not work. We are going to examine **Baroco**, a syllogism of the second figure.

If "every A is B" is true, and "some C is not B" is true, then it is necessary that "some C is not A." For, if that conclusion did not follow, then sometimes its contradictory, "all C is A," would be true. Suppose that this happened once. Then, it would be true that "all C is A," and it would also be true that "all A is B." From these, by **Barbara**, it would follow that "all C is B." That cannot happen, since we are given that it is true that "some C is not B," which is the contradictory of "all C is B." Thus, the conclusion "some C is not A" must follow.

We do not want to worry about memorizing all the details. For our purposes it is enough to be able to work these problems when we need to. That is what the mnemonic devices, the names, help us to do. They show us how second and third figure syllogisms are in some way reduced to those of the first figure. Thus, if we know the first figure, and we know how to reduce other syllogisms, then we are in the position to evaluate every proposed syllogism in the way that Aristotle did. The charts which accompany this lesson explain the details of the system.

Conclusion

That concludes our discussion of the intricacies of the syllogism. The syllogism is the main subject of the first part of the judging part of logic, so we are now ready to move on to the second part of judging logic, a consideration of the demonstrative syllogism.

Chart of the Three Figures of the Syllogism

FIRST FIGURE: Barbara

Every B is A Every C is B Every C is A2. Celarent

No B is A Every C is B No C is A3. Darii
 Every B is A Some C is B Some C is A4. Ferio
 No B is A Some C is B Some C is not A

SECOND FIGURE: Cesare

No A is B Every C is B No C is A Camestres
 Every A is B No C is B No C is A Festino
 No A is B Some C is B Some C is not A Baroco
 Every A is B Some C is not B Some C is not A

THIRD FIGURE: Darapti

Every B is A Every B is C Some C is A Felapton
 No B is A Every B is C Some C is not A Disamis
 Some B is A Every B is C Some C is A Datisi
 Every B is A Some B is C Some C is A Bocardo
 Some B is not A Every B is C Some C is not A Ferison
 No B is A Some B is C Some C is not A

Reducing imperfect syllogisms to perfect syllogisms

The following is a chart which explains how the names of the imperfect syllogisms can help us reduce them to perfect syllogisms. Each letter in a name has the following meaning:

B = syllogism reduces to Barbara.
 C = (if the first letter) syllogism reduces to Celarent.
 D = syllogism reduces to Darii.
 F = syllogism reduces to Ferio.
 s or p = the preceding premiss is converted.
 m = the order of premisses is reversed.
 c = (if not the first letter) syllogism reduces by contradiction.

Examples of reductions:

I.

Cesare

No car is wooden. [No A is B.]
 Every wagon is wooden. [Every C is B.]
 Therefore, no wagon is a car. [Therefore, no C is A.]

C = reduce to Celarent, s = convert the premiss before it (in this case the major premiss, "No car is wooden," is converted into "No wooden thing is a car").

Celarent

Thus, no wooden thing is a car. [No B is A.]
 Every wagon is wooden. [Every C is B.]
 Therefore, not wagon is a car. [Therefore, no C is A.]

II.

Disamis.

Some cars are metal. [Some B is A.]

Every car is a vehicle. [Every B is C.]

Therefore, some vehicle is metal. [Some C is A.]

D = reduce to Darii, the first s = convert the previous premiss ("Some cars are metal" becomes "Some metal things are cars"), m = switch the premisses, the second s = convert the conclusion ("some vehicle is metal" becomes "some metal thing is a vehicle")

Darii

Every car is a vehicle. [Every B is A.]

Some metal things are cars. [Some C is B.]

Therefore, some metal thing is a vehicle. [Some C is A.]

III.

Reduction by contradiction. The form of argument is reduction to the absurd. Reduction to the absurd is the form of argument which shows that something is true by arguing that its denial leads to an absurdity. If we want to show by reduction by contradiction that a proposed syllogism is valid, we assume that it is invalid and show that this assumption leads to an absurdity. That is, we assume that the premisses of the syllogism are true, and yet the contradictory of the conclusion is true. This leads to an absurdity through a Barbara syllogism.

Baroco

Every A is B.

Some C is not B.

Therefore, some C is not A.

Suppose that this conclusion did not follow. Then it would be possible that:

Every A is B.

Some C is not B.

And every C is yet A. (This is the contradictory of "Some C is not A.")

But if:

Every A is B.

And every C is A.

Then it follows by Barbara that every C is B. But then we have an absurdity because contradictory statements are both true, namely, every C is B (as concluded here) and Some C is not B (which is one of the premisses in the original syllogism). Thus, assuming the contradictory of the conclusion leads to an absurdity. Therefore, the

original conclusion follows necessarily from the premisses of Baroco. The syllogism Baroco must be valid.

Exercises

Exercise 1: Identify the parts of the following syllogisms, the conclusion and premisses, the middle, major, and minor terms, and the major and minor premisses. (Note: although the chart always places the major premiss first, in real syllogisms it often is placed second.)

Every self-mover determines its own motion.
 Every animal is a self-mover.
 Therefore, every animal determines its own motion.

Every induction is a tool of discursive reasoning.
 Every tool of discursive reasoning has a likeness to the syllogism.
 Therefore, every induction has a likeness to a syllogism.

No symbol is used in Aristotelian logic.
 Every symbol is a sign.
 Therefore, some signs are not used in Aristotelian logic.

Exercise 2: Assign the proper conclusion to the following syllogisms. If no conclusion can be drawn, mark the syllogism as invalid. Then state the figure and mood of the syllogism.

1. No first movers are self-movers.
 But every animal is a self-mover.
2. Every quadrilateral has angles equaling 360 degrees.
 Every square, however, is a quadrilateral.
3. No self-movers are first movers.
 But every animal is a self-mover.
4. Every science is both syllogistic and certain.
5. Every virtue is honorable, and some virtues are also good qualities of intellect.

Exercise 3: Reduce every imperfect syllogism to a perfect one.

Lesson 9: Demonstration

Readings

Posterior Analytics (I.1-2, 13, II.19)

by Aristotle, translated by G. R. G. Mure

Book I

1.

ALL instruction given or received by way of argument proceeds from pre-existent knowledge. This becomes evident upon a survey of all the species of such instruction. The mathematical sciences and all other speculative disciplines are acquired in this way, and so are the two forms of dialectical reasoning, syllogistic and inductive; for each of these latter make use of old knowledge to impart new, the syllogism assuming an audience that accepts its premisses, induction exhibiting the universal as implicit in the clearly known particular. Again, the persuasion exerted by rhetorical arguments is in principle the same, since they use either example, a kind of induction, or enthymeme, a form of syllogism.

The pre-existent knowledge required is of two kinds. In some cases admission of the fact must be assumed, in others comprehension of the meaning of the term used, and sometimes both assumptions are essential. Thus, we assume that every predicate can be either truly affirmed or truly denied of any subject, and that 'triangle' means so and so; as regards 'unit' we have to make the double assumption of the meaning of the word and the existence of the thing. The reason is that these several objects are not equally obvious to us. Recognition of a truth may in some cases contain as factors both previous knowledge and also knowledge acquired simultaneously with that recognition-knowledge, this latter, of the particulars actually falling under the universal and therein already virtually known. For example, the student knew beforehand that the angles of every triangle are equal to two right angles; but it was only at the actual moment at which he was being led on to recognize this as true in the instance before him that he came to know 'this figure inscribed in the semicircle' to be a triangle. For some things (viz. the singulars finally reached which are not predicable of anything else as subject) are only learnt in this way, i.e. there is here no recognition through a middle of a minor term as subject to a major. Before he was led on to recognition or before he actually drew a conclusion, we should perhaps say that in a manner he knew, in a manner not.

If he did not in an unqualified sense of the term know the existence of this triangle, how could he know without qualification that its angles were equal to two right angles? No: clearly he knows not without qualification but only in the sense that he knows universally. If this distinction is not drawn, we are faced with the dilemma in the Meno: either a man will learn nothing or what he already knows; for we cannot accept the solution which some people offer. A man is asked, 'Do you, or do you not, know that every pair is even?' He says he does know it. The questioner then produces a particular pair, of the existence, and so a fortiori of the evenness, of which he was unaware. The solution which some people offer is to assert that they do not know that every pair is

even, but only that everything which they know to be a pair is even: yet what they know to be even is that of which they have demonstrated evenness, i.e. what they made the subject of their premiss, viz. not merely every triangle or number which they know to be such, but any and every number or triangle without reservation. For no premiss is ever couched in the form 'every number which you know to be such', or 'every rectilinear figure which you know to be such': the predicate is always construed as applicable to any and every instance of the thing. On the other hand, I imagine there is nothing to prevent a man in one sense knowing what he is learning, in another not knowing it. The strange thing would be, not if in some sense he knew what he was learning, but if he were to know it in that precise sense and manner in which he was learning it.

2.

We suppose ourselves to possess unqualified scientific knowledge of a thing, as opposed to knowing it in the accidental way in which the sophist knows, when we think that we know the cause on which the fact depends, as the cause of that fact and of no other, and, further, that the fact could not be other than it is. Now that scientific knowing is something of this sort is evident-witness both those who falsely claim it and those who actually possess it, since the former merely imagine themselves to be, while the latter are also actually, in the condition described. Consequently the proper object of unqualified scientific knowledge is something which cannot be other than it is.

There may be another manner of knowing as well-that will be discussed later. What I now assert is that at all events we do know by demonstration. By demonstration I mean a syllogism productive of scientific knowledge, a syllogism, that is, the grasp of which is eo ipso such knowledge. Assuming then that my thesis as to the nature of scientific knowing is correct, the premisses of demonstrated knowledge must be true, primary, immediate, better known than and prior to the conclusion, which is further related to them as effect to cause. Unless these conditions are satisfied, the basic truths will not be 'appropriate' to the conclusion. Syllogism there may indeed be without these conditions, but such syllogism, not being productive of scientific knowledge, will not be demonstration. The premisses must be true: for that which is non-existent cannot be known-we cannot know, e.g. that the diagonal of a square is commensurate with its side. The premisses must be primary and indemonstrable; otherwise they will require demonstration in order to be known, since to have knowledge, if it be not accidental knowledge, of things which are demonstrable, means precisely to have a demonstration of them. The premisses must be the causes of the conclusion, better known than it, and prior to it; its causes, since we possess scientific knowledge of a thing only when we know its cause; prior, in order to be causes; antecedently known, this antecedent knowledge being not our mere understanding of the meaning, but knowledge of the fact as well. Now 'prior' and 'better known' are ambiguous terms, for there is a difference between what is prior and better known in the order of being and what is prior and better known to man. I mean that objects nearer to sense are prior and better known to man; objects without qualification prior and better known are those further from sense. Now the most universal causes are furthest from sense and particular causes are nearest to sense, and they are thus exactly opposed to one another. In saying that the premisses

of demonstrated knowledge must be primary, I mean that they must be the 'appropriate' basic truths, for I identify primary premiss and basic truth. A 'basic truth' in a demonstration is an immediate proposition. An immediate proposition is one which has no other proposition prior to it. A proposition is either part of an enunciation, i.e. it predicates a single attribute of a single subject. If a proposition is dialectical, it assumes either part indifferently; if it is demonstrative, it lays down one part to the definite exclusion of the other because that part is true. The term 'enunciation' denotes either part of a contradiction indifferently. A contradiction is an opposition which of its own nature excludes a middle. The part of a contradiction which conjoins a predicate with a subject is an affirmation; the part disjoining them is a negation. I call an immediate basic truth of syllogism a 'thesis' when, though it is not susceptible of proof by the teacher, yet ignorance of it does not constitute a total bar to progress on the part of the pupil: one which the pupil must know if he is to learn anything whatever is an axiom. I call it an axiom because there are such truths and we give them the name of axioms par excellence. If a thesis assumes one part or the other of an enunciation, i.e. asserts either the existence or the non-existence of a subject, it is a hypothesis; if it does not so assert, it is a definition. Definition is a 'thesis' or a 'laying something down', since the arithmetician lays it down that to be a unit is to be quantitatively indivisible; but it is not a hypothesis, for to define what a unit is is not the same as to affirm its existence.

Now since the required ground of our knowledge-i.e. of our conviction-of a fact is the possession of such a syllogism as we call demonstration, and the ground of the syllogism is the facts constituting its premisses, we must not only know the primary premisses-some if not all of them-beforehand, but know them better than the conclusion: for the cause of an attribute's inherence in a subject always itself inheres in the subject more firmly than that attribute; e.g. the cause of our loving anything is dearer to us than the object of our love. So since the primary premisses are the cause of our knowledge-i.e. of our conviction-it follows that we know them better-that is, are more convinced of them-than their consequences, precisely because of our knowledge of the latter is the effect of our knowledge of the premisses. Now a man cannot believe in anything more than in the things he knows, unless he has either actual knowledge of it or something better than actual knowledge. But we are faced with this paradox if a student whose belief rests on demonstration has not prior knowledge; a man must believe in some, if not in all, of the basic truths more than in the conclusion. Moreover, if a man sets out to acquire the scientific knowledge that comes through demonstration, he must not only have a better knowledge of the basic truths and a firmer conviction of them than of the connexion which is being demonstrated: more than this, nothing must be more certain or better known to him than these basic truths in their character as contradicting the fundamental premisses which lead to the opposed and erroneous conclusion. For indeed the conviction of pure science must be unshakable.

13.

Knowledge of the fact differs from knowledge of the reasoned fact. To begin with, they differ within the same science and in two ways: (1) when the premisses of the syllogism are not immediate (for then the proximate cause is not contained in them-a necessary

condition of knowledge of the reasoned fact): (2) when the premisses are immediate, but instead of the cause the better known of the two reciprocals is taken as the middle; for of two reciprocally predicable terms the one which is not the cause may quite easily be the better known and so become the middle term of the demonstration. Thus (2) (a) you might prove as follows that the planets are near because they do not twinkle: let C be the planets, B not twinkling, A proximity. Then B is predicable of C; for the planets do not twinkle. But A is also predicable of B, since that which does not twinkle is near--we must take this truth as having been reached by induction or sense-perception.

Therefore A is a necessary predicate of C; so that we have demonstrated that the planets are near. This syllogism, then, proves not the reasoned fact but only the fact; since they are not near because they do not twinkle, but, because they are near, do not twinkle. The major and middle of the proof, however, may be reversed, and then the demonstration will be of the reasoned fact. Thus: let C be the planets, B proximity, A not twinkling. Then B is an attribute of C, and A-not twinkling-of B. Consequently A is predicable of C, and the syllogism proves the reasoned fact, since its middle term is the proximate cause. Another example is the inference that the moon is spherical from its manner of waxing. Thus: since that which so waxes is spherical, and since the moon so waxes, clearly the moon is spherical. Put in this form, the syllogism turns out to be proof of the fact, but if the middle and major be reversed it is proof of the reasoned fact; since the moon is not spherical because it waxes in a certain manner, but waxes in such a manner because it is spherical. (Let C be the moon, B spherical, and A waxing.) Again (b), in cases where the cause and the effect are not reciprocal and the effect is the better known, the fact is demonstrated but not the reasoned fact. This also occurs (1) when the middle falls outside the major and minor, for here too the strict cause is not given, and so the demonstration is of the fact, not of the reasoned fact. For example, the question 'Why does not a wall breathe?' might be answered, 'Because it is not an animal'; but that answer would not give the strict cause, because if not being an animal causes the absence of respiration, then being an animal should be the cause of respiration, according to the rule that if the negation of causes the non-inherence of y, the affirmation of x causes the inherence of y; e.g. if the disproportion of the hot and cold elements is the cause of ill health, their proportion is the cause of health; and conversely, if the assertion of x causes the inherence of y, the negation of x must cause y's non-inherence. But in the case given this consequence does not result; for not every animal breathes. A syllogism with this kind of cause takes place in the second figure. Thus: let A be animal, B respiration, C wall. Then A is predicable of all B (for all that breathes is animal), but of no C; and consequently B is predicable of no C; that is, the wall does not breathe. Such causes are like far-fetched explanations, which precisely consist in making the cause too remote, as in Anacharsis' account of why the Scythians have no flute-players; namely because they have no vines.

Thus, then, do the syllogism of the fact and the syllogism of the reasoned fact differ within one science and according to the position of the middle terms. But there is another way too in which the fact and the reasoned fact differ, and that is when they are investigated respectively by different sciences. This occurs in the case of problems related to one another as subordinate and superior, as when optical problems are subordinated to geometry, mechanical problems to stereometry, harmonic problems to

arithmetic, the data of observation to astronomy. (Some of these sciences bear almost the same name; e.g. mathematical and nautical astronomy, mathematical and acoustical harmonics.) Here it is the business of the empirical observers to know the fact, of the mathematicians to know the reasoned fact; for the latter are in possession of the demonstrations giving the causes, and are often ignorant of the fact: just as we have often a clear insight into a universal, but through lack of observation are ignorant of some of its particular instances. These connexions have a perceptible existence though they are manifestations of forms. For the mathematical sciences concern forms: they do not demonstrate properties of a substratum, since, even though the geometrical subjects are predicable as properties of a perceptible substratum, it is not as thus predicable that the mathematician demonstrates properties of them. As optics is related to geometry, so another science is related to optics, namely the theory of the rainbow. Here knowledge of the fact is within the province of the natural philosopher, knowledge of the reasoned fact within that of the optician, either qua optician or qua mathematical optician. Many sciences not standing in this mutual relation enter into it at points; e.g. medicine and geometry: it is the physician's business to know that circular wounds heal more slowly, the geometer's to know the reason why.

Book II

19.

As regards syllogism and demonstration, the definition of, and the conditions required to produce each of them, are now clear, and with that also the definition of, and the conditions required to produce, demonstrative knowledge, since it is the same as demonstration. As to the basic premisses, how they become known and what is the developed state of knowledge of them is made clear by raising some preliminary problems.

We have already said that scientific knowledge through demonstration is impossible unless a man knows the primary immediate premisses. But there are questions which might be raised in respect of the apprehension of these immediate premisses: one might not only ask whether it is of the same kind as the apprehension of the conclusions, but also whether there is or is not scientific knowledge of both; or scientific knowledge of the latter, and of the former a different kind of knowledge; and, further, whether the developed states of knowledge are not innate but come to be in us, or are innate but at first unnoticed. Now it is strange if we possess them from birth; for it means that we possess apprehensions more accurate than demonstration and fail to notice them. If on the other hand we acquire them and do not previously possess them, how could we apprehend and learn without a basis of pre-existent knowledge? For that is impossible, as we used to find in the case of demonstration. So it emerges that neither can we possess them from birth, nor can they come to be in us if we are without knowledge of them to the extent of having no such developed state at all. Therefore we must possess a capacity of some sort, but not such as to rank higher in accuracy than these developed states. And this at least is an obvious characteristic of all animals, for they possess a congenital discriminative capacity which is called sense-perception. But

though sense-perception is innate in all animals, in some the sense-impression comes to persist, in others it does not. So animals in which this persistence does not come to be have either no knowledge at all outside the act of perceiving, or no knowledge of objects of which no impression persists; animals in which it does come into being have perception and can continue to retain the sense-impression in the soul: and when such persistence is frequently repeated a further distinction at once arises between those which out of the persistence of such sense-impressions develop a power of systematizing them and those which do not. So out of sense-perception comes to be what we call memory, and out of frequently repeated memories of the same thing develops experience; for a number of memories constitute a single experience. From experience again-i.e. from the universal now stabilized in its entirety within the soul, the one beside the many which is a single identity within them all-originate the skill of the craftsman and the knowledge of the man of science, skill in the sphere of coming to be and science in the sphere of being. We conclude that these states of knowledge are neither innate in a determinate form, nor developed from other higher states of knowledge, but from sense-perception. It is like a rout in battle stopped by first one man making a stand and then another, until the original formation has been restored. The soul is so constituted as to be capable of this process.

Let us now restate the account given already, though with insufficient clearness. When one of a number of logically indiscriminable particulars has made a stand, the earliest universal is present in the soul: for though the act of sense-perception is of the particular, its content is universal-is man, for example, not the man Callias. A fresh stand is made among these rudimentary universals, and the process does not cease until the indivisible concepts, the true universals, are established: e.g. such and such a species of animal is a step towards the genus animal, which by the same process is a step towards a further generalization.

Thus it is clear that we must get to know the primary premisses by induction; for the method by which even sense-perception implants the universal is inductive. Now of the thinking states by which we grasp truth, some are unfailingly true, others admit of error-opinion, for instance, and calculation, whereas scientific knowing and intuition are always true: further, no other kind of thought except intuition is more accurate than scientific knowledge, whereas primary premisses are more knowable than demonstrations, and all scientific knowledge is discursive. From these considerations it follows that there will be no scientific knowledge of the primary premisses, and since except intuition nothing can be truer than scientific knowledge, it will be intuition that apprehends the primary premisses-a result which also follows from the fact that demonstration cannot be the originative source of demonstration, nor, consequently, scientific knowledge of scientific knowledge. If, therefore, it is the only other kind of true thinking except scientific knowing, intuition will be the originative source of scientific knowledge. And the originative source of science grasps the original basic premiss, while science as a whole is similarly related as originative source to the whole body of fact.

Outline

- I. Introduction: we need tool which gives absolute certainty, demonstration.
- II. Problem of learning.
 - A. Problem of learning mentioned.
 - B. Problem of learning explained.
 - C. Syllogism solves the problem.
 1. Transition to demonstration: the tool that solves the problem.
- III. Demonstration.
 - A. Definition of demonstration.
 1. First statement of the definition.
 - a. Aristotle's precise meaning: cause and necessary.
 - (1) Example: triangles have 180 degrees is necessary.
 2. Definition of demonstration through matter.
 - a. Premisses must be true.
 - b. Premisses are first and immediate.
 - (1) Recall what prior in order of knowledge is.
 - c. Premisses are prior in order of knowledge to the conclusion.
 - d. Premisses state cause of fact which conclusion states.
 - B. Demonstration propter quid and quia.
 1. Problem for demonstration.
 - a. Recall difference in order of knowledge and being: God.
 - b. Difference in order causes problem for demonstration.
 2. Solution to problem.
 - a. Distinction of knowledge of fact and of reasoned fact.
 - b. Demonstration propter quid and quia.
- IV. Problem of learning and first principles.
 - A. Sensation is pre-existing knowledge for first principles.
 - B. Aristotle's comparison: rout in battle.
 1. Application to learning first principles from sensation.
 - C. Example in medicine: the herb that cures fever.
- V. Conclusion: need logic of discovery for finding demonstrations and first principles.

Supplementary Text

Introduction

In our last two lessons we talked about the fundamental tool of the judging part of logic, the syllogism. St. Thomas told us that judgment implies certainty. The syllogism provides us with a conditional certainty by its form alone; that is, if the premisses of the syllogism are true, then the conclusion certainly is true. We want, however, a logical tool

that will provide us with absolute certainty. That kind of certainty will be provided by the tool called demonstration, or the demonstrative syllogism. Demonstration uses the form of the syllogism, and adds to it a certain matter to produce an absolutely certain conclusion. This lesson will be a discussion of demonstration.

Aristotle discusses demonstration in his book called the *Posterior Analytics*. He begins that book by referring to the problem of learning. Since the classic statement of that problem is given before Aristotle, by Plato, we are first going to look at his dialogue called *Meno* to see what exactly the problem of learning is.³

The Problem of Learning

We talked about *Meno* before in our discussion of the definition. Meno asks Socrates whether virtue is teachable, and Socrates responds that he cannot answer that question until he knows what virtue is. After Meno gives several bad definitions of virtue, he decides to give up the search for the definition of virtue, and poses the problem of learning as the cause. This is how the problem is stated in the dialogue:

The learner cannot search for what he knows since then there is no need to search. Nor for what he does not know, for he does not know what to look for.

For example, if the learner already knows what virtue is, then there is not need to learn it. But if he does not know what virtue is, then even if someone told him the definition he would not recognize it as the true definition of virtue. Therefore, it is impossible to learn what virtue is.

Plato himself, through the mouth of Socrates, gives as an answer to this problem his theory of recollection. Plato claims that before we were born our souls existed in another realm in which we knew everything that we later say that we are learning. When we are born, we forget that knowledge, and the process called learning is simply the recalling, or recollecting, of knowledge that we possess already but in a hidden way. We can restate this position in another way: we already know the answers to all the questions, but our own knowledge is hidden from us, and the process of learning is simply the process of uncovering that hidden knowledge.

Aristotle has several reasons for rejecting Plato's solution to the problem of learning. First, he does not think that the soul can exist before the body. Second, he thinks the notion of "hidden knowledge" is incoherent. We will give his reasons later in this lesson. Third, and most important for our immediate purposes, he thinks that he can solve the problem of learning without appealing to hidden knowledge. Aristotle believes he can use his doctrine of the syllogism to solve the problem of learning.

As we saw before, if the premisses in a syllogism are true, then the conclusion necessarily is also true. But recognizing the truth of something which one did not previously know is learning. The syllogism, then, solves the problem of learning. It gives a way for the learner to recognize the truth of the conclusion, namely, because it follows

from the truth of premisses the truth of which he already knows. That is, he can use the knowledge that he already possesses in order to learn what he does not yet know.

In the *Posterior Analytics* Aristotle is talking about learning in the strongest sense of the term, acquiring certain knowledge of some new truth. And the logical tool that we use to acquire certain knowledge of a new truth is called demonstration. Our next task then is to look at Aristotle's account of demonstration.

The Definition of Demonstration

In Chapter Two of his *Posterior Analytics*, Aristotle gives the following definition of demonstration. He writes:

By demonstration I mean a syllogism productive of scientific knowledge. A syllogism, that is, the grasp of which is in itself such knowledge.

This definition, like every good definition, has a genus and a specific difference. The genus is obvious: it is "syllogism," and we have already given a lengthy account of what a syllogism is. Let us move right to the specific difference, "producing scientific knowledge."

In the modern world, the word "science" usually refers to knowledge of physical things that is acquired through systematic experimentation and that is expressed mathematically. A modern man would call physics, chemistry, or astronomy "sciences," but he would be reluctant to say that ethics or philosophy is a "science." After all, in ethics and philosophy there is no experimentation and no mathematical rigor, and these disciplines are not about physical things.

If we go back to ancient or medieval times, however, we find that the word "science" had a much different meaning. The ancients meant by "science" any kind of knowledge which was gained through the process of reasoning and which achieved a great degree of certainty. Consequently, modern men refuse to call science many of the disciplines which the ancients did. For example, the ancients and medieval called ethics the "moral science" because there is reasoned out certain knowledge about ethical matters, but few modern men would call ethics a science.

And on the other hand, certain things that modern men call science, the ancients might be reluctant to give that label to. For example, modern men would tend to call some of the more conjectural theories of modern physics advances in "scientific knowledge," but the ancients would not because these theories do not achieve the certainty which they considered requisite to science. Thus when Aristotle says that demonstration is a syllogism which produces "scientific knowledge," he means it produces reasoned-out and certain knowledge on any subject.

In the *Posterior Analytics* Aristotle gives us a more precise account of what he means by scientific knowledge. He writes:

We suppose ourselves to possess unqualified scientific knowledge of a thing when we think that we know the cause on which the fact depends as the cause of that fact and of no other, and further that the fact could not be other than it is.

Perhaps we could rephrase Aristotle's definition this way: I have scientific knowledge of a fact when I know that some particular fact absolutely must be true, and when I know exactly why that particular fact is true.

We can use the example from the last lesson to illustrate what Aristotle means. The following syllogism also constitutes a demonstration.

All three-sided figures have angles that add up to 180 degrees.
 All triangles have three sides.
 Therefore all triangles have angles that add up to 180 degrees.

This syllogism constitutes a demonstration first because it proves that a certain fact cannot be otherwise than it is. That is, we know both that every triangle has to have three sides and that a three-sided figure has to have angles that add up to 180 degrees. Since those two propositions are necessarily true and the conclusion necessarily follows from them, the conclusion is also necessarily true. Thus, our syllogism shows that this fact is necessarily true.

Furthermore, it gives the reason why this particular fact is true. When we study geometry, we find that the sum of angles in any geometrical figure varies according to the number of sides that such a figure has. For instance, the sum of angles in a four-sided figure adds up to 360 degrees, that of a pentagon is 540 degrees. When someone asks us why a triangle has angles that add up to 180 degrees, our answer is "because a triangle has three sides." Thus, our syllogism not only shows that the conclusion has to be true, it also shows precisely why this particular conclusion is true. It is a demonstration in the strict sense of that term.

It is clear now what Aristotle means when he defines demonstration as a syllogism which produces scientific knowledge. But Aristotle gives another definition of demonstration, a definition that St. Thomas in his commentary says is a definition through the matter of the syllogism rather than through its end.

When St. Thomas distinguishes definition through end and definition through matter, he is making a subtle philosophical point. Every tool has two aspects, an end and a matter. The end is the purpose of the tool, that is, what the tool is made for, while the matter is what the tool is made of. Since different tools are made of different materials because they have different purposes, we can deduce the matter of a tool from its purpose. Then in the definition of the tool we can take either its purpose or its matter as the specific difference.

For instance, I can define the saw as "a carpenter's tool for cutting large pieces of wood." Such a tool has to be made of a handle and a metal blade with teeth, because only something with such a handle and such a blade could cut large pieces of wood.

Thus I can give a second definition of the saw in which the specific difference is taken from the matter rather than from the purpose: a saw is a carpenter's tools made of a handle and a metal blade with teeth.

Likewise, there are two definitions of the logical tool which is demonstration. After giving a definition from its purpose, Aristotle defines demonstration through the nature of its matter, that is, its premisses. Because demonstration has as its purpose achieving scientific knowledge, it has to be made of premisses which can produce scientific knowledge. Thus Aristotle gives the following account of the premisses of demonstration. He writes:

Assuming then that my thesis as to the nature of scientific knowing is correct, the premisses of demonstrated knowledge must be true, primary and immediate, better known than and prior to the conclusion, which is further related to them as effect to cause.

Here Aristotle has given a list of the four prime characteristics of demonstrative premisses.

First, the premisses of a demonstration have to be true. We recognize the truth of the demonstrated conclusion because it follows from the truth of the premisses. But if the premisses of the syllogism are false, they cannot help us recognize the truth of the conclusion, even if the conclusion happens to be true. It is possible to draw a true conclusion from false premisses, but it is impossible to know that a conclusion is true through false premisses. Thus the premisses of a demonstration must be true.

Second, the premisses of a demonstration have to be first and immediate. Aristotle means by "first and immediate" not being proved by some prior syllogism. That is, the demonstrations have their ultimate source in a starting point which is self-evident. For example, the premiss "All triangles have three sides" is first and immediate: geometry states this truth but does not try to prove it. How we come to know the self-evident premiss is something he discusses later, when he completes his solution to the problem of learning.

Third, Aristotle says that the premisses of a demonstration have to be better known than and prior to the conclusion. That is, the premisses are prior to the conclusion in the order of knowledge. Recall what we said about the prior and posterior in knowledge in the *Categories*: A comes before B in the order of knowledge when I can know A without knowing B, but I cannot know B without knowing A.

This is clearly going to be the relationship between the premisses of the demonstrative syllogism and its conclusion. We can know the premisses of a demonstrative syllogism individually, and fail to put them together in a syllogism. Then we know the premisses but we do not know the conclusion. But we cannot know the truth of the conclusion without beforehand knowing the truth of the premisses. Therefore premisses are prior to and better known than the conclusion in the order of knowledge.

For instance, we can know that a triangle has three sides without knowing that its angles equal 180 degrees. We cannot know that its angles equal 180 degrees without knowing that it has three sides. Thus, in the science of geometry the fact that a triangle has three sides is better known than and prior in the order of knowledge to the fact that a triangle has angles that equal 180 degrees.

The last characteristic of the premisses of a demonstrative syllogism is that they are the cause of the conclusion. What Aristotle means by this is that the premisses of the syllogism indicate the cause, the reason why the conclusion of the syllogism is true. And this clearly follows from the definition that we gave before for scientific knowledge. If demonstration is to produce scientific knowledge, it has to be a syllogism which gives us the reason why the conclusion is true. Now the only thing in the syllogism that can do that are the premisses. The premiss "triangles have three sides", gives us the reason why the conclusion "triangles have angles that add up to 180 degrees" is true. Thus, the premisses tell us why the conclusion is true, that is, give the cause for the conclusion.

We have then two definitions of this most perfect tool of reasoning, the demonstrative syllogism. The first definition takes its specific difference from the end. Demonstration is a syllogism whose purpose is to give us certain and reasoned-out knowledge, or scientific knowledge. The second definition is taken from the matter of this tool. Demonstration is a syllogism the premisses of which are true, first and immediate, better known than and prior to the conclusion, and the cause of the conclusion.

A Second Meaning of the Term "Demonstration"

But there is a problem. Remember, at the end of the *Categories* Aristotle distinguishes four main meanings of the terms prior and posterior. We noticed that there is a difference between being prior in being and prior in knowledge. For instance, God comes before creatures in being because God can exist without creatures, but creatures cannot exist without God. This is true because God is the cause of creatures. But creatures come before God in the order of knowing because we can know creatures without knowing about God, but we cannot know about God without knowing something about creatures. In this case the effect, creatures, is more known to us than the cause, God.

If we apply what we have said about the premisses of demonstration to this example, it wreaks havoc Aristotle's definition. Our definition said that the premisses of a demonstration must be both better known than the conclusion and the cause of the conclusion. But there are many cases in which what is prior in the order of knowledge is the effect, and what comes posterior in the order of knowledge is the cause. It seems, then, that it is impossible to have demonstration about these matters.

Distinction of Knowledge of Fact and of Reasoned Fact

Aristotle did not overlook this difficulty, and he gives the following solution in Chapter 13 of the first book of the *Posterior Analytics*. He writes:

Knowledge of the fact differs from knowledge of the reasoned fact. To begin with, when the premisses are immediate, but instead of the cause, the better known of the two reciprocals is taken as the middle, for of reciprocally predicable terms, the one which is not the cause may quite easily be better known and so become the middle term of demonstration.

Aristotle is saying that besides knowledge of the reasoned fact, a knowledge of the reason why, there is another kind of knowledge, knowledge of the bare fact. Knowledge of the reasoned fact is the knowledge that some fact is necessarily true through the causes of that fact. Knowledge of the fact is simply knowledge that the fact is necessarily true, but not through the causes of that fact. It tells us what is true, but not why it is true.

This results in two meanings of the term "demonstration." In textbooks of scholastic philosophy and theology they are called demonstration *propter quid* and demonstration *quia*. Demonstration *propter quid* is demonstration in the strictest sense, which gives us knowledge both of the necessity of the fact and of the reason why the fact is true. Demonstration *quia* is demonstration in a weaker sense, which only tells us that the fact must be true. It starts from the effect and deduces the cause. For example, our knowledge of God's existence comes through a *quia* demonstration: seeing the created world, we deduce the existence of an intelligent and all-powerful Creator. The *quia* demonstration solves the problem of how we can have demonstration in natural theology.

Aristotle gives a very clear example of demonstration of the fact. Let us go over that example briefly. He lays out the following syllogism:

All planets do not twinkle.
 Every light that does not twinkle is a relatively near light.
 Therefore, every planet is a relatively near light.

First we will examine how he comes to this particular syllogism and second why this syllogism is a *quia* demonstration and not *propter quid*.

If we observe the night sky, we see that most of the stars keep a fixed position relative to each other. But there are a few stars which move around in the sky, that is, have different relative positions on different nights. The ancients called those stars planets, or wanderers. The planets have another property: they do not twinkle when we look at them. The other stars, called the fixed stars, do twinkle when we look at them. This is the source of Aristotle's first premiss: all planets do not twinkle.

We also can notice that even on earth night nearby lights do not twinkle, while distant lights do. For instance, the streetlight in front of my house does not twinkle to my sight but rather gives off a steady light, while the lights outside of homes across the valley from our home do twinkle. This is the source of Aristotle's second premiss: every light that does not twinkle is a relatively near light.

Putting those two premisses together in the aforementioned syllogism, we get the conclusion that every planet is a relatively near light; or, more precisely, that the planets are nearer to us than the fixed stars. But this syllogism is a demonstration of the fact, a *quia* demonstration, and not a demonstration of the reasoned fact, or *propter quid* demonstration. It gives us only knowledge of the fact that the planets are near, it does not tell us why the planets are near. In fact, in this case the order of reality is the opposite of the order of our knowledge. The planets do not twinkle because they are near. That is, this demonstration takes an effect, that the planets do not twinkle, and makes it the premiss of our syllogism, and from that premiss we deduce the cause, that the planets are near. We must proceed in this way because the effect, the non-twinkling of the planets, is better known to us than the cause, the relative position of the planets. Thus the argument that the planets are nearer than the fixed stars is example of a demonstrative syllogism in this secondary sense of demonstration, demonstration of the fact, or *quia* demonstration.

These are the very basic issues involved in the subject of demonstration. Our discussion of the difference between *quia* and *propter quid* demonstrations shows us that solving the problem of learning is not going to be as easy and uncomplicated as it might have seemed from our first discussion of demonstration. But before we get to the next lesson, I would like to talk about one more thing in Aristotle's *Posterior Analytics*, the last chapter. We saw earlier that demonstration needs first and immediate principles. We now need to ask how we can learn those self-evident principles.

Return to the Problem of Learning

Since the syllogism is not going to solve the problem of how we learn the truth of the self-evident principles of all knowledge, we might be tempted at this point to adopt a modified form of Plato's solution to the problem of learning. We might claim that we are born with a knowledge of the first principles, and we merely need to recollect them in order to use them. Later philosophers took up the same idea as the doctrine of innate ideas. Aristotle explicitly rejects this position. He writes:

Now it is strange if we possess them [that is, the first principles] from birth, for it means that we possess apprehensions more certain than demonstration and fail to notice them.

Remember that the premisses of a demonstrative syllogism are always better known than the conclusion. Therefore, the truths that we know best are the first principles. No one who possess demonstration of a truth is unaware that he possesses this knowledge. How then could we possess knowledge even more certain, knowledge of the first principles, and be unaware that we possess it? According to Aristotle, a Platonic account of our knowledge, even our knowledge of the first principles, is incoherent.

Aristotle's answer is that we learn the first principles through sensation. He says we are granted before that learning was possible only because there was some pre-existent knowledge from which you could produce the new knowledge. We knew the truth of the premisses, and therefore we could learn the truth of the conclusion from them. Our

knowledge of the first principles is the first kind of intellectual knowledge we have, but it is not absolutely first. Sensation pre-exists intellectual understanding. Thus the knowledge which is sensation provides us with the pre-existent knowledge we need in order to learn the first principles.

In order to explain how we get knowledge of the first principles from sensation, Aristotle makes a comparison to a battle. Let us examine that comparison, and then apply it to the process of coming to know the first principles. Aristotle writes:

It is like a rout in battle stopped by first one man making a stand and then another, until the original formation has been restored. The soul is so constituted as to be capable of this process.

A civilized nation organizes the men in its armies into fighting units, formations with officers and ordered ranks. But when a fighting unit is overwhelmed by a more powerful force, the unit is routed. The individual men are the same, but after the rout they are simply a fleeing mob. But at a certain point, one man may stop, look back, and see that the enemy force is not pursuing their unit. He takes a stand. Another, seeing him taking a stand, looks back and takes a stand as well. The whole mob coalesces around these men. They then reconstitute themselves as a fighting unit.

This process of going from a fleeing mob to a fighting unit parallels the process of going from sense knowledge to a knowledge of the first principles. The mob of fleeing men is like sensation because sensation is a constant flow of new perceptions. Some of these sensations remain in us, however, and become memories. When those many memories are like each other, they can gather together and constitute one experience in our memory, just like the mob coalesces around the men who have taken a stand. And from those many memories collected in experience, the first universal comes to be in the soul, just as when those men retake their positions, and become again a fighting unit.

After Aristotle has compared the process of coming to know the first principles to the rout in battle, he uses an example from medical practice to make the process even clearer. Doctors want to cure fevers and in ancient times would try various herbs as remedies. Suppose that a doctor cures Socrates' fever with a particular herb, and Plato's and Aristotle's fevers as well. Each case initially constituted a sensation, a perception of a fever and a giving of the herb. Each incident remains in the doctor's mind after each of the patients is gone and thus constitutes a memory. When the doctor takes these many memories and groups them together, saying to himself, "Socrates, Plato, and Aristotle were all cured of their fever by this herb," he has one experience. And the experience takes us to the threshold of intellectual knowledge because at this point the doctor draws the following conclusion: "This herb cures fever in all men." At that point the doctor has arrived at the universal. His knowledge is now intellectual because universal and he has perceived something that can be a first principle in the science of medicine. Aristotle's contention, then, is that we learn the first principles of demonstration through sensation.

All of these considerations show us that we can look at the whole *Posterior Analytics* in two different ways. In one way we can look at it as the book which teaches us about the most perfect tool of discursive reasoning, the demonstrative syllogism. It is through the demonstrative syllogism that we can have certain knowledge of the truth and that kind of knowledge of the truth is the goal of logic. But we can also look at it as the answer to Meno's problem of learning. In the first part of the book, Aristotle shows us how we can use the demonstrative syllogism to solve Meno's problem with regard to our knowledge of conclusions. In the second part of the book, Aristotle shows us how we can solve Meno's problem with regard to the first principles of demonstration.

Conclusion

If we read only the *Posterior Analytics*, we might get an oversimplified version of how to solve the problem of learning. We know how to construct a demonstrative syllogism, but not how to discover one. Moreover, we know that the mind goes from experience to the universal principle, but we don't know what logical tools it uses in that process. It is thus clear that we will need more than the demonstrative syllogism to make sure that we acquire certain knowledge of the truth. The rest of this course is going to be devoted to talking about the discovering part of logic, which gives us tools of reasoning which, while less perfect, are just as necessary as the demonstrative syllogism.

Exercises

Short Essays (250 words)

1. Explain how "demonstration" is used analogously of demonstration *propter quid* and demonstration *quia*.
2. How does the *Posterior Analytics* solve Meno's problem of learning?

Lesson 10: Dialectic

Readings

Topics (I.1-2, 12)

by Aristotle, translated by W. A. Pickard-Cambridge

Book I

- 1.

OUR treatise proposes to find a line of inquiry whereby we shall be able to reason from opinions that are generally accepted about every problem propounded to us, and also shall ourselves, when standing up to an argument, avoid saying anything that will obstruct us. First, then, we must say what reasoning is, and what its varieties are, in order to grasp dialectical reasoning: for this is the object of our search in the treatise before us.

Now reasoning is an argument in which, certain things being laid down, something other than these necessarily comes about through them. (a) It is a 'demonstration', when the premisses from which the reasoning starts are true and primary, or are such that our knowledge of them has originally come through premisses which are primary and true: (b) reasoning, on the other hand, is 'dialectical', if it reasons from opinions that are generally accepted. Things are 'true' and 'primary' which are believed on the strength not of anything else but of themselves: for in regard to the first principles of science it is improper to ask any further for the why and wherefore of them; each of the first principles should command belief in and by itself. On the other hand, those opinions are 'generally accepted' which are accepted by every one or by the majority or by the philosophers-i.e. by all, or by the majority, or by the most notable and illustrious of them. Again (c), reasoning is 'contentious' if it starts from opinions that seem to be generally accepted, but are not really such, or again if it merely seems to reason from opinions that are or seem to be generally accepted. For not every opinion that seems to be generally accepted actually is generally accepted. For in none of the opinions which we call generally accepted is the illusion entirely on the surface, as happens in the case of the principles of contentious arguments; for the nature of the fallacy in these is obvious immediately, and as a rule even to persons with little power of comprehension. So then, of the contentious reasonings mentioned, the former really deserves to be called 'reasoning' as well, but the other should be called 'contentious reasoning', but not 'reasoning', since it appears to reason, but does not really do so. Further (d), besides all the reasonings we have mentioned there are the mis-reasonings that start from the premisses peculiar to the special sciences, as happens (for example) in the case of geometry and her sister sciences. For this form of reasoning appears to differ from the reasonings mentioned above; the man who draws a false figure reasons from things that are neither true and primary, nor yet generally accepted. For he does not fall within the definition; he does not assume opinions that are received either by every one or by the majority or by philosophers-that is to say, by all, or by most, or by the most illustrious of them-but he conducts his reasoning upon assumptions which, though appropriate to the science in question, are not true; for he effects his mis-reasoning either by describing the semicircles wrongly or by drawing certain lines in a way in which they could not be drawn.

The foregoing must stand for an outline survey of the species of reasoning. In general, in regard both to all that we have already discussed and to those which we shall discuss later, we may remark that that amount of distinction between them may serve, because it is not our purpose to give the exact definition of any of them; we merely want to describe them in outline; we consider it quite enough from the point of view of the line of inquiry before us to be able to recognize each of them in some sort of way.

2.

Next in order after the foregoing, we must say for how many and for what purposes the treatise is useful. They are three-intellectual training, casual encounters, and the philosophical sciences. That it is useful as a training is obvious on the face of it. The possession of a plan of inquiry will enable us more easily to argue about the subject proposed. For purposes of casual encounters, it is useful because when we have counted up the opinions held by most people, we shall meet them on the ground not of other people's convictions but of their own, while we shift the ground of any argument that they appear to us to state unsoundly. For the study of the philosophical sciences it is useful, because the ability to raise searching difficulties on both sides of a subject will make us detect more easily the truth and error about the several points that arise. It has a further use in relation to the ultimate bases of the principles used in the several sciences. For it is impossible to discuss them at all from the principles proper to the particular science in hand, seeing that the principles are the prius of everything else: it is through the opinions generally held on the particular points that these have to be discussed, and this task belongs properly, or most appropriately, to dialectic: for dialectic is a process of criticism wherein lies the path to the principles of all inquiries.

12.

Having drawn these definitions, we must distinguish how many species there are of dialectical arguments. There is on the one hand Induction, on the other Reasoning. Now what reasoning is has been said before: induction is a passage from individuals to universals, e.g. the argument that supposing the skilled pilot is the most effective, and likewise the skilled charioteer, then in general the skilled man is the best at his particular task. Induction is the more convincing and clear: it is more readily learnt by the use of the senses, and is applicable generally to the mass of men, though reasoning is more forcible and effective against contradictory people.

Outline

I. Introduction.

- A. Besides judgement, we need discovery through dialectic.
- B. Aristotle covers in Topics.

II. The Use of Dialectic.

- A. Three uses.
 1. First use: sharpen the mind.
 2. Second use: casual encounter.
 3. Third use: philosophical sciences.
 - a. Prepare for conclusions.
 - b. Discuss the first principles.
- B. Common to uses.

1. Dialectic is an ability to discuss anything.
 - a. Demonstration restricted to one subject.
2. Dialectic involves intellectual combat.
3. Sum up two common points: universal subject and combat.

III. Tools of dialectic.

A. Syllogism.

1. Definition of dialectical syllogism: syllogism producing opinion.
 - a. Science yields complete assent.
 - b. Opinion yields fear of error.
 - c. Doubt is not assent, opinion is assent with fear.
2. Premises, matter of dialectical syllogism is not certain.
 - a. Starts from probable opinion instead of true and first and immediate.
 - b. Aristotle explain the probable: St. Albert adds likely.

B. Induction.

1. What induction is.
 - a. Induction goes from individuals to universals.
 - (1) Aristotle's example.
 - (2) My example.
 - b. Difference with syllogism: does not conclude with certainty from form.
2. Use of induction.
 - a. Induction is way to first principles.
 - (1) Reflection on example from Posterior Analytics.
 - (2) Example with certain matter: child knows triangle vaguely.
 - (a) Child see through induction that every triangle has three sides, has insight.
 - (b) Requirements for induction with certain matter: common nature, predicate is part of definition of subject.
 - i) Self-evident propositions.
 3. Summing up induction. Individual to universal, probable by form, necessary matter sometimes.

IV. Conclusion: fair and unfair intellectual combat.

Supplementary Text

Introduction

In our last lesson we finished our discussion of the judging part of logic. Judgment always has certitude, and the certitude of judgment can come from either the form of reasoning alone, that is, the syllogism simply, or from the matter of reasoning, as in the demonstrative syllogism. But we also noted in our discussion of demonstration that before we can judge whether a theory is true or false, we need to discover it. Thus before we can use the judging part of logic, we need to use the discovering part.

Aristotle calls the chief part of discovering logic dialectic and discusses it in a book called the *Topics*. This lesson will examine Aristotle's *Topics*.

The Uses of Dialectic

Since I want to make sure that our discussion of logic is useful in your intellectual life, the first thing we are going to examine in dialectic is not its nature or definition, but rather its utility. Aristotle explains it as follows:

We must say how many and for what purposes the treatise is useful. They are three: intellectual training, casual encounters, and the philosophical sciences.

Aristotle here enumerates three different uses for the dialectical art. Let us take up these uses one at a time.

Aristotle thinks that the first use of dialectic is for intellectual training. Even a superficial reading of Plato's dialogues reveals that what he calls dialectic is an art of intellectual debate. And it is clear that debate sharpens the mind. Even today teachers recommend that promising students become involved in their school's debate society. If debating sharpens the mind, and dialectic is a skill in debating, then the practice of dialectic clearly contributes to sharpening the mind.

The second use is for casual discussions. Suppose that one wishes to discuss a philosophical question with somebody who has not studied philosophy. He cannot present philosophical demonstrations to that person because the latter will just not be able to follow them. He will need some other kind of logical tool in order to have a discussion about philosophy with that person. Aristotle says that dialectic is that kind of tool.

Finally, philosophers use dialectic in two ways. First, when a philosopher wishes to come to some conclusion in the philosophical sciences, it is often helpful for him to look at both sides of the issue. For example, if he is trying to demonstrate that God exists, he may also want to look at the arguments that purport to show that God does not exist. Aristotle says that dialectic is the tool for that kind of procedure.

Philosophers also use dialectic to discuss the first principles of philosophy. We said before, at the end of our last lesson, that all demonstration goes back to first principles, first premisses which are not demonstrated, but which we learn in some way through sense experience. What is clear from our discussion is that the principles do not come directly from sense experience, but rather that we have to go through a process to draw them out of sense experience. Aristotle does not say what exactly that process is in the *Posterior Analytics*. But he points out in the *Topics* that that process is often a dialectical process. Dialectic allows us to discuss the principles of demonstrative syllogisms, and even reason about them. It enables us, not to prove them, but to discuss and reason about them, and this helps us to learn them.

What these three uses have in common indicates two important properties of dialectic. First, dialectic gives you the power to discuss anything. When we are training someone's intellect, we are not training it just for one particular task. We are training the intellect as a whole to be sharper in thinking about any subject. Our casual discussions can also be about any philosophical subject.

Aristotle also says that dialectic gives us an ability to discuss the conclusions or principles of any discipline. The logical tool that is demonstration, in contrast, does not give us such a power. While the syllogistic form can be used in any science, the principles which form the necessary matter for demonstrations are each restricted to one science. For example, the postulates of geometry cannot be the premisses of a demonstration in metaphysics. The use of the demonstrative syllogism presupposes a firm grasp of the principles of a science, and therefore that tool does not by itself give us a power to reason on any subject. Aristotle claims, however, that the possession in itself of the tools of dialectic give the mind the ability to reason dialectically about any subject, whether or not we have a firm grasp of the first principles of that subject.

For instance, even if we have read and understood the *Posterior Analytics* in its entirety and understood it thoroughly, we could not give a demonstration in metaphysics unless we also had a firm grasp of the first principles of metaphysics. We can, however, reason dialectically about metaphysical subjects as soon as we have acquired the dialectical art, and even before we have a firm grasp of metaphysical principles because dialectic is the power of reasoning probably about any subject. Dialectic is a power to discuss any subject at all, but, as we shall see, only to reason about it with probability, not certainty.

The second thing we can notice about all of these uses of dialectic is that they involve a combat between intellectual opponents. When one debates for the sake of training his mind, he is arguing with an opponent about the truth of something. When we having a casual conversation about a philosophical matter with a non-philosopher, it is because the non-philosopher takes up a position contrary to the philosophical one. And when the philosopher is looking at the pros and cons of a particular philosophical question, once again there are conflicting opinions.

Thus all of the uses of dialectic indicate two things about it. First, it is a power that deals with any intellectual matter at all. Secondly, it is a power of disputing about intellectual matters. And since dialectic is part of the discovering part of logic, it is clear that the purpose of dispute is to prepare the mind for a further, more perfect knowledge about the subject under discussion, if such a knowledge is possible.

The First Tool: The Dialectical Syllogism

Now that we've talked about the general nature of dialectic, we need to talk about the specific tools that dialectic uses to accomplish its purpose. There are two main tools of dialectical reasoning. The first is the dialectical syllogism; the second is induction.

The dialectical syllogism, like all syllogisms, has certainty from its form. If the premisses are true, then the conclusion has to be true. But the difference between the dialectical and the demonstrative syllogism is that the dialectical syllogism does not have certainty from its matter. We can state this more precisely by giving a definition of the dialectical syllogism that is parallel to that of demonstration. Demonstration was a syllogism that produced scientific knowledge. Dialectic will be defined as a syllogism which produces opinion. And just as we had to define scientific knowledge, now we will have to define opinion.

First I want to contrast opinion with science. We already saw that science is reasoned-out and certain knowledge. When my intellect possesses certain knowledge about something, it makes a complete assent to that truth, an assent so complete that there is no fear of error. When I really understand the demonstration for the angles of a triangle adding up to 180 degrees, my intellect by its own power assents to it completely, without any fear that the conclusion might turn out to be false.

Clearly this is not the case with opinion. With opinion, I have a fear that the opposite of what I hold might be true. And that is evident because I often change my opinion about matters. Thus opinion lacks that complete assent which is the hallmark of science and belief.

But opinion also differs from doubt. My mind is in a state of doubt when it makes no assent at all to either side of an issue. When I am in a state of opinion, my mind does assent to one side. Thus we might expand our definition of the dialectical syllogism by saying this: the dialectical syllogism is a syllogism which produces an assent to one side of an issue, with a fear that the other side might be true.

We said before that through its form a syllogism always has some kind of certainty. But clearly opinion is not absolutely certain like reasoned out knowledge is. Therefore, it must be that the product of the dialectical syllogism is not completely certain because it uses matter, premisses, that are not completely certain.

Thus, we can also describe the premisses of a dialectical syllogism in a way that is parallel to the premisses of demonstration. We said before that premisses of demonstration are true, first and immediate, prior to and better known than the conclusion, and cause of the conclusion. The dialectical syllogism will not start from premisses that are true, immediate and first. Rather, it will start from probable premisses, premisses that lack certitude. In other words, the dialectical syllogism starts from opinions.

Aristotle describes the premisses of the dialectical syllogism as follows:

Syllogism, on the other hand, is dialectical, if it reasons from opinions that are probable. . . . Those opinions are probable which are accepted by everyone, or by the majority or by the philosophers.

Aristotle's explanation of the probable is that they are premisses accepted either by all men, or by most men, or by the wisest men. St. Albert points out to us in his commentary on Aristotle's *Topics* that when Aristotle defines the probable, he does not mean that various classes of people accept it. Rather, he also means that it is likely to be true. In fact, the word likely really means like the true. Various people accept various opinions because to them those opinions seem likely to be true.

We should now ask ourselves how we get the kinds of propositions that we can use as the premisses in the dialectical syllogism. He writes:

A dialectical proposition consists in **asking** something that is held by all men, or by most men, or by the wise.

As we saw before, the premisses of a dialectical syllogism must be probable, that is, held to be likely by all, by most, or by the wise. Since dialectic is an intellectual combat, the premiss most of all must be probable to the opponent. We find what is probable to our opponent by proposing a premiss in the form of a question. Such a question, which secures the premiss of a dialectical syllogism, is called the dialectical proposition.

The conclusion at which we are aiming also has a special name: it is called the dialectical problem. A problem because dialectic always presumes that there is a disagreement about what should be the conclusion of the dialectical inquiry. One side asks questions of the other hoping to lead him by syllogisms to assent to the questioner's side of the conclusion. The answerer tries to avoid letting that happen. Both hope to change the mind of the other about the dialectical problem.

For instance, two people might debate on this question of whether the world began in time. Suppose that the first holds that it had a beginning in time, and the second that it is eternal. The first might approach this dialectic problem as follows:

Dialectical problem: Did the world have a beginning in time? The dialectical problem about whether the world had a beginning in time has been resolved by syllogizing from premisses which are answers to the questions called dialectical propositions.

Q: The world was created by God, was it not? (First dialectical proposition)

A: Yes.

Q: But things that are made by another thing always have a beginning in time, are they not? (The second dialectical proposition)

A: I suppose so.

Q: Then it follows necessarily that the world had a beginning in time. (Conclusion which resolves the problem)

Now the subtleties of this dialectical art concern two things: how to find the desired dialectical propositions and how to avoid granting premisses. That is, the questioner has the task of finding dialectical propositions whose answers will lead to the conclusion he desires. The answerer must figure out how to avoid granting the premisses that lead to the conclusion that he opposes. The good dialectician knows both how to force his opponent to change his opinion and how to avoid letting his opponent force him to do so. The rest of Aristotle's *Topics* contains rules, called topics, which direct dialectical combat in these areas. Since discussing those rules in detail would constitute a course in itself (the *Topics* is the longest treatise in the *Organon*), we must be content in this course to examine only the basic nature of the dialectical tools.

The Second Tool: Induction

We have sufficiently discussed the dialectical syllogism. The next tool of dialectical reasoning that we must examine is induction. Aristotle discusses induction in the twelfth chapter of the first book of the *Topics*. He writes:

We must distinguish how many species there are of dialectical arguments. There is on the one hand induction, and on the other, syllogism. Now what syllogism is has been said before. Induction is a passage from individuals to universals. For example, the argument that supposing the skilled pilot is the most effective and likewise the skilled charioteer, then in general the skilled man is best at his particular task.

Aristotle here has given us both a definition and an example of induction. We are going to go over both, and then we are going to talk about the difference between induction and syllogism. Finally we are going to talk about the relation between induction and demonstration.

First, what is essential to induction is that it is a passage or reasoning process that goes from many individual cases to a universal case. Let us think about what is necessary in order to go from many individuals to the universal. First, since the statements about individuals lead to statements about universals, all of the individuals statements must have the same predicate. The statements Fido barks and Rover has four legs do not yield an induction because their predicates are difference. Fido barks and Rover barks do have a common predicate.

Second, there must be something common to all the individuals so that we can gather the statements about them into one universal statement. Rover is brown and the basketball is brown do not have a subject with a common nature. But Fido barks and Rover barks do contain subjects with a common nature. In sum, the individuals at the foundation of an induction must have a common nature that can be related to a common predicate.

Aristotle gives an example of an induction. All of the particular statements have a common predicate, most effective. All of the subjects, skilled pilot and skilled charioteer, have a common nature: skilled man. The induction concludes by predicating the

common predicate of the common nature universally: Every skilled man is most effective. We can take our even more ordinary example. I see Fido bark, then I see that Rover barks, and finally I see Spot bark. All three have a common predicate: barking. There is a common nature to all three subjects, they are all dogs. From those three cases I then conclude, All dogs bark.

These examples should make clear the important difference between induction and the syllogism. With a syllogism, given that the premisses are true, the conclusion must be true. With an induction, even if all the premisses are true, the conclusion is not necessarily true. For example, in reality not every dog barks: the conclusion to the second induction turns out to be false. Therefore, in virtue of its form an induction only concludes with probability. That is why Aristotle speaks about induction primarily in the *Topics*, a book devoted to probable reasoning.

Even though induction does not conclude with certainty from its form, it remains a vital logical tool. For instance, many if not most of the great discoveries of modern science have been made using an inductive process, the careful observation of many different cases. Of course, in order to make those discoveries absolutely certain the scientists must move from induction to the demonstrative syllogism, but in order to come up with the discovery at all, that is, in order to have some reason to make that demonstration, the scientists first needs good reasons for thinking that his theory is probably true. Induction often provides those good reasons.

Furthermore, although induction does not achieve certainty through its form, sometimes it arrives at an absolutely certain conclusion because of its matter. In fact, the process by which we come to these first principles of demonstration is a process of induction.

Recall the example we talked about at the end of our last lesson. The doctor notices that when he gives a certain herb to Socrates, Socrates is cured of his fever. The same is true with Plato, and the same is true with Aristotle. And then he goes on to formulate the principle that this kind of herb always cures fever. This is a process of reasoning from individual statements to a universal, and thus it is clearly a process of induction. What Aristotle was teaching at the end of the *Posterior Analytics* was that induction is the way to the first principles.

We know, however, that those first principles are not just probable, they are certain. Thus before we conclude this lesson we should discuss how because of its matter an induction can yield a conclusion that is absolutely certain. An example is the process by which children come to understand shapes. You can give a child a toy that is a box with holes of various shapes in the sides, and pieces that can be put in. There is a square hole and a square piece, a round hole and a round piece, a triangular hole and a triangular piece. The child soon learns to put the triangular piece in the triangular hole. That is, he has grasped something about what a triangle is, even though he has not formulated a definition of the triangle.

Suppose then that you take the child aside and start counting the sides of triangles. He says, This triangle has three sides, that triangle has three sides, this other triangle has

three sides. The child will soon see that every triangle has three sides. Now the process of coming to that universal proposition is one of induction. But when he makes that jump to all triangles have three sides, he does not make only an induction. Rather, through the induction he comes to see more deeply into the nature of the triangle. He has come to see that having three sides is part of what it means to be a triangle.

In general, if we have the right matter, individuals which have a common nature and a common predicate which is part of the very definition of that common nature, then even though the form of the induction is uncertain, by the process of intellectual insight we can see from the matter of the induction that the conclusion has absolute certainty. The results of such inductions are the propositions that are the first principles of all demonstrative syllogisms.

St. Thomas calls such propositions self-evident. He defines the self-evident proposition as a proposition whose predicate is in the very definition of its subject. Since having three sides is in the very definition of triangle, it is self-evident that the statement, All triangles have three sides is true. Though the proposition is self-evident, we yet learn it through a process of induction.

This is how we can sum up what we have said about induction. Induction is a tool that primarily belongs to the process of dialectic. It is a tool by which the intellect goes from an understanding of many individual statements to an understanding of a statement about the universal. Unlike the syllogism, its conclusion does not necessarily follow from its premisses, though the conclusion is probably true given the truth of the premisses. On occasion, however, that induction can be the cause of someone coming to the insight that the predicate of the conclusion belongs to the very definition of the subject of the conclusion. In that case, the induction results in the person seeing that its conclusion is self-evidently true, and that kind of statement is a first principle of demonstrative science.

Conclusion

We have seen that dialectic is a power of intellectual combat whose primary tools or weapons are the dialectical syllogism and induction. Dialectic is about fair combat. There are no underhanded methods, no hidden tricks in dialectic. But there is a kind of intellectual combat which is unfair, in which underhanded tactics are used, in which hidden tricks are performed. The power to carry on this unfair intellectual combat is called sophistry. Aristotle talks about it in his book *Sophistical Refutations*, and its primary tool is the fallacy. In our next lesson we are going to look at Aristotle's *Sophistical Refutations*, the power of sophistry, and the kinds of fallacies.

Exercises

1. Write a very short dialogue (about 1 page) in the style of Plato. Make sure the dialogue contains one induction and one dialectical syllogism.

2. Write a short essay explaining the dialogue. Point out the dialectical problem and the dialectical propositions. Then explain whether the dialogue would be suitable for intellectual training, causal intellectual discussion, or the philosophical sciences.

Lesson 11: Sophistic Reasoning

Readings

On Sophistical Refutations (I.1, 4-5)

by Aristotle, translated by W. A. Pickard-Cambridge

Book I

1.

LET us now discuss sophistic refutations, i.e. what appear to be refutations but are really fallacies instead. We will begin in the natural order with the first.

That some reasonings are genuine, while others seem to be so but are not, is evident. This happens with arguments, as also elsewhere, through a certain likeness between the genuine and the sham. For physically some people are in a vigorous condition, while others merely seem to be so by blowing and rigging themselves out as the tribesmen do their victims for sacrifice; and some people are beautiful thanks to their beauty, while others seem to be so, by dint of embellishing themselves. So it is, too, with inanimate things; for of these, too, some are really silver and others gold, while others are not and merely seem to be such to our sense; e.g. things made of litharge and tin seem to be of silver, while those made of yellow metal look golden. In the same way both reasoning and refutation are sometimes genuine, sometimes not, though inexperience may make them appear so: for inexperienced people obtain only, as it were, a distant view of these things. For reasoning rests on certain statements such that they involve necessarily the assertion of something other than what has been stated, through what has been stated: refutation is reasoning involving the contradictory of the given conclusion. Now some of them do not really achieve this, though they seem to do so for a number of reasons; and of these the most prolific and usual domain is the argument that turns upon names only. It is impossible in a discussion to bring in the actual things discussed: we use their names as symbols instead of them; and therefore we suppose that what follows in the names, follows in the things as well, just as people who calculate suppose in regard to their counters. But the two cases (names and things) are not alike. For names are finite and so is the sum-total of formulae, while things are infinite in number. Inevitably, then, the same formulae, and a single name,

have a number of meanings. Accordingly just as, in counting, those who are not clever in manipulating their counters are taken in by the experts, in the same way in arguments too those who are not well acquainted with the force of names misreason both in their own discussions and when they listen to others. For this reason, then, and for others to be mentioned later, there exists both reasoning and refutation that is apparent but not real. Now for some people it is better worth while to seem to be wise, than to be wise without seeming to be (for the art of the sophist is the semblance of wisdom without the reality, and the sophist is one who makes money from an apparent but unreal wisdom); for them, then, it is clearly essential also to seem to accomplish the task of a wise man rather than to accomplish it without seeming to do so. To reduce it to a single point of contrast it is the business of one who knows a thing, himself to avoid fallacies in the subjects which he knows and to be able to show up the man who makes them; and of these accomplishments the one depends on the faculty to render an answer, and the other upon the securing of one. Those, then, who would be sophists are bound to study the class of arguments aforesaid: for it is worth their while: for a faculty of this kind will make a man seem to be wise, and this is the purpose they happen to have in view. Clearly, then, there exists a class of arguments of this kind, and it is at this kind of ability that those aim whom we call sophists. Let us now go on to discuss how many kinds there are of sophistical arguments, and how many in number are the elements of which this faculty is composed, and how many branches there happen to be of this inquiry, and the other factors that contribute to this art.

4.

There are two styles of refutation: for some depend on the language used, while some are independent of language. Those ways of producing the false appearance of an argument which depend on language are six in number: they are ambiguity, amphiboly, combination, division of words, accent, form of expression. Of this we may assure ourselves both by induction, and by syllogistic proof based on this-and it may be on other assumptions as well-that this is the number of ways in which we might fall to mean the same thing by the same names or expressions. Arguments such as the following depend upon ambiguity. 'Those learn who know: for it is those who know their letters who learn the letters dictated to them'. For to 'learn' is ambiguous; it signifies both 'to understand' by the use of knowledge, and also 'to acquire knowledge'. Again, 'Evils are good: for what needs to be is good, and evils must needs be'. For 'what needs to be' has a double meaning: it means what is inevitable, as often is the case with evils, too (for evil of some kind is inevitable), while on the other hand we say of good things as well that they 'need to be'. Moreover, 'The same man is both seated and standing and he is both sick and in health: for it is he who stood up who is standing, and he who is recovering who is in health: but it is the seated man who stood up, and the sick man who was recovering'. For 'The sick man does so and so', or 'has so and so done to him' is not single in meaning: sometimes it means 'the man who is sick or is seated now', sometimes 'the man who was sick formerly'. Of course, the man who was recovering was the sick man, who really was sick at the time: but the man who is in health is not sick at the same time: he is 'the sick man' in the sense not that he is sick now, but that he was sick formerly. Examples such as the following depend upon amphiboly: 'I wish

that you the enemy may capture'. Also the thesis, 'There must be knowledge of what one knows': for it is possible by this phrase to mean that knowledge belongs to both the knower and the known. Also, 'There must be sight of what one sees: one sees the pillar: ergo the pillar has sight'. Also, 'What you profess to-be, that you profess to-be: you profess a stone to-be: ergo you profess-to-be a stone'. Also, 'Speaking of the silent is possible': for 'speaking of the silent' also has a double meaning: it may mean that the speaker is silent or that the things of which he speaks are so. There are three varieties of these ambiguities and amphibolies: (1) When either the expression or the name has strictly more than one meaning, e.g. aetos and the 'dog'; (2) when by custom we use them so; (3) when words that have a simple sense taken alone have more than one meaning in combination; e.g. 'knowing letters'. For each word, both 'knowing' and 'letters', possibly has a single meaning: but both together have more than one-either that the letters themselves have knowledge or that someone else has it of them.

Amphiboly and ambiguity, then, depend on these modes of speech. Upon the combination of words there depend instances such as the following: 'A man can walk while sitting, and can write while not writing'. For the meaning is not the same if one divides the words and if one combines them in saying that 'it is possible to walk-while-sitting' and write while not writing]. The same applies to the latter phrase, too, if one combines the words 'to write-while-not-writing': for then it means that he has the power to write and not to write at once; whereas if one does not combine them, it means that when he is not writing he has the power to write. Also, 'He now if he has learnt his letters'. Moreover, there is the saying that 'One single thing if you can carry a crowd you can carry too'.

Upon division depend the propositions that 5 is 2 and 3, and odd, and that the greater is equal: for it is that amount and more besides. For the same phrase would not be thought always to have the same meaning when divided and when combined, e.g. 'I made thee a slave once a free man', and 'God-like Achilles left fifty a hundred men'. An argument depending upon accent it is not easy to construct in unwritten discussion; in written discussions and in poetry it is easier. Thus (e.g.) some people emend Homer against those who criticize as unnatural his expression to men ou kataputhetai ombro. For they solve the difficulty by a change of accent, pronouncing the ou with an acuter accent. Also, in the passage about Agamemnon's dream, they say that Zeus did not himself say 'We grant him the fulfilment of his prayer', but that he bade the dream grant it. Instances such as these, then, turn upon the accentuation. Others come about owing to the form of expression used, when what is really different is expressed in the same form, e.g. a masculine thing by a feminine termination, or a feminine thing by a masculine, or a neuter by either a masculine or a feminine; or, again, when a quality is expressed by a termination proper to quantity or vice versa, or what is active by a passive word, or a state by an active word, and so forth with the other divisions previously laid down. For it is possible to use an expression to denote what does not belong to the class of actions at all as though it did so belong. Thus (e.g.) 'flourishing' is a word which in the form of its expression is like 'cutting' or 'building': yet the one denotes a certain quality-i.e. a certain condition-while the other denotes a certain action. In the same manner also in the other instances.

Refutations, then, that depend upon language are drawn from these common-place rules. Of fallacies, on the other hand, that are independent of language there are seven kinds:

- (1) that which depends upon Accident:
- (2) the use of an expression absolutely or not absolutely but with some qualification of respect or place, or time, or relation:
- (3) that which depends upon ignorance of what 'refutation' is:
- (4) that which depends upon the consequent:
- (5) that which depends upon assuming the original conclusion:
- (6) stating as cause what is not the cause:
- (7) the making of more than one question into one.

5.

Fallacies, then, that depend on Accident occur whenever any attribute is claimed to belong in like manner to a thing and to its accident. For since the same thing has many accidents there is no necessity that all the same attributes should belong to all of a thing's predicates and to their subject as well. Thus (e.g.), 'If Coriscus be different from "man", he is different from himself: for he is a man': or 'If he be different from Socrates, and Socrates be a man, then', they say, 'he has admitted that Coriscus is different from a man, because it so happens (accidit) that the person from whom he said that he (Coriscus) is different is a man'.

Those that depend on whether an expression is used absolutely or in a certain respect and not strictly, occur whenever an expression used in a particular sense is taken as though it were used absolutely, e.g. in the argument 'If what is not is the object of an opinion, then what is not is': for it is not the same thing 'to be x' and 'to be' absolutely. Or again, 'What is, is not, if it is not a particular kind of being, e.g. if it is not a man.' For it is not the same thing 'not to be x' and 'not to be' at all: it looks as if it were, because of the closeness of the expression, i.e. because 'to be x' is but little different from 'to be', and 'not to be x' from 'not to be'. Likewise also with any argument that turns upon the point whether an expression is used in a certain respect or used absolutely. Thus e.g. 'Suppose an Indian to be black all over, but white in respect of his teeth; then he is both white and not white.' Or if both characters belong in a particular respect, then, they say, 'contrary attributes belong at the same time'. This kind of thing is in some cases easily seen by any one, e.g. suppose a man were to secure the statement that the Ethiopian is black, and were then to ask whether he is white in respect of his teeth; and then, if he be white in that respect, were to suppose at the conclusion of his questions that therefore he had proved dialectically that he was both white and not white. But in some cases it often passes undetected, viz. in all cases where, whenever a statement is

made of something in a certain respect, it would be generally thought that the absolute statement follows as well; and also in all cases where it is not easy to see which of the attributes ought to be rendered strictly. A situation of this kind arises, where both the opposite attributes belong alike: for then there is general support for the view that one must agree absolutely to the assertion of both, or of neither: e.g. if a thing is half white and half black, is it white or black?

Other fallacies occur because the terms 'proof' or 'refutation' have not been defined, and because something is left out in their definition. For to refute is to contradict one and the same attribute—not merely the name, but the reality—and a name that is not merely synonymous but the same name—and to confute it from the propositions granted, necessarily, without including in the reckoning the original point to be proved, in the same respect and relation and manner and time in which it was asserted. A 'false assertion' about anything has to be defined in the same way. Some people, however, omit some one of the said conditions and give a merely apparent refutation, showing (e.g.) that the same thing is both double and not double: for two is double of one, but not double of three. Or, it may be, they show that it is both double and not double of the same thing, but not that it is so in the same respect: for it is double in length but not double in breadth. Or, it may be, they show it to be both double and not double of the same thing and in the same respect and manner, but not that it is so at the same time: and therefore their refutation is merely apparent. One might, with some violence, bring this fallacy into the group of fallacies dependent on language as well.

Those that depend on the assumption of the original point to be proved, occur in the same way, and in as many ways, as it is possible to beg the original point; they appear to refute because men lack the power to keep their eyes at once upon what is the same and what is different.

The refutation which depends upon the consequent arises because people suppose that the relation of consequence is convertible. For whenever, suppose A is, B necessarily is, they then suppose also that if B is, A necessarily is. This is also the source of the deceptions that attend opinions based on sense-perception. For people often suppose bile to be honey because honey is attended by a yellow colour: also, since after rain the ground is wet in consequence, we suppose that if the ground is wet, it has been raining; whereas that does not necessarily follow. In rhetoric proofs from signs are based on consequences. For when rhetoricians wish to show that a man is an adulterer, they take hold of some consequence of an adulterous life, viz. that the man is smartly dressed, or that he is observed to wander about at night. There are, however, many people of whom these things are true, while the charge in question is untrue. It happens like this also in real reasoning; e.g. Melissus' argument, that the universe is eternal, assumes that the universe has not come to be (for from what is not nothing could possibly come to be) and that what has come to be has done so from a first beginning. If, therefore, the universe has not come to be, it has no first beginning, and is therefore eternal. But this does not necessarily follow: for even if what has come to be always has a first beginning, it does not also follow that what has a first beginning has

come to be; any more than it follows that if a man in a fever be hot, a man who is hot must be in a fever.

The refutation which depends upon treating as cause what is not a cause, occurs whenever what is not a cause is inserted in the argument, as though the refutation depended upon it. This kind of thing happens in arguments that reason ad impossibile: for in these we are bound to demolish one of the premisses. If, then, the false cause be reckoned in among the questions that are necessary to establish the resulting impossibility, it will often be thought that the refutation depends upon it, e.g. in the proof that the 'soul' and 'life' are not the same: for if coming-to-be be contrary to perishing, then a particular form of perishing will have a particular form of coming-to-be as its contrary: now death is a particular form of perishing and is contrary to life: life, therefore, is a coming to-be, and to live is to come-to-be. But this is impossible: accordingly, the 'soul' and 'life' are not the same. Now this is not proved: for the impossibility results all the same, even if one does not say that life is the same as the soul, but merely says that life is contrary to death, which is a form of perishing, and that perishing has 'coming-to-be' as its contrary. Arguments of that kind, then, though not inconclusive absolutely, are inconclusive in relation to the proposed conclusion. Also even the questioners themselves often fail quite as much to see a point of that kind. Such, then, are the arguments that depend upon the consequent and upon false cause. Those that depend upon the making of two questions into one occur whenever the plurality is undetected and a single answer is returned as if to a single question. Now, in some cases, it is easy to see that there is more than one, and that an answer is not to be given, e.g. 'Does the earth consist of sea, or the sky?' But in some cases it is less easy, and then people treat the question as one, and either confess their defeat by failing to answer the question, or are exposed to an apparent refutation. Thus 'Is A and is B a man?' 'Yes.' 'Then if any one hits A and B, he will strike a man' (singular), 'not men' (plural). Or again, where part is good and part bad, 'is the whole good or bad?' For whichever he says, it is possible that he might be thought to expose himself to an apparent refutation or to make an apparently false statement: for to say that something is good which is not good, or not good which is good, is to make a false statement. Sometimes, however, additional premisses may actually give rise to a genuine refutation; e.g. suppose a man were to grant that the descriptions 'white' and 'naked' and 'blind' apply to one thing and to a number of things in a like sense. For if 'blind' describes a thing that cannot see though nature designed it to see, it will also describe things that cannot see though nature designed them to do so. Whenever, then, one thing can see while another cannot, they will either both be able to see or else both be blind; which is impossible.

Outline

I. Introduction.

A. Dialectic tools of fair combat.

B. Comparison to boxing: sophistic unfair combat.

II. Two meanings of "Logic."

- A. What order my lectures have taken.
 - 1. Two reasons: tradition and two meanings of logic.
- B. Definition of logic in strict sense.
- C. Second meaning of logic.

III. Sophistic Reasoning.

- A. Definition of the Sophist.
 - 1. General notion: Deceptive likeness.
 - a. St. Thomas defines sophist by desire.
 - b. Aristotle: desire for money, historical setting.
 - 2. Examples of superficial likeness.
 - a. Wise man refutes and is not refuted.
 - b. Sophist appears to refute and not be refuted.
 - c. Contrast to dialectic, which is like wisdom.
 - (1) Two ways of appearing wise or dialectical: seem to argue from probable, argue from seems probable.
- B. Tools of the sophist.
 - 1. Tools are called fallacies.
 - a. Reasons we are using obvious examples.
 - 2. Fallacy dependent upon language.
 - a. Comparison to accounting.
 - (1) Application of comparison to accounting.
 - b. Called fallacy of equivocation.
 - (1) Example of equivocation.
 - (2) Analysis of fallacy.
 - 3. Fallacy not dependent upon language.
 - a. Definition of fallacy of accident.
 - (1) Example: Indian, white, man.
 - (2) Not equivocation.
 - (3) How it happens in a disputation.
 - (a) Closer to essential, more deceptive.
 - 4. These are the principles of the other fallacies.

IV. Conclusion.

- A. Tools of rhetoric and poetics useful for philosopher and theologian.

Supplementary Text

Introduction

In our last lesson we talked about dialectic, and Aristotle's *Topics*. Dialectic gave us the tools or weapons for a fair intellectual combat, the dialectical syllogism and induction. These tools do not give their possessors the ability to come to certain knowledge

because that is reserved for the demonstrative syllogism. But they do give him a dialectical power, an ability to dispute in a reasonable way about anything.

But just as there are weapons for a fair intellectual combat, so there are weapons for an unfair intellectual combat. We could make a comparison to boxing. It is fair for a boxer to use boxing gloves, but not to use brass knuckles. Gloves are weapons of fair combat, brass knuckles are weapons of unfair combat. Just as in boxing, so also in intellectual combat there are fair and unfair weapons. Induction and the dialectical syllogism are like boxing gloves, while the tools of sophistical reasoning are the brass knuckles of intellectual combat. In this lesson we are going to talk about Aristotle's *Sophistical Refutations*. In that book he describes sophistical reasoning and the weapons used by the sophist. Knowing those weapons, we can defend ourselves from his unfair intellectual combat.

What Order My Lessons Have 2Taken

Before we cover the sophistic part of logic, I want to discuss the order of my lessons. We talked about the judging part of logic in lessons 7, 8, and 9. In lesson 10 we talked about the beginning of the discovering part of logic, dialectic. It seems that in this lesson I should complete my discussion of the discovering part of logic, instead of jumping to the third and ultimate part of logic, sophistical logic.

I discuss sophistic before rhetoric and poetics for two reasons. My first is a simple appeal to tradition. If we look at the traditional arrangement of the texts of Aristotle, we find that the *Topics* is followed immediately by the *Sophistical Refutations*.

The *Rhetoric* and *Poetics* are usually placed outside the collection which is called the *Organon*. While it might be better to place those two treatises in the *Organon*, there is a reason for this tradition. It is that the term logic has many meanings in an ordered relationship. That is, logic is a word used analogously of, say, the *Categories* and the *Poetics*. Let me explain why the word is used analogously.

St. Thomas distinguishes two kinds of science, speculative and practical. The practical sciences are bodies of knowledge which aim at directing human actions. Speculative sciences, on the other hand, aim at nothing besides knowledge itself. For example, ethics is a practical science because it studies virtue, not to know what virtue is, but for the sake of doing virtuous actions. Metaphysics, on the other hand, is a speculative science. We study metaphysics simply because it is good to know the truths that it teaches.

Logic is not in itself a speculative science. We do not study logic just for the sake of knowing logical truths, but for the sake of using that knowledge to direct our minds to other knowledge. Still, the ancients placed logic in the genus of speculative science because it is the tool of speculative science. We use logic primarily as a tool to acquire knowledge for its own sake. And it is evident that the main treatises in Aristotle's *Organon* are ordered to speculative knowledge, knowledge for its own sake.

It is clear that all of the treatises up to the *Posterior Analytics* contribute to our study of that book. Moreover, that book is itself the crown of logic, since through its tools we gain certain and reasoned-out knowledge. And since dialectic is also ordered to a discovery of the truth, then dialectic also is included in logic as the tool of speculative science. In fact, even sophistic reasoning is a tool of speculative science because, by avoiding fallacies and by defending ourselves from the fallacies of others, we move ourselves closer to the goal of having speculative knowledge.

From all of these considerations we can gather the following definition of logic in the strict sense of that term: **logic is the art which directs the actions of reason in its acquisition of speculative knowledge**. When we look at rhetoric and poetic, we see that they are not parts of logic thus strictly defined. For both rhetoric and poetic have an end outside of speculative knowledge and appeal to means which are outside of the realm of the intellect. Thus, neither directs reason in its acquisition of speculative knowledge.

First, rhetoric aims at something besides knowledge. Rhetoric aims at persuasion, and when one is persuaded of something, he is not simply persuaded that one side or another of a controversy is true. He is persuaded that one side or another of a controversy is good, and thus that one thing ought to be pursued, and another to be avoided. And when we talk about the good, and pursuit and avoidance, we are talking about the realm of action and we are going beyond the realm of speculative science. Thus rhetoric aims at something apart from speculative knowledge.

Likewise, poetics aims at something other than knowledge. Poetics directs the action of the intellect in making poetry (imaginative literature, not just verse). But literature aims primarily at beauty and at pleasure from the perception of beauty, both of which always have the characteristic of being good. But when we bring in the good and the bad, we are concerned with desire and human action, and our end is not just knowledge. Thus, poetics and rhetoric both aim at something beside knowledge.

Rhetoric and poetics also use tools that go beyond the intellect. For example, in rhetoric, I appeal to the emotions of those to whom I am speaking and in poetics, I make representations to which people have a desire or an aversion. Emotion and desire, however, are outside the intellect and clearly outside the realm of logic, as that term is usually understood. The means used by logic in the strictest sense of that term always relate to knowledge. Once again, rhetoric and poetics fall outside of the subject of logic strictly defined.

But they do not fall outside of logic in every way in which the term could properly be used. We can give a second definition of logic which is different but related to the first. We could say that **logic is the art which directs the actions of reason**. This definition differs from the first by cutting off the last part of the first, in its acquisition of the speculative knowledge. And when we cut off that last part, we use the term logic in a broader sense and include rhetoric and poetic. They can be included in this analogous sense because they still are arts which direct reason in its actions. That is, it is reason that undertakes the task of persuading, and it is reason that directs the action of making

poetry. Thus this broader sense of the term logic includes everything that is included in the narrow sense, plus rhetoric and poetics.

The Third Meaning of the Term Logic : Symbolic Logic

Logic also has a third meaning. If you look in your local library for a book on logic, most likely you will encounter a book filled with horseshoes and squiggles and parentheses and upside down letters, that is, a book filled with symbols. The symbols will be arranged in things that look like equations. We call that symbolic or mathematical logic. When we talk about that as logic, we are using logic in a third meaning. In that case we say that **logic is a study of the relations that occur between symbols**. This study is called logic because there is a likeness between logic as Aristotle talks about it and the relations between symbols. The relations between symbols produce certain necessary consequences, just like the premisses of a syllogism produce certain necessary consequences. Because of this likeness, the term logic has acquired a third meaning.

This is not, however, a third analogous use of the term logic, but a use of the term that is purely equivocal. This may seem strange, since we said before that terms that are used analogously have different but related meanings, and this seems to fit the bill. When I talk about symbolic logic as being logic, logic has a different but related meaning to when I talk about the *Categories* as being part of logic. But we need to remember that analogy had a purpose. The purpose of analogy was to make what one thing is better known by showing that it has a likeness to another very well known thing. And what is necessary for analogy is that the likeness between the two is very central to what they are. But if the likeness between the two things is superficial, then calling them by the same name does not help us understand the less known one; rather, it makes the less known one even more obscure to us. It points to a superficial and accidental likeness as if it were essential to the thing. This happens when we use the term logic to apply both to the symbolic logic and to Aristotle's logic.

The primary purpose of Aristotle's logic is to direct the actions of reason. Some of those actions have necessary consequences, but others do not. For example, the syllogism has a necessary consequence attached to it, but induction does not. Thus that there are necessary relations in symbolic logic makes it like Aristotle's logic only in a superficial way.

More importantly, symbolic logic does not really direct the actions of reason. Symbolic logic is about directing the manipulation of symbols, but the manipulation of symbols is not a strictly rational action. This is clear because even an obviously non-rational thing, such as an adding machine, can manipulate symbols. The manipulation of symbols does not require the understanding of the nature of a thing, while reasoning is rooted in such an understanding. Thus when we apply the term logic to symbolic logic, we are using that term purely equivocally, in a way that obscures the nature of both symbolic logic and Aristotle's logic. It is probably better not to use the term logic at all, and call symbolic logic the art of calculation.

Sophistic and Deceptive Likeness

Symbolic logic having a deceptive likeness to Aristotle's logic calls to mind sophistic logic, because sophistic and the art of the sophist are rooted in deceptive likeness. But before we plunge into the subject of sophistic logic, we should indicate the order in which we are going to take it up. First, we are going to talk about what a sophist is. Second, we are going to talk about the kind of power that the sophist has, the sophistic power. Third, we are going to talk about the tools that the sophist uses.

In his commentary on Aristotle's *Metaphysics* St. Thomas describes the difference between the philosopher and the sophist. He writes:

But the philosopher differs from the sophist in choice, that is, in selecting or willing or in desiring a way of life. For the philosopher and the sophist direct their life and actions to different things. The philosopher directs his to knowing the truth, whereas the sophist directs his so as to appear to know what he does not.

Here we see that notion of deceptive appearance. The philosopher wants to know the truth and be wise. The sophist wants to appear to know a truth he does not in fact know. He wants to appear wise, when he is in fact not wise.

Aristotle in the beginning of *Sophistical Refutations* makes a similar point:

The art of the sophist is the semblance of wisdom, without the reality. And the sophist is one who makes money from an apparent, but unreal wisdom.

Aristotle is thinking of something very specific. There were men in his time who went to the Greek city-states and offered to teach for a fee the arts of disputing well, living well, and being powerful. These men often made great sums of money from their teaching. These men, however, did not care about actually being wise or about actually being able to teach the art which they claimed to possess to their pupils. It was enough for them that they could appear to be wise, and appear to teach this art, so that their pupils would pay them. Thus anyone who values more the appearance of wisdom than its reality is a sophist in his heart, that is, by his choice.

A man appears wise without actually being so if he takes on the superficial characteristics of wisdom. In other words, the sophist takes on a certain deceptive likeness of wisdom. Aristotle makes a comparison between precious metals and non-precious metals. Tin, for example, has the outward appearance of silver, and brass has the outward appearance of gold. The inexperienced, seeing that kind of likeness, might mistake tin and brass for silver and gold. In the same way, a wise man has certain outward appearances. The sophist imitates those outward appearances, and his power to imitate them constitutes his sophistic power.

What are those superficial characteristics? In another passage near the beginning of the *Sophistical Refutations*, Aristotle describes the likeness between the wise man and the sophist.

It is the business of one who knows a thing himself to avoid mistakes on the subject which he knows, and to be able to show up the man who makes them. And of these accomplishments, the one depends on the power to render an answer, and the other upon the securing of one.

One task of the wise man is to avoid making mistakes in a dispute. First, he avoids contradicting himself in a dispute about a subject which he understands. Second, when others contradict him, he refutes their arguments. These are the superficial characteristics of the wise man.

If the sophist wants to appear to be the wise man, the sophist must take on the appearance, first of avoiding being refuted himself, and second of refuting those who disagree with him. That is why Aristotle's book on the sophistic part of logic is called *Sophistical Refutations*. The sophist avoids being refuted, and tries to refute others. Or rather I should say, he wants to appear to avoid being refuted and appear to refute others.

It might be helpful here also to contrast the sophist with the dialectician. We saw that dialectic was a power of fair intellectual combat. Its purpose was to refute the dialectician's opponent and avoid allowing the dialectician to be refuted. The dialectician used probable arguments against his opponent and avoided the probable arguments brought up by his opponent. Like the wise man, the dialectician refutes and avoids being refuted.

The sophist wants to appear to refute. How does he do that? Aristotle outlines two ways:

Sophistic arguments are those that appear to reason to a conclusion from probable premisses but reason badly, or those which truly reason to a conclusion but from premisses that only appear to be probable.

Aristotle says that there are two ways the sophist can achieve his end of apparent refutation. One is to seem to reason well even when reasoning badly. That is, the sophist seems to make a good syllogism, but his syllogism is actually a bad one. The second is to make a good syllogism but to start from premisses that are not really probable, but only seem to be so. That is, he starts from premisses that look like, but are not, the premisses granted by his opponent. The tools that the sophist uses to accomplish these two tricks are called fallacies. Our next task, then, is to identify the main kinds of fallacies and give a couple of examples of them.

Fallacies: Weapons of Unfair Intellectual Combat

When we are trying to understand the nature of the fallacies, we will examine examples that are very obvious because we are not so much concerned with actually seeing a sophist in action, as in understanding the tools or weapons which the sophist uses. Only a bad sophist would use the particular examples that we will look at because these arguments are too obviously fallacious, but we take obvious examples so that we might

understand what the fallacies are. Later we will be able to detect the weapons when they are less obvious.

Aristotle says there are two basic kinds of fallacies, those which depend upon the use of language, and those which do not depend. Language can be a sophistic weapon because words have many meanings. Aristotle explains it as follows:

For names are finite, and so is the sum total of definitions, while things are infinite in number. Inevitably, then, the same definitions and a single name have a number of meanings. Accordingly, just as in counting, those who are not clever in manipulating their counters are taken in by the experts, in the same way in arguments too, those who are not well acquainted with the force of names misreason, both in their own discussions, and when they listen to others.

Aristotle compares reasoning here to the science of accounting. Accounting is a very complicated business, and those who are expert accountants can deceive those who are not expert accountants; that is, they can cook the books. They can make it appear that something has been paid for when it is not been paid for. And then they can steal the money. The same thing is possible with language. Words have many meanings. Those who are not adept at using words and do not realize that words have many meanings can be taken in by those who are adept. Just like the dishonest accountant can make something that has not been paid for look like it is been paid for, so the dishonest user of words can treat a word that has two meanings as if it had only one.

That words have two meanings is not necessarily a bad thing. The proper analogous use of a word is a good thing. But when one uses those two meanings of a word as if they were just one meaning for the sake of appearing to refute but not, he has used the fallacy of equivocation. The fallacy of equivocation is the first sophistical weapon.

Let us give an example. An activist for animal rights might protest a baseball game. And she reasons as follows: Baseball mistreats animals. This is because using an animal to hit a hard baseball is mistreating it. But using a bat is using an animal to hit a hard baseball. Therefore using a bat is to mistreat animals, and baseball always does that.

It is easy to see the fallacy in that case. The word bat has two meanings but the animal rights activist is using the word bat as if it had only one meaning. Bat can mean both the flying nocturnal animal, and it can mean a wooden stick. She is assuming that the two meanings are the same when she says that to use a bat to hit the baseball is to use a nocturnal animal to hit the baseball. She has apparently refuted the baseball fan, but she has not actually done so.

The fallacy of equivocation can be used more subtly when the words have different but related meanings. We saw before that the word logic had two different meanings; one in which it was the science which directs the actions of reason toward its goal, knowledge of the truth; and another in which it was the study of the relations between symbols.

One might then make an argument which uses the fallacy of equivocation in a much more subtle way. He might say, Because logic is about the relations between symbols, and modern logic studies those relations more rigorously than Aristotle's logic does, it must be the case that modern logic is superior to Aristotle's logic. The fallacy in that argument is once again the fallacy of equivocation. The word logic when predicated of Aristotle's logic and when predicated of modern symbolic logic has two different meanings. Aristotle's logic is not a study of the relation of symbols, it is the art which directs the acts of reason toward their goal of the truth. Thus the argument does not validly conclude that symbolic logic is superior to Aristotle's.

The Fallacy of the Accident

The second tool used by the sophist is called the fallacy of the accident. It is a fallacy that does not depend upon the use of language, but rather on the deceptiveness of the relationship between accidents and the subjects to which those accidents belong. As we noted before in our discussion of the predicables, some predicates belong essentially to a thing. When a predicate belongs essentially, it belongs universally: all of the subjects must have that predicate. For example, having three sides belongs essentially to the triangle and every triangle must have three sides. Other predicates belong accidentally to their subjects. When a predicate belongs accidentally, it does not belong universally. Tanness belongs accidentally to man, and thus some men are tan, but others are not. The sophist treats an accidental predicate as if it were essential, and uses that to secure illegitimately a universal proposition as a basis for reasoning. This is the weapon that is the fallacy of the accident.

The following example might help us to see how this fallacy works. Prior to the age of exploration, northern Europeans would have had very few, if any, occasions to see human beings of other races. Thus they might tend to mistake the accident of white skin color for something that is essential to human nature. In other words, all the men that they have seen are white, therefore they think that whiteness is essential to being a man. When they first see men who are not white, let us say Indians, they might be tempted to deny their humanity. Their syllogism then would take the following form:

All men are white.
 No Indian is white.
 Therefore no Indian is truly a man.

This syllogism does not make a deceptive use of language. The important terms, Indian, man, and white, are all being used with only one meaning. The mistake is the statement All men are white. That statement assumes that whiteness is essential to humanity although it is merely accidental.

In general, the sophist looks for an accidental characteristic, has his opponent grant that characteristic as accidental, but then appears to refute his opponent because he takes that characteristic as if it were essential. In our example the sophistic racist who is arguing against a good man would get the good man to grant the statement Men are white. The good man recognizes that statement in its accidental form, that is, whiteness

is an accident of some men. But the racist, being sophistic, would take that statement as if it were meant essentially and act as if his opponent had granted that all men were white. Then he could secure his desired conclusion. Of course, the more that something accidental seems essential, the more deceptive a tool the fallacy of the accident is, and the more powerful a tool it is for the sophist.

The fallacies of equivocation and the accident are the two main fallacies. Other fallacies work because they have a likeness to these two. That is, other fallacies dependent upon language work because they have a likeness to the fallacy of equivocation, while other fallacies that are not dependent of language work because they have a kind of likeness to the fallacy of the accident. If we understand the fallacy of equivocation and the fallacy of the accident, then we are fairly well prepared to defend ourselves against any of the weapons of the sophist.

Conclusion

That concludes our study of the sophistic part of logic. We now have a general idea of how to approach reading the book *Sophistical Refutations*. In our final lesson we will talk very briefly about the main tools of the final two parts of logic, rhetoric and poetics. Even though those parts of logic in themselves aim at something beyond knowledge of the truth, nevertheless three particular tools, two used by the rhetorician and one by the poet, are also useful for the philosopher and the theologian. Our consideration will focus on those three tools.

Exercises

1. Short essay: explain why there are two meanings of logic.
2. State whether the reasoning is syllogistic, inductive, or sophistic. If sophistic, identify the kind of fallacy.

Hitler and Stalin killed millions of innocent people, and both were raised as Christians. Therefore, all Christians are bloodthirsty.

People who are interested in triangles should study geometry. The readers of the National Enquirer are interested in love triangles. Thus, they should study geometry.

Trees, shrubs, grass, and generally all plants rely on sunlight for life.

Those who study logic are well-prepared to become good philosophers. Mathematicians often study symbolic logic. Therefore, they are well-prepared to become good philosophers.

Every immaterial substance is immortal. Since the soul is an immaterial substance, it is also immortal.

Lesson 12: Rhetoric and Poetics

Readings

Rhetoric (I.1-2)

by Aristotle, translated by W. Rhys Roberts

Book I

1.

RHETORIC the counterpart of Dialectic. Both alike are concerned with such things as come, more or less, within the general ken of all men and belong to no definite science. Accordingly all men make use, more or less, of both; for to a certain extent all men attempt to discuss statements and to maintain them, to defend themselves and to attack others. Ordinary people do this either at random or through practice and from acquired habit. Both ways being possible, the subject can plainly be handled systematically, for it is possible to inquire the reason why some speakers succeed through practice and others spontaneously; and every one will at once agree that such an inquiry is the function of an art.

Now, the framers of the current treatises on rhetoric have constructed but a small portion of that art. The modes of persuasion are the only true constituents of the art: everything else is merely accessory. These writers, however, say nothing about enthymemes, which are the substance of rhetorical persuasion, but deal mainly with non-essentials. The arousing of prejudice, pity, anger, and similar emotions has nothing to do with the essential facts, but is merely a personal appeal to the man who is judging the case. Consequently if the rules for trials which are now laid down some states- especially in well-governed states- were applied everywhere, such people would have nothing to say. All men, no doubt, think that the laws should prescribe such rules, but some, as in the court of Areopagus, give practical effect to their thoughts and forbid talk about non-essentials. This is sound law and custom. It is not right to pervert the judge by moving him to anger or envy or pity- one might as well warp a carpenter's rule before using it. Again, a litigant has clearly nothing to do but to show that the alleged fact is so or is not so, that it has or has not happened. As to whether a thing is important or unimportant, just or unjust, the judge must surely refuse to take his instructions from the litigants: he must decide for himself all such points as the law-giver has not already defined for him.

Now, it is of great moment that well-drawn laws should themselves define all the points they possibly can and leave as few as may be to the decision of the judges; and this for several reasons. First, to find one man, or a few men, who are sensible persons and

capable of legislating and administering justice is easier than to find a large number. Next, laws are made after long consideration, whereas decisions in the courts are given at short notice, which makes it hard for those who try the case to satisfy the claims of justice and expediency. The weightiest reason of all is that the decision of the lawgiver is not particular but prospective and general, whereas members of the assembly and the jury find it their duty to decide on definite cases brought before them. They will often have allowed themselves to be so much influenced by feelings of friendship or hatred or self-interest that they lose any clear vision of the truth and have their judgement obscured by considerations of personal pleasure or pain. In general, then, the judge should, we say, be allowed to decide as few things as possible. But questions as to whether something has happened or has not happened, will be or will not be, is or is not, must of necessity be left to the judge, since the lawgiver cannot foresee them. If this is so, it is evident that any one who lays down rules about other matters, such as what must be the contents of the 'introduction' or the 'narration' or any of the other divisions of a speech, is theorizing about non-essentials as if they belonged to the art. The only question with which these writers here deal is how to put the judge into a given frame of mind. About the orator's proper modes of persuasion they have nothing to tell us; nothing, that is, about how to gain skill in enthymemes.

Hence it comes that, although the same systematic principles apply to political as to forensic oratory, and although the former is a nobler business, and fitter for a citizen, than that which concerns the relations of private individuals, these authors say nothing about political oratory, but try, one and all, to write treatises on the way to plead in court. The reason for this is that in political oratory there is less inducement to talk about nonessentials. Political oratory is less given to unscrupulous practices than forensic, because it treats of wider issues. In a political debate the man who is forming a judgement is making a decision about his own vital interests. There is no need, therefore, to prove anything except that the facts are what the supporter of a measure maintains they are. In forensic oratory this is not enough; to conciliate the listener is what pays here. It is other people's affairs that are to be decided, so that the judges, intent on their own satisfaction and listening with partiality, surrender themselves to the disputants instead of judging between them. Hence in many places, as we have said already, irrelevant speaking is forbidden in the law-courts: in the public assembly those who have to form a judgement are themselves well able to guard against that.

It is clear, then, that rhetorical study, in its strict sense, is concerned with the modes of persuasion. Persuasion is clearly a sort of demonstration, since we are most fully persuaded when we consider a thing to have been demonstrated. The orator's demonstration is an enthymeme, and this is, in general, the most effective of the modes of persuasion. The enthymeme is a sort of syllogism, and the consideration of syllogisms of all kinds, without distinction, is the business of dialectic, either of dialectic as a whole or of one of its branches. It follows plainly, therefore, that he who is best able to see how and from what elements a syllogism is produced will also be best skilled in the enthymeme, when he has further learnt what its subject-matter is and in what respects it differs from the syllogism of strict logic. The true and the approximately true are apprehended by the same faculty; it may also be noted that men have a sufficient

natural instinct for what is true, and usually do arrive at the truth. Hence the man who makes a good guess at truth is likely to make a good guess at probabilities.

It has now been shown that the ordinary writers on rhetoric treat of non-essentials; it has also been shown why they have inclined more towards the forensic branch of oratory.

Rhetoric is useful (1) because things that are true and things that are just have a natural tendency to prevail over their opposites, so that if the decisions of judges are not what they ought to be, the defeat must be due to the speakers themselves, and they must be blamed accordingly. Moreover, (2) before some audiences not even the possession of the exactest knowledge will make it easy for what we say to produce conviction. For argument based on knowledge implies instruction, and there are people whom one cannot instruct. Here, then, we must use, as our modes of persuasion and argument, notions possessed by everybody, as we observed in the Topics when dealing with the way to handle a popular audience. Further, (3) we must be able to employ persuasion, just as strict reasoning can be employed, on opposite sides of a question, not in order that we may in practice employ it in both ways (for we must not make people believe what is wrong), but in order that we may see clearly what the facts are, and that, if another man argues unfairly, we on our part may be able to confute him. No other of the arts draws opposite conclusions: dialectic and rhetoric alone do this. Both these arts draw opposite conclusions impartially. Nevertheless, the underlying facts do not lend themselves equally well to the contrary views. No; things that are true and things that are better are, by their nature, practically always easier to prove and easier to believe in. Again, (4) it is absurd to hold that a man ought to be ashamed of being unable to defend himself with his limbs, but not of being unable to defend himself with speech and reason, when the use of rational speech is more distinctive of a human being than the use of his limbs. And if it be objected that one who uses such power of speech unjustly might do great harm, that is a charge which may be made in common against all good things except virtue, and above all against the things that are most useful, as strength, health, wealth, generalship. A man can confer the greatest of benefits by a right use of these, and inflict the greatest of injuries by using them wrongly.

It is clear, then, that rhetoric is not bound up with a single definite class of subjects, but is as universal as dialectic; it is clear, also, that it is useful. It is clear, further, that its function is not simply to succeed in persuading, but rather to discover the means of coming as near such success as the circumstances of each particular case allow. In this it resembles all other arts. For example, it is not the function of medicine simply to make a man quite healthy, but to put him as far as may be on the road to health; it is possible to give excellent treatment even to those who can never enjoy sound health.

Furthermore, it is plain that it is the function of one and the same art to discern the real and the apparent means of persuasion, just as it is the function of dialectic to discern the real and the apparent syllogism. What makes a man a 'sophist' is not his faculty, but his moral purpose. In rhetoric, however, the term 'rhetorician' may describe either the speaker's knowledge of the art, or his moral purpose. In dialectic it is different: a man is

a 'sophist' because he has a certain kind of moral purpose, a 'dialectician' in respect, not of his moral purpose, but of his faculty.

Let us now try to give some account of the systematic principles of Rhetoric itself-of the right method and means of succeeding in the object we set before us. We must make as it were a fresh start, and before going further define what rhetoric is.

2.

Rhetoric may be defined as the faculty of observing in any given case the available means of persuasion. This is not a function of any other art. Every other art can instruct or persuade about its own particular subject-matter; for instance, medicine about what is healthy and unhealthy, geometry about the properties of magnitudes, arithmetic about numbers, and the same is true of the other arts and sciences. But rhetoric we look upon as the power of observing the means of persuasion on almost any subject presented to us; and that is why we say that, in its technical character, it is not concerned with any special or definite class of subjects.

Of the modes of persuasion some belong strictly to the art of rhetoric and some do not. By the latter I mean such things as are not supplied by the speaker but are there at the outset-witnesses, evidence given under torture, written contracts, and so on. By the former I mean such as we can ourselves construct by means of the principles of rhetoric. The one kind has merely to be used, the other has to be invented.

Of the modes of persuasion furnished by the spoken word there are three kinds. The first kind depends on the personal character of the speaker; the second on putting the audience into a certain frame of mind; the third on the proof, or apparent proof, provided by the words of the speech itself. Persuasion is achieved by the speaker's personal character when the speech is so spoken as to make us think him credible. We believe good men more fully and more readily than others: this is true generally whatever the question is, and absolutely true where exact certainty is impossible and opinions are divided. This kind of persuasion, like the others, should be achieved by what the speaker says, not by what people think of his character before he begins to speak. It is not true, as some writers assume in their treatises on rhetoric, that the personal goodness revealed by the speaker contributes nothing to his power of persuasion; on the contrary, his character may almost be called the most effective means of persuasion he possesses. Secondly, persuasion may come through the hearers, when the speech stirs their emotions. Our judgements when we are pleased and friendly are not the same as when we are pained and hostile. It is towards producing these effects, as we maintain, that present-day writers on rhetoric direct the whole of their efforts. This subject shall be treated in detail when we come to speak of the emotions. Thirdly, persuasion is effected through the speech itself when we have proved a truth or an apparent truth by means of the persuasive arguments suitable to the case in question. There are, then, these three means of effecting persuasion. The man who is to be in command of them must, it is clear, be able (1) to reason logically, (2) to understand human character and goodness in their various forms, and (3) to understand the emotions-that is, to name them and describe them, to know their causes and the way in

which they are excited. It thus appears that rhetoric is an offshoot of dialectic and also of ethical studies. Ethical studies may fairly be called political; and for this reason rhetoric masquerades as political science, and the professors of it as political experts—sometimes from want of education, sometimes from ostentation, sometimes owing to other human failings. As a matter of fact, it is a branch of dialectic and similar to it, as we said at the outset. Neither rhetoric nor dialectic is the scientific study of any one separate subject: both are faculties for providing arguments. This is perhaps a sufficient account of their scope and of how they are related to each other.

With regard to the persuasion achieved by proof or apparent proof: just as in dialectic there is induction on the one hand and syllogism or apparent syllogism on the other, so it is in rhetoric. The example is an induction, the enthymeme is a syllogism, and the apparent enthymeme is an apparent syllogism. I call the enthymeme a rhetorical syllogism, and the example a rhetorical induction. Every one who effects persuasion through proof does in fact use either enthymemes or examples: there is no other way. And since every one who proves anything at all is bound to use either syllogisms or inductions (and this is clear to us from the *Analytics*), it must follow that enthymemes are syllogisms and examples are inductions. The difference between example and enthymeme is made plain by the passages in the *Topics* where induction and syllogism have already been discussed. When we base the proof of a proposition on a number of similar cases, this is induction in dialectic, example in rhetoric; when it is shown that, certain propositions being true, a further and quite distinct proposition must also be true in consequence, whether invariably or usually, this is called syllogism in dialectic, enthymeme in rhetoric. It is plain also that each of these types of oratory has its advantages. Types of oratory, I say: for what has been said in the *Methodics* applies equally well here; in some oratorical styles examples prevail, in others enthymemes; and in like manner, some orators are better at the former and some at the latter. Speeches that rely on examples are as persuasive as the other kind, but those which rely on enthymemes excite the louder applause. The sources of examples and enthymemes, and their proper uses, we will discuss later. Our next step is to define the processes themselves more clearly.

A statement is persuasive and credible either because it is directly self-evident or because it appears to be proved from other statements that are so. In either case it is persuasive because there is somebody whom it persuades. But none of the arts theorize about individual cases. Medicine, for instance, does not theorize about what will help to cure Socrates or Callias, but only about what will help to cure any or all of a given class of patients: this alone is business: individual cases are so infinitely various that no systematic knowledge of them is possible. In the same way the theory of rhetoric is concerned not with what seems probable to a given individual like Socrates or Hippias, but with what seems probable to men of a given type; and this is true of dialectic also. Dialectic does not construct its syllogisms out of any haphazard materials, such as the fancies of crazy people, but out of materials that call for discussion; and rhetoric, too, draws upon the regular subjects of debate. The duty of rhetoric is to deal with such matters as we deliberate upon without arts or systems to guide us, in the hearing of persons who cannot take in at a glance a complicated argument, or follow a

long chain of reasoning. The subjects of our deliberation are such as seem to present us with alternative possibilities: about things that could not have been, and cannot now or in the future be, other than they are, nobody who takes them to be of this nature wastes his time in deliberation.

It is possible to form syllogisms and draw conclusions from the results of previous syllogisms; or, on the other hand, from premisses which have not been thus proved, and at the same time are so little accepted that they call for proof. Reasonings of the former kind will necessarily be hard to follow owing to their length, for we assume an audience of untrained thinkers; those of the latter kind will fail to win assent, because they are based on premisses that are not generally admitted or believed.

The enthymeme and the example must, then, deal with what is in the main contingent, the example being an induction, and the enthymeme a syllogism, about such matters. The enthymeme must consist of few propositions, fewer often than those which make up the normal syllogism. For if any of these propositions is a familiar fact, there is no need even to mention it; the hearer adds it himself. Thus, to show that Dorieus has been victor in a contest for which the prize is a crown, it is enough to say 'For he has been victor in the Olympic games', without adding 'And in the Olympic games the prize is a crown', a fact which everybody knows.

There are few facts of the 'necessary' type that can form the basis of rhetorical syllogisms. Most of the things about which we make decisions, and into which therefore we inquire, present us with alternative possibilities. For it is about our actions that we deliberate and inquire, and all our actions have a contingent character; hardly any of them are determined by necessity. Again, conclusions that state what is merely usual or possible must be drawn from premisses that do the same, just as 'necessary' conclusions must be drawn from 'necessary' premisses; this too is clear to us from the *Analytics*. It is evident, therefore, that the propositions forming the basis of enthymemes, though some of them may be 'necessary', will most of them be only usually true. Now the materials of enthymemes are Probabilities and Signs, which we can see must correspond respectively with the propositions that are generally and those that are necessarily true. A Probability is a thing that usually happens; not, however, as some definitions would suggest, anything whatever that usually happens, but only if it belongs to the class of the 'contingent' or 'variable'. It bears the same relation to that in respect of which it is probable as the universal bears to the particular. Of Signs, one kind bears the same relation to the statement it supports as the particular bears to the universal, the other the same as the universal bears to the particular. The infallible kind is a 'complete proof' (*tekmerhiou*); the fallible kind has no specific name. By infallible signs I mean those on which syllogisms proper may be based: and this shows us why this kind of Sign is called 'complete proof': when people think that what they have said cannot be refuted, they then think that they are bringing forward a 'complete proof', meaning that the matter has now been demonstrated and completed (*peperhasmeuou*); for the word 'perhas' has the same meaning (of 'end' or 'boundary') as the word 'tekmarh' in the ancient tongue. Now the one kind of Sign (that which bears to the proposition it supports the relation of particular to universal) may be illustrated thus.

Suppose it were said, 'The fact that Socrates was wise and just is a sign that the wise are just'. Here we certainly have a Sign; but even though the proposition be true, the argument is refutable, since it does not form a syllogism. Suppose, on the other hand, it were said, 'The fact that he has a fever is a sign that he is ill', or, 'The fact that she is giving milk is a sign that she has lately borne a child'. Here we have the infallible kind of Sign, the only kind that constitutes a complete proof, since it is the only kind that, if the particular statement is true, is irrefutable. The other kind of Sign, that which bears to the proposition it supports the relation of universal to particular, might be illustrated by saying, 'The fact that he breathes fast is a sign that he has a fever'. This argument also is refutable, even if the statement about the fast breathing be true, since a man may breathe hard without having a fever.

It has, then, been stated above what is the nature of a Probability, of a Sign, and of a complete proof, and what are the differences between them. In the *Analytics* a more explicit description has been given of these points; it is there shown why some of these reasonings can be put into syllogisms and some cannot.

The 'example' has already been described as one kind of induction; and the special nature of the subject-matter that distinguishes it from the other kinds has also been stated above. Its relation to the proposition it supports is not that of part to whole, nor whole to part, nor whole to whole, but of part to part, or like to like. When two statements are of the same order, but one is more familiar than the other, the former is an 'example'. The argument may, for instance, be that Dionysius, in asking as he does for a bodyguard, is scheming to make himself a despot. For in the past Peisistratus kept asking for a bodyguard in order to carry out such a scheme, and did make himself a despot as soon as he got it; and so did Theagenes at Megara; and in the same way all other instances known to the speaker are made into examples, in order to show what is not yet known, that Dionysius has the same purpose in making the same request: all these being instances of the one general principle, that a man who asks for a bodyguard is scheming to make himself a despot. We have now described the sources of those means of persuasion which are popularly supposed to be demonstrative.

There is an important distinction between two sorts of enthymemes that has been wholly overlooked by almost everybody—one that also subsists between the syllogisms treated of in dialectic. One sort of enthymeme really belongs to rhetoric, as one sort of syllogism really belongs to dialectic; but the other sort really belongs to other arts and faculties, whether to those we already exercise or to those we have not yet acquired. Missing this distinction, people fail to notice that the more correctly they handle their particular subject the further they are getting away from pure rhetoric or dialectic. This statement will be clearer if expressed more fully. I mean that the proper subjects of dialectical and rhetorical syllogisms are the things with which we say the regular or universal Lines of Argument are concerned, that is to say those lines of argument that apply equally to questions of right conduct, natural science, politics, and many other things that have nothing to do with one another. Take, for instance, the line of argument concerned with 'the more or less'. On this line of argument it is equally easy to base a syllogism or enthymeme about any of what nevertheless are essentially disconnected

subjects-right conduct, natural science, or anything else whatever. But there are also those special Lines of Argument which are based on such propositions as apply only to particular groups or classes of things. Thus there are propositions about natural science on which it is impossible to base any enthymeme or syllogism about ethics, and other propositions about ethics on which nothing can be based about natural science. The same principle applies throughout. The general Lines of Argument have no special subject-matter, and therefore will not increase our understanding of any particular class of things. On the other hand, the better the selection one makes of propositions suitable for special Lines of Argument, the nearer one comes, unconsciously, to setting up a science that is distinct from dialectic and rhetoric. One may succeed in stating the required principles, but one's science will be no longer dialectic or rhetoric, but the science to which the principles thus discovered belong. Most enthymemes are in fact based upon these particular or special Lines of Argument; comparatively few on the common or general kind. As in the therefore, so in this work, we must distinguish, in dealing with enthymemes, the special and the general Lines of Argument on which they are to be founded. By special Lines of Argument I mean the propositions peculiar to each several class of things, by general those common to all classes alike. We may begin with the special Lines of Argument. But, first of all, let us classify rhetoric into its varieties. Having distinguished these we may deal with them one by one, and try to discover the elements of which each is composed, and the propositions each must employ.

Poetics

by Aristotle, translated by S. H. Butcher

21.

Words are of two kinds, simple and double. By simple I mean those composed of nonsignificant elements, such as *ge*, 'earth.' By double or compound, those composed either of a significant and nonsignificant element (though within the whole word no element is significant), or of elements that are both significant. A word may likewise be triple, quadruple, or multiple in form, like so many Massilian expressions, e.g., 'Hermocaico-xanthus [who prayed to Father Zeus].' Every word is either current, or strange, or metaphorical, or ornamental, or newly-coined, or lengthened, or contracted, or altered. By a current or proper word I mean one which is in general use among a people; by a strange word, one which is in use in another country. Plainly, therefore, the same word may be at once strange and current, but not in relation to the same people. The word *sigynon*, 'lance,' is to the Cyprians a current term but to us a strange one. Metaphor is the application of an alien name by transference either from genus to species, or from species to genus, or from species to species, or by analogy, that is, proportion. Thus from genus to species, as: 'There lies my ship'; for lying at anchor is a species of lying. From species to genus, as: 'Verily ten thousand noble deeds hath Odysseus wrought'; for ten thousand is a species of large number, and is here used for a large number generally. From species to species, as: 'With blade of bronze drew away the life,' and

'Cleft the water with the vessel of unyielding bronze.' Here arusiai, 'to draw away' is used for tamein, 'to cleave,' and tamein, again for arusiai- each being a species of taking away. Analogy or proportion is when the second term is to the first as the fourth to the third. We may then use the fourth for the second, or the second for the fourth.

Sometimes too we qualify the metaphor by adding the term to which the proper word is relative. Thus the cup is to Dionysus as the shield to Ares. The cup may, therefore, be called 'the shield of Dionysus,' and the shield 'the cup of Ares.' Or, again, as old age is to life, so is evening to day. Evening may therefore be called, 'the old age of the day,' and old age, 'the evening of life,' or, in the phrase of Empedocles, 'life's setting sun.' For some of the terms of the proportion there is at times no word in existence; still the metaphor may be used. For instance, to scatter seed is called sowing: but the action of the sun in scattering his rays is nameless. Still this process bears to the sun the same relation as sowing to the seed. Hence the expression of the poet 'sowing the god-created light.' There is another way in which this kind of metaphor may be employed. We may apply an alien term, and then deny of that term one of its proper attributes; as if we were to call the shield, not 'the cup of Ares,' but 'the wineless cup'.

A newly-coined word is one which has never been even in local use, but is adopted by the poet himself. Some such words there appear to be: as ernyges, 'sprouters,' for kerata, 'horns'; and areter, 'supplicator', for hierous, 'priest.'

A word is lengthened when its own vowel is exchanged for a longer one, or when a syllable is inserted. A word is contracted when some part of it is removed. Instances of lengthening are: poleos for poleos, Peleideo for Peleidou; of contraction: kri, do, and ops, as in mia ginetai amphoteron ops, 'the appearance of both is one.' An altered word is one in which part of the ordinary form is left unchanged, and part is recast: as in dexiteron kata mazon, 'on the right breast,' dexiteron is for dexion.

Nouns in themselves are either masculine, feminine, or neuter. Masculine are such as end in N, R, S, or in some letter compounded with S- these being two, PS and X. Feminine, such as end in vowels that are always long, namely E and O, and- of vowels that admit of lengthening- those in A. Thus the number of letters in which nouns masculine and feminine end is the same; for PS and X are equivalent to endings in S. No noun ends in a mute or a vowel short by nature. Three only end in I- meli, 'honey'; kommi, 'gum'; peperu, 'pepper'; five end in U. Neuter nouns end in these two latter vowels; also in N and S.

Outline

I. Introduction.

- A. Reason directs its knowing about practical things: rhetoric and poetics.
- B. Completes logic and gives important tools for speculative knowledge.
- C. Two parts: enthymeme and example, metaphor.

II. Rhetoric.

A. Order of consideration of rhetoric.

B. What rhetoric is.

1. Difference: dialectic knowledge, rhetoric persuasion to action.

C. Tools of rhetoric.

1. Tools of rhetoric helpful for philosophical beginner: enthymeme and example.

2. Compare and contrast enthymeme and example to syllogism and induction.

a. Compare.

(1) Likeness: syllogism being from more universal.

(a) Enthymeme also begins with more universal.

(2) Likeness: induction begins with particular or individual.

(a) Example also begins with individuals.

b. Contrast.

(1) Contrast instances of syllogism and enthymeme.

(2) Contrast induction and example: universal vs. particular

conclusion.

3. Summary of enthymeme and example.

a. Use of these tools in rhetoric.

III. Poetics.

A. Poetics and metaphor: order of consideration.

B. Definition of metaphor.

1. Reasons poets and Scripture use metaphor.

a. Poetic instances.

b. Scriptural instance.

C. Difference between metaphor and analogy.

IV. Summing up: necessity of lesser tools.

A. Purposes for this class: understand logical terms.

B. Use logic to analyze readings.

C. Use logic to think and teach.

Supplementary Text

Introduction

In this, our twelfth and final lesson, we will say something about rhetoric and poetics. In the first eleven lessons we looked at the treatises in Aristotle's *Organon* that make up logic taken in the strict sense: logic as the art which directs the actions of reason in coming to know the truth. But we also said there was a looser sense of that term "logic," in which logic is broadly understood to be the art that simply directs the actions of reason. Sometimes we reason about human actions. Rhetoric directs our reason when it considers moral and political actions. Reason also acts in poetry, or imaginative

literature, to produce something beautiful and delightful. The science of poetics discusses this action of reason. Studying rhetoric and poetics completes our overview of Aristotle's logic. This lesson will focus on Aristotle's books, the *Rhetoric* and the *Poetics*.

There is another reason, however, for studying these two books. Some of the tools of reasoning that are most appropriate to rhetorical and poetical speech are also helpful for philosophy and theology. There are going to be three of those tools, two of them from rhetoric: the enthymeme and the argument by example. The third comes from poetics: the metaphor. In this lesson we will look at rhetoric and poetics especially to consider those tools. We can break up our discussion into two parts. In the first part we will talk about the main rhetorical tools, the enthymeme and the example. In the second we will talk about the main poetic tool, the metaphor.

Rhetoric

In order to understand what is going on in Aristotle's *Rhetoric*, first we are going to take a broad overview of the subject, secondly we are going to focus on the two tools of the enthymeme and the argument by example.

At the beginning the *Rhetoric*, Aristotle explains what rhetoric is by a comparison with dialectic. Rhetoric and dialectic share three main features. First, both the rhetorician and dialectician can argue on both sides of an issue. The dialectician, we saw, wants to defend his side and attack the other, but he may be pitted against a dialectician who is doing the same thing. Then both of the opponents in a dispute are using the dialectical power. Thus the power of dialectic is a power to argue both sides of an issue. The same is true in rhetoric. When two orators oppose each other on some course of action, they both use rhetorical arguments to try to persuade their audience. Like dialectic, rhetoric is a power that can be used on either side of an issue. On contrast, the demonstrator can argue only for one side of an issue. There is no geometrician who is going to give a proof contrary to Euclid's demonstration that the angles of a triangle add up to 180 degrees. Euclid's proof settles the matter. There is no opposing demonstration.

Second, both the rhetorician and the dialectician are able to argue about any subject whatsoever. A dialectician can argue about natural science, about metaphysics, or about ethics. It would be strange, but not unheard of, for even a rhetorician to argue about natural science and metaphysics. In this way, both differ again from the demonstrator. The geometer demonstrates about geometry, but as geometer he has nothing whatever to say about natural science or metaphysics or ethics. Again, only the metaphysician gives demonstrations about metaphysics and only the man who knows ethics can demonstrate in ethics. Thus, both rhetoric and dialectic differ from demonstration because they are powers to argue about anything. A corollary of this conclusion is that the tools a rhetorician uses, or at least some of them, can be applied to many different philosophical disciplines.

Third, both the dialectician and the rhetorician achieve only a probable conclusion, not a certain one. When we talked about the difference between rhetoric and dialectic before, we noted that the dialectical conclusion is stronger, is more often true, or is at least

closer to the truth than the rhetorical conclusion. But in contrast to the demonstrator, neither the dialectician nor the rhetorician reaches his conclusion with certainty. Thus, rhetoric and dialectic seem superior to demonstration in that each can argue both sides of an issue and can discuss anything, but ultimately both are less perfect than demonstration because their conclusions are only probable.

There are, however, important differences between rhetoric and dialectic. First, the dialectician and rhetorician have different ends or goals. The dialectician is aiming remotely at some sort of knowledge. By his argument he cannot come to complete certainty, but he can come to have pretty good reasons for holding one side of an issue, and he can use this as a stepping stone to demonstration. The rhetorician is not so much interested in coming to know as in persuading his audience. And he does not want to persuade them simply to hold an opinion. Rather, he wants to persuade them to act in some specific way because they hold that opinion. For example the dialectician might ask the question whether God exists, and he might come up with several good dialectical arguments that strongly incline him to believe that God exists. The rhetorician might also talk about the existence of God, but he talks about the existence of God in order to persuade people to behave virtuously.

Second, because the dialectician and rhetorician have different purposes for their activities, they appeal to different kinds of audiences and use different kinds of arguments. That is, the discourse of the dialectician about the existence of God is addressed to men who are relatively wise, men who have a philosophical inclination and some philosophical experience. Therefore the dialectician tends to use abstract, universal arguments. The rhetorician, however, wants to persuade people to lead virtuous lives. He wants to persuade, not only those who are already philosophically inclined, but everyone. So his arguments cannot be as abstract and universal. They have to be more concrete and particular because the concrete and particular are easier to understand.

Third, since the rhetorician wants to move people to action, he legitimately appeals to their emotions in his arguments. In contrast, the dialectician, since he does not aim at action, does not legitimately appeal to emotion. For example, the dialectician simply presents the arguments for the existence of God, while the rhetorician points out that a universe without God is appalling to people of good dispositions. The dialectician brings in argument only, while the rhetorician brings in both argument and emotion.

The Tools of Rhetoric: Enthymeme and Argument by Example

Since the rhetorician is arguing for the many, and not for the few wiser people, he is going to use logical tools which are more understandable to the beginner, even though such tools are most often less perfect and achieve less certainty. But precisely because they are more understandable by the beginner, they are very useful in philosophy, which is a difficult subject, one whose students need all the help they can get. In fact, the tools which are characteristic of the rhetorician are yet tools that Aristotle and St. Thomas use when dealing with philosophy and theology. Those tools are the enthymeme, and the argument by example.

Aristotle does not define the enthymeme and argument by example. He simply says that an enthymeme is a rhetorical syllogism, and an example a rhetorical induction. But he compares and contrasts the enthymeme with the syllogism, and the example with the induction. We will follow his lead. First, we will look at how the enthymeme and example are respectively like the syllogism and the induction. Then we will look at how they are different. Finally, we will offer something like a definition of each.

Let us first look at the likeness between the enthymeme and the syllogism. When we talked about the form of the syllogism, we said that every syllogism had to have a universal proposition. It was only because at least one of the propositions was universal, at least one of the predicates was said of all or none of its subjects, that any sort of necessary reasoning could take place. And from that universal premiss, a less universal conclusion is usually drawn. The following is a typical syllogism.

Every animal has sense desires.
Some living things are animals.
Therefore some living things have sense desires.

This syllogism began with a universal statement, every animal has sense desires, but ended with a more particular statement, some living things have sense desires.

Just as the syllogism begins from a proposition which is more universal, and concludes with one that is less universal, so also the enthymeme begins with something that is more universal, and concludes to something less universal. Take the following enthymeme:

The harder good is the better good.
But virtue is a harder good thing to acquire than pleasure.
Therefore virtue is a better thing than pleasure.

It begins with a more universal principle, "the harder good is the better good," and concludes to a more particular conclusion, "virtue is better than pleasure." Thus the enthymeme and the syllogism are alike because both begin from the more universal and conclude to the less universal.

Let us next consider the likeness between example and induction. Take the following induction:

Fido barks.
Spot barks.
Rover barks.
Therefore, all dogs bark.

Notice that it begins with particular statements, statements about individuals. The same will be true with the argument by example. Aristotle gives the following instance of an argument by example: Like the induction, this argument by example begins with statements about particulars. It begins by reciting particular facts about Peisistratus,

Theagenes, and similar rulers. The argument by example is like an induction because it begins with particular statements. That is why Aristotle calls the enthymeme a rhetorical syllogism and the argument by example a rhetorical induction.

In the past, Peisistratus asked for a bodyguard, in order to make himself a despot, and so did Theagenes at Megara; and in the same way all other instances known to the speaker in which a ruler asked for a bodyguard, he desired to become a despot. Therefore, when Dionysius now asks for a bodyguard, he has the same purpose, to become a despot.

Let us now consider the difference between the enthymeme and the syllogism. Just as a demonstration differed from a dialectical syllogism because it had different kinds of premisses, so the enthymeme is going to differ from every kind of syllogism because it has a different kind of premiss. Aristotle writes:

Now the materials of enthymemes are probabilities . . . A probability is a thing that usually happens; it bears the same relation to that in respect of which it is probable as the universal bears to the particular.

The enthymeme differs from the syllogism because a syllogism always has at least one completely universal premiss. That premiss may be false, but it is taken as completely universal. In contrast, the enthymeme starts from a probability, a premiss which is fairly, but not completely universal, in which something is true most, but not all, of the time. Since the premiss is not truly universal, the conclusion of an enthymeme does not necessarily follow from the premisses.

For instance, the syllogism which we gave above premised that "All animals have sense desires." Our enthymeme premised, "The harder good is the better good." But the latter statement is not true universally. The harder good is not always the better good, but rather there are cases in which the easier thing to do is also the better thing to do. That statement is only true most of the time. That kind of premiss does not have the universality that is required for the syllogism, but it is the appropriate material for an enthymeme because the enthymeme has a conclusion that is less certain than that of the syllogism. We might modify Aristotle's definition of the syllogism and apply it to the enthymeme: in an enthymeme, certain fairly universal premisses being given, something else probably follows from them.

Let us now see how the argument by example differs from induction. In an induction, the conclusion, though probable by the form of the induction, is universal. Our illustration of induction concluded that all dogs bark. But the argument by example comes to a particular conclusion. Our illustration of it concluded that Dionysius asked for a bodyguard in order to become a despot. But that conclusion is about an individual, not about a universal. The argument by example differs from induction because it comes up with a particular or individual, not a universal conclusion.

Let us sum up with conclusions with a couple of definitions. We can define the enthymeme as a process of reasoning which begins with what is true for the most part

and reaches a more particular conclusion that is probably true. And we define the argument by example as a process of reasoning which begins with particular premisses and ends with a particular conclusion.

We can now see why both of these tools are appropriate to rhetoric. Rhetoric is supposed to move men to action. Since we need only reasonable probability in order to act, an enthymeme is practically just as good as a syllogism, and even better because it is more easily understandable. Furthermore, actions are about particulars. The argument by example, which comes to a conclusion about a particulars, is thus more fitting than induction. And since the particular concrete individual is easier to grasp than the universal, the argument by example is also easier to understand than induction. The enthymeme and example are appropriate tools for rhetoric.

But these tools have a certain use in philosophy as well. First, we should note that philosophy is a very difficult subject in which the beginner can use all the help he can get. The first arguments that he will understand are not demonstrative, nor even dialectical. Syllogisms and even inductions are beyond him. What is proportionate to him are enthymemes and arguments by example. Furthermore, there are some philosophical subjects which do not admit of a lot of certainty. Ethics and political philosophy, because they are less certain than mathematics or metaphysics, often must rely on arguments whose forms are less certain than the form of the demonstration or even the dialectical syllogism. If you study Aristotle's *Ethics* or *Politics*, you will see that he very often uses enthymemes and arguments by example. Thus the tools of rhetoric are also useful for philosophy.

Poetics and Metaphor

We have one more tool to talk about, the tool of metaphor, which is found in Aristotle's book called the *Poetics*. The *Poetics* is more often studied in a literature course, because it gives a theory of how imaginative literature works. We are not going to worry about the famous definition of tragedy and the catharsis of fear and pity. Rather we will discuss two points. First I will point out why we need to study a poetic tool when we are talking about philosophy and theology. Second, I want to study that poetic tool, the metaphor.

In the first question of the *Summa Theologiae*, St. Thomas asks whether metaphor should be used in Sacred Scripture. One of the objections states that, because theology and poetry are so different from each other, they cannot have the same tools. Since poetry clearly uses the tool of metaphor, theology should not. St. Thomas grants that poetry and theology are far distant from each other. But they are distant from a middle, and it is precisely because they are both so distant from that middle that they can use the same tool. That middle consists of things that are readily understandable by human reason. Mathematics is the prime example of this, but natural philosophy and metaphysics are also subject proportioned to human reason. They all deal with universal truths which are derived from sense experience. Reason grasps the universal but is rooted in sensation. Thus these sciences are proportioned to reason.

Literature, however, is outside of the rational realm because it deals with singular actions. For instance, a novel is not about the universal nature of man but about particular people doing particular things in a particular time and place. Literature, then, deals with something that is below reason, but that instead falls mostly under the province of the senses, which perceive the particular and the individual. Theology, on the other hand, is outside of the rational realm, not because it is lower than reason like literature, but because it is so far above reason. That is, while God is not a concrete individual, He is also not something that can be understood very well from what we derive from the senses. The Divine Nature is so far above us, that our reason, rooted as it is in the senses, cannot grasp it. And thus, St. Thomas points out, there is a common tool which reason uses to try and grasp anything that is disproportionate, whether that this is below it or above it. That tool is the metaphor.

Aristotle in his *Poetics* defines the metaphor very simply.

Metaphor is giving a name to something that does not belong to it, but belongs to another thing.

Shakespeare gives a very famous metaphor in *Romeo and Juliet*. Romeo says: That is, Shakespeare gives the name "Sun" to Juliet. Juliet is the Sun. That name does not belong to Juliet. "Sun" is a metaphor for Juliet because, just as the sun is necessary for the life of all living things, so also Juliet is necessary for the life of Romeo.

But soft, what light through yonder window breaks? It is the East, and Juliet is the sun.

The purpose of the metaphor is to make known to us a surprising likeness between unlike things. The poet uses the metaphor because it is surprising and therefore pleasant. We like it when Romeo calls Juliet the sun because we are surprised that there is a likeness between the sun and the object of our love. Holy Scripture will use the metaphor, not primarily to give us pleasure like the poet does, but to make something known to us about God. The Scriptural metaphor points out a likeness between the creatures that we understand fairly well and the God who is so hard to understand. For example, Scripture calls God a rock. Literally speaking, God is not a rock, but the author of Scripture wants to convince us that, like a rock, God has stability, permanence, and endurance. And so the writer of Scripture makes known to the reader something about the nature of God using the metaphor which points out a likeness between God and creatures.

We might be tempted to confuse metaphor and analogy, but they differ in two ways. First, to say that a term is used analogously is to say that it is used twice and has two different but related meanings. A term used metaphorically need only be used once and it retains its common meaning. Second, the statements which use a term analogously state that the term actually belongs to both subjects, while the statement which uses a term metaphorically does not really state that the term actually belongs. For example, we said earlier that rhetoric is both part of and not part of logic. That is because we have given the term "logic" two different meanings, one of which truly includes rhetoric,

the second of which truly excludes it. When we say "Juliet is the Sun," the word "Sun" retains its first meaning but the statement is not meant to imply that the predicate truly belongs to the subject. It only means to point out the likeness between the subject and the predicate in a striking way.

We have talked about three tools of the lesser parts of logic: the enthymeme, the argument by example, and the metaphor. Though those tools are very weak tools and do not yield much certainty, they are very important to us, because of the weakness of the human mind almost more necessary to us than the syllogism. The human mind needs weak arguments like these before it can use the stronger ones.

Conclusion to the Course

I would like to finish by talking about what I hope that you can get from this logic course. There are, I think, three reasons why this logic class is important. First, from this class you should understand something of what philosophers and theologians are talking about when they use logical terms. Perhaps before the course you did not know what St. Thomas or Aristotle meant by genus, species, and difference. Now you do. Perhaps before you did not know what St. Thomas meant when he said that names are used analogously of creatures and God. Now you do. Perhaps before you did not know what exactly the word "syllogism" meant. Now you do. Just knowing what these terms mean should help you to understand better the philosophers and the theologians.

But I also hope that you will be able to use the logical tools themselves to understand the philosophers and theologians when you are reading their works. That is, you do not really understand a philosophical text unless you understand its logical structure. It makes a difference whether a theologian is using a syllogism that is meant to conclude with certainty or an enthymeme that concludes with probability. St. Thomas' own commentaries on Aristotle outline the logical structure of those books. He will write, "First Aristotle gives a syllogism; second, he gives an argument by example; third, he gives an enthymeme." I think that the tools covered in this course could be an important aid to your reading the philosophers and theologians with understanding.

Finally, I think that if you do the exercises that go along with this course, and get some practice in using these logical tools, your own thinking and your own writing will be improved. You will not only write and think with more force and certainty, but you will write in such a way that you will use the lesser tools like example and enthymeme in order to appeal to the beginners. Your thinking will become clearer and your writing will become an effective teaching tool.

Exercises

1. Construct four good arguments on the same subject. Make one a syllogism, the second an induction, the third an enthymeme, and the fourth an argument by example.
2. Identify whether the logical tool of discourse used by the author: syllogism, induction, enthymeme, argument by example, fallacy of equivocation, or fallacy of the accident.

Courage, when it is not wisdom but like a kind of recklessness, is harmful. The same is true of moderation and mental quickness; when they are learned and disciplined with understanding, they are beneficial, but without understanding they are harmful. Therefore, all that the soul does and suffers, if directed by wisdom, ends in happiness, but if directed by ignorance, it ends in the opposite. (Adapted from Plato, *Meno*, 88b - c)

The hare and the tortoise may differ in the quality of swiftness, but they must agree in the quality of motion. When we say that the hare moves faster, we say that the tortoise moves. Thus, even in the act of saying things change, we say that there is something unchangeable. (Chesterton, *Heretics*)

If then virtue is something in the soul that is always beneficial, and all the qualities in the soul that are always beneficial are wisdom, then the argument seems to show that virtue, being beneficial, must be wisdom. (Plato, *Meno*, 88d)

God's ability is pure, not tainted with any lack of ability. But prime matter is also pure ability, that is, pure potentiality. Therefore, God is prime matter. (David of Dinant, see St. Thomas, *Summa Theol.* I, q. 3, art. 8, co.)

To take a thing and make a joke out of it is not to take it in vain. . . . To use a thing in vain means to use it without use. But a joke may be exceedingly useful. (Chesterton, *Heretics*)

Just as in the law courts no man can pass judgement who does not listen to the arguments from both parties, so must a person whose task is to study philosophy place himself in a better position to reach judgment by listening to all the arguments. (St. Thomas Aquinas, *Commentary on Aristotle's Metaphysics*, Book III, lect. 1, n. 342)

America and Australia are new nations, and thus are vigorous, vital, and hopeful nations. (adapted from Chesterton, *Heretics*).