The Science of Logic
A Course in the Formal and Material Principles of Right Reason

INDEX Introduction to Philosophy

Formal Logic

- **b. The Divisions of Logic**
  - **i. The Art of Logic**
  - **ii. The Science of Logic**
    - **1. Formal Logic**
      - a. Formal Logic of the First Operation
      - b. Formal Logic of the Second Operation
      - c. Formal Logic of the Third Operation
    - **2. Material Logic**
      - a. Demonstrative Logic
      - b. Dialectic
      - c. Rhetoric
      - d. Poetics

2. Formal Logic of the First Operation of the Intellect

- **a. Simple Apprehension**
- **b. The Product of Simple Apprehension: The Concept**
  - **i. The Definition of the Concept**
  - **ii. The Divisions of the Concept**
    - **1. Considered Absolutely**
      - a. According to the Object
        - i. By Reason of Comprehension
          1. Incomplex
             - a. Divided by Reason of Separation
               - i. Concrete
               - ii. Abstract
             - b. Divided by Reason of Implication
               - i. Absolute
               - ii. Connotative
                 1) Essentially
                 2) Non-Essentially
          2. Complex
             - a. Divided by Reason of Separation
               - i. Concrete
               - ii. Abstract
             - b. Divided by Reason of Implication
               - i. Absolute
               - ii. Connotative
                 1) Essentially
                 2) Non-Essentially
        - ii. By Reason of Extension
          1. Singular
          2. Universal
             - a. Restricted
               - i. Determinate
               - ii. Indeterminate
             - b. Non-Restricted
               - i. Collective
               - ii. Distributive
                 1) Univocal
                 2) Analogous
                    a) By Intrinsic Analogy (proper proportionality)
                    b) By Extrinsic Analogy
                       i) Metaphor
                       ii) Attribution
      - b. According to Perfection
        - i. Infinite
        - ii. Finite
          1. Common
          2. Proper
             - a. Distinct
               - i. Complete
                 1) Simply
                    a) Apprehensive Only
                    b) Apprehensive and Comprehensive

2) Positivo-Negative
ii. Incomplete
1) Simply
2) Positivo-Negative
b. Confused
i. Through Accidents
1) Proper
2) Not Proper
ii. Through Extrinsic Causes
c. According to Origin
i. By Mediation
1. Mediate
2. Immediate
ii. By Presence
1. Intuitive
2. Non-Intuitive
iii. By Directness
1. Direct
2. Reflex

2. Considered Relatively

a. By Reason of Sameness and Difference
i. Identical
1. Strictly
2. Equipollently
ii. Diverse
b. By Reason of Inclusion and Exclusion
i. Impertinent
ii. Pertinent
1. Pertinent of Sequel
a. Convertible
b. Inconvertible
2. Pertinent of Repugnance
a. Negative Opposition
i. Contradiction
ii. Privation
b. Positive Opposition
i. Contrariety
ii. Relation

c. The Signs of the Concept: The Word

i. Signs in General

1. The Definition of Signs

2. The Division of Signs

a. Related to the Thing Signified
i. Natural
ii. Conventional
iii. Customary
b. Related to the Knowing Faculty
i. Instrumental Signs
ii. Formal Signs

ii. Signs used by Animals Specifically

1. Vocalized Signs

a. Definition of Vocalized Signs
b. Division of Vocalized Signs
i. Inarticulate
ii. Articulate
1. Insignificant
2. Significant
a. Absolutely Taken
i. On the Part of the Thing Signified
ii. On the Part of the Sign
1) Univocal
2) Equivocal
3) Analogous
b. Relatively Taken

i. The Enunciative Term
1) Categorematic
a) Noun
b) Verb
2) Syncategorematic
ii. The Syllogistic Term
1) Major Term
2) Minor Term
3) Middle Term

2. **Graphical Signs**
a. Definition of Graphical Signs
b. Division of Graphical Signs
i. Ideographic
ii. Phonographic
3. **Gesticulative Signs**

3. **Formal Logic of the Second Operation of the Intellect**
a. **Judgment**
b. **The Sign of Judgment: Oration, Speech, or Discourse**
i. **The Definition of Oration**
ii. **The Division of Oration**
1. **Imperfect**
a. **Not Leading to New Knowledge**
b. **Leading to New Knowledge**
i. Definition
ii. Division
2. **Perfect**
a. **Directs Others (ordinant or practical discourse)**
i. To be passive (vocative)
ii. To be active
1. To give information (interrogative)
2. To give work
a. In regard to inferiors (imperative)
b. In regard to superiors (deprecative/optative)
b. **Does not Direct Others (speculative discourse)**
i. Enuntiative Oration (the proposition)
1. Definition of the Proposition
2. Division of the Proposition
a. Division by Reason of Form
i. Simple (categorical)
ii. Composite
1) Openly
a. Copulative
b. Selective
i. Disjunctive
ii. Alternative
1. Exclusive
2. Inclusive
c. Sequential
i. Simple
ii. Reciprocal
2) Occultly
a. Exclusive
b. Exceptive
c. Reduplicative
b. Division by Reason of Matter
i. Necessary
ii. Contingent
iii. Impossible
c. Division by Reason of Quantity
i. Universal
ii. Particular
iii. Singular
iv. Indefinite
d. Division by Reason of Quality

i. By Reason of Conformity with Reality
ii. By Reason of Modality
1) De Inesse
2) Modal
a. Composite
b. Divisive

e. Division by Reason of Origin
i. Extrinsic
1) Natural
2) Supernatural
ii. Intrinsic
1) Immediate
a. Factually Evident
b. Self-Evident
i. In se
ii. Quoad Nos
1. Quoad Omnes
2. Quoad Sapientes
2) Mediate

3. Properties of the Proposition
a. Properties of the Parts of the Proposition
i. Supposition
1) Material
2) Formal
a. Simple (Logical)
b. Real (Personal)
i. By order to copula
ii. By extension
1. Singular
2. Universal
a.Distributive
i. Complete
ii. Incomplete
b.Collective
c.Particular
i. Determinate
ii. Indeterminate
ii. Reimposition
1) Real
2) Logical
iii. Amplification
iv. Restriction
v. Transfer
b. Properties of the Whole Proposition
i. Opposition
1) Contradiction
2) Contrariety
3) Sub-Contrariety
ii. Equipollence
iii. Conversion
1) Simple
2) Accidental
3) Contrapositive

ii. Argumentative Oration

4. Formal Logic of the Third Operation of the Intellect – coming soon...

Material Logic – coming next semester...

Prologue: What is Philosophy?

The Nature of Philosophy

According to Common Opinion

What is Philosophy? Is it a science? Is it a kind of poetry? Is it just a lower form of Theology? Surveying the various opinions about the nature of Philosophy reveals a term so widely abused that one is tempted to think that there is no such thing as Philosophy; that it is a myth as culturally specific as the boogeyman, occasionally popping out of dusty old closets to scare scientists and college freshmen. The special sciences today have so far rolled back the fog of the knowable universe that anyone who wants to breath the clear air of knowledge is told to take up instruments and measure something, while Philosophy is respectfully escorted to the deepest, darkest corners of your local cafe-bookstore—to be stumbled upon whenever political commentators go thumbing for useless rhetoric. When we think of philosophers we think of tussled hair, tweed jackets, and pipe smoke. But this is an image which, though eerily autobiographical, I must insist is a stereotype. Philosophy is not only scientific, it is the perfection of all sciences. And the philosopher is not only a crazy old windbag, he's the craziest of old windbags. But ridiculously well worth listening to.

According to Many Laymen

Most people outside the academic community use the term 'philosophy' to mean any sort of clever maxim, usually suggesting a rule for making decisions. Thus, someone will say, "well, *my* philosophy is seize the day." Which really just means, "I've decided that whenever I doubt the prudence of an action I will take the course which is more pleasurable and worry about the consequences later." Is this sort of axiomatic nonsense all that we mean by Philosophy? Go to any corporate website and you'll see something similar—it's usually on a page titled 'Our Philosophy'. But again all we really find on the 'Our Philosophy' page is a list of nice sounding words; words that potential customers would really like honestly to use if they ever had to describe their experience of this company to someone else: 'loyal', 'friendly', 'excellence', 'focus', 'commitment', 'innovation'. Potential customers then feel good about these words and decide to do business. Philosophy for the layman has become a catchall word for nonsensical drivel. But at least they respect it.

According to Many Scientists

Scientists, on the other hand, generally have a much lower opinion of Philosophy. Devoted to observation and experiment, most scientists view philosophy as dealing with the diametrical opposite of what they perceive to be true knowledge. They think Philosophy concerns things that cannot be observed, cannot be controlled, cannot be measured and tested. In other words, Philosophy has absolutely nothing to do with science. Even if it is considered to be a legitimate area of study, it most certainly is not science. We'll learn presently that the reason Philosophy is thought to be totally separated from modern science is because the whole of Philosophy has come to be identified with what is in reality only a part: namely, Metaphysics.

According to Many Philosophers

Philosophers are perhaps the worst people to ask if you ever want to know what Philosophy is. They cannot seem to distinguish between Philosophy and History. Philosophers today seem so utterly unsure that there is any true opinion that when you take a Philosophy course at most universities, you will be learning in fact the history of Philosophy. You will learn what Kant thought, or what Hegel thought, or what Plato thought, etc. etc. The one thing that you will not learn is whether or not any of these philosophers was right. You will be asked on every exam, "What did Kierkegaard think about such-and-such?", and you will be expected to quote book and chapter to prove that this is indeed what Kierkegaard thought. But you will not be asked (neither may you ask) "was it true?"

Unfortunately, most so-called Thomistic Philosophy programs are no exception. They do not teach Thomism, they teach the biography of St. Thomas. And the ultimate test for whether or not something is 'true' is whether or not you can find a quote somewhere in St. Thomas's works that *says* it is true.

So in academia, you've got the science department which thinks that Philosophy is too abstract and aloof to be scientific, and you've got the Philosophy department which thinks that Philosophy is too subjective to be certain; we can't really know for sure, so we must just be tolerant.

For my part, when I use the word 'Philosophy' I have a very strict meaning. And it is the traditional meaning used by the Greeks and accepted by the Scholastics. It is neither a mystical thesaurus of questionable maxims, nor the transcendental antithesis to scientific inquiry, nor history. But enough of what it isn't, let's take a look at what it is.

According to the Scholastics

Whenever we undertake to study something, we really ought to know at least in general way what that thing was; no one would ever set out to study the parts of a cleome unless he knew, at least in the vaguest fashion, what on earth a cleome was—if you can't point to a cleome, I don't know how you expect to study it. Hence, it makes sense that before we go on to study Logic, which is a part of Philosophy, we outline at least in a general way what Philosophy itself is. And

to know what a thing is, is to know its nature or essence, even if only in its most general characteristics—even if I only know that a cleome is that plant out in my garden with pink and lavender petals and long, spindly arms, I at least know something about its nature, albeit imperfectly.

Now, one of the things we'll learn in Logic is 'definition'. And one of the things that we'll learn about definition is that there are two types: nominal definition and real definition. Nominal definition does nothing more than single something out for us: a cleome, for example, may be defined as that plant out in my garden with such-and-such features. Again, a nominal definition of a square might be 'the shape of that building's face over there'. A real definition, as we'll learn, gives us some insight into the real nature of the thing; so a real definition of a square would be a quantity terminating in four sides of equal length, or something of the sort. So a real definition, properly done, gives us the nature of a thing by separating that thing from all others. Therefore, to give you insight into the nature of philosophy we'll look at its definition; first, its nominal definition, then its real definition.

Some writers don't believe that we should treat of the definition of philosophy at the beginning of philosophical studies. They hold, instead, that the definition of philosophy comes at the very end of our studies; as kind of a corollary to Metaphysics. They would argue that, for example, a real definition of 'man' cannot be given until you've studied man and his properties and can conclude to his real nature (his nature being, as I said, enshrined in the real definition). There is some truth to this, but we need to make a distinction. In the order of human discovery, yes, naturally the understanding of what man is and, in our present case, what philosophy is won't properly be a proven conclusion until all of its parts are distinguished and examined; but for the purposes of pedagogy, i.e., for the purposes of teaching new students, once we have the real definition it is better to share it with them at the outset to give them an idea of where their knowledge of the subject will be taking them—it's an aid and a courtesy to the students. The rest of their studies, then, will be a continuing proof of this definition. Besides, it seems a little ridiculous to have students talking about philosophy for years before anyone ever tells them what philosophy is.

The Nominal Definition

So let's start with the nominal definition and try to point out (from its name and etymologically) what the Scholastics hold philosophy to be.

The name 'philosophy', as is often pointed out, comes from the Greek, and it means 'love of wisdom', or 'philos' (love) 'sophia' (wisdom). According to Cicero, it was supposedly Pythagoras (the well known philosopher of mathematics) who first coined the term in response to his being called a 'wiseman'. Pythagoras pointed out (so Diogenes tells us) that only God is truly wise, whereas a person such as was he could only ever hope to be called a 'lover of wisdom'. Well, the name stuck. And philosophy came to mean the search for wisdom itself, but only insofar as this wisdom is accessible to rational human nature. That is, knowledge of reality insofar as man can attain by long, laborious, processes of observation, induction, and deduction;

philosophy is imperfect wisdom always in pursuit of perfect wisdom. Or in other words, philosophy came to mean knowledge tending toward a comprehensive grasp of all reality. "For while the ancients who pursued the study of wisdom were called sophists, i.e., wise men, Pythagoras, when asked what he professed himself to be, refused to call himself a wise man as his predecessors had done, because he thought this was presumptuous, but called himself a philosopher, i.e., a lover of wisdom. And from that time the name "wise man" was changed to "philosopher," and "wisdom" to "philosophy." This name also contributes something to the point under discussion, for that man seems to be a lover of wisdom who seeks wisdom, not for some other reason, but for itself alone. For he who seeks one thing on account of something else, has greater love for that on whose account he seeks than for that which he seeks."[1] So it was that philosophy used to mean *the entirety of human intellectual pursuits, always tending to a unifying vision of reality which is called 'wisdom'*.

Already, here with this first nominal definition we can see a huge divergence between what philosophy use to mean (i.e., all human knowledge as tending toward a complete understanding of reality) and the very miniscule role that philosophy is given today (i.e., empty maxims which cannot by verified by observation or experiment).

The Real Definition

How, then, are we really to define philosophy according to this older view? The most common way to define it is by saying that philosophy is the knowledge of all things through their first or highest causes. A noted philosopher by the name of Jacques Maritain has this to say in his celebrated 'An Introduction to Philosophy': "Philosophy is the science which by the natural light of reason studies the first causes or highest principles of all things—is, in other words, the science of things in their first causes, insofar as these belong to the natural order." And more often than not, this definition is given by most modern philosophers who claim to subscribe to the traditional view.

However, there is a huge problem with this definition: it identifies ALL of philosophy with what is but a single BRANCH of philosophy, namely, Metaphysics. Maritain knew that he was doing this, and he was explicit about it: "we shall take philosophy to mean philosophy *par excellence*, the first philosophy or Metaphysics." But how does he know that Metaphysics is philosophy *par excellence* until he can give a basic definition of philosophy in general? So he shirked the whole responsibility of giving an adequate definition of philosophy in general, and as a consequence an entire generation of Thomistic philosophers identified philosophy with Metaphysics.

Furthermore, this definition entirely contradicts the nominal definition that had been accepted by everyone since the time of the ancient Greeks. To possess Metaphysics, you see, *is* to be a wise man because it orders everything in light of their first and ultimate causes, as we'll learn at the end of this course. But the older understanding encompassed not only the actual possession of human wisdom, but also all those other fields of study which are directed toward that wisdom as their final goal. The common understanding today would entirely separate modern 'sciences'

[1] In I Meta., lect. 3, n. 56.

from philosophical investigation accept insofar as the conclusions of Metaphysics could be applied to them.

Finally, this definition would go further than just identifying all the branches of philosophy with Metaphysics, but it would also reduce all the branches of Metaphysics to the study of Natural Theology; because Natural Theology studies the First and Highest Cause of all beings. Because of this view, Thomistic Philosophy has today been completely divorced from any science which does not make explicit reference to God. Thus, the Thomistic philosopher Etienne Gilson held that all Philosophy is necessarily subordinate to Supernatural Theology, and all philosophic investigations must be studied in light of revealed principles. Well, since there's precious little way that modern science can be directly studied in relation to revealed principles, Philosophy for modern Thomists has very little to do—if not nothing—with empiriological sciences (i.e., sciences of experimentation).

So what then is the real definition of Philosophy? Well, according to the older view (and this is the sense in which 'Philosophy' will be used in this book) Philosophy refers to all possible reasoned knowledge put in order and directed to a complete, comprehensive grasp of reality. Hence, the real definition of such knowledge would be along the lines of this: Philosophy is the *synthesis, or complex, of all sciences which deal with beings knowable by human reason*.

Let's look at each part of this definition to help you understand it.

Philosophy is a s*ynthesis, or complex, of sciences*. Sciences are processes of reasoning which lead to true and certain conclusions from true and certain principles. Now, philosophy is not one particular science, but it is a whole which has particular sciences as its part. There are other complexes of science which are similar to this: math, for example, is not a single science, but it is a term for a collection of sciences contains underneath itself, namely, arithmetic (along with its kindred studies) and geometry (along with its kindred studies)[2]. Natural science, to give another example, is a single name which refers to all the sciences dealing with the natural order, and these sciences are its parts. So what 'math' is to the various mathematical sciences, Philosophy is to *every science possible to the unaided human mind*. It is a synthesis or complex or structure or system or totality or network of all the particular sciences as properly ordered amongst themselves. And so to be a philosopher as compared with being, say, a molecular biologist, is like being the captain of the ship as opposed to being, say, the guy down in the boiler-room. It is the captain who knows where everyone on the ship should be (and why), and it is the captain who knows where the ship is going. It is the philosopher who knows how all the sciences should fit together and to what end they are ordered. Now, knowing how one science is related to another is properly the work of the logician, as we shall see. Hence, philosophers must first, foremost, and forever be logicians. That is why Logic is of the utmost importance.

So Philosophy is not formally distinct from science. In fact, philosophy is the sum of all the sciences insofar as these sciences are properly ordered and subordinated amongst themselves. So

---

[2] That real mathematics is divided ONLY into arithmetic and geometry is something we will learn towards the end of this course in Logic.

when we speak of Philosophy, we are speaking of science. But note that Philosophy is not itself a science. In other words, the particular sciences, such as physics, math, metaphysics, ethics, etc. are not simply parts of a larger science which is called 'philosophy'. No, each one is a distinct science; Philosophy is the ordering of these sciences one to the other in a great logical structure, conglomeration, or synthesis. But we'll get deeper into this later.

Philosophy *deals with all beings*. Now, a being is anything which does exist or can exist; and existence is either outside the mind, or inside the mind only (so, for example, a horse with a long spiral horn on its head could possibly exist outside the mind, while, say, '-3' can only ever exist in the mind). So philosophy is concerned with every actual and possible being, whether it is a 'real being' or simply a 'being of the reason.' And it deals with these beings not only in their highest or ultimate causes (as the other definition insists) but also in their lower and proximate causes. Hence, the other definition (i.e., the science of things in their first causes) is formally included in what we understand to be Philosophy.

Philosophy *deals with all beings knowable by reason*. That's not to say 'all beings that can be reasonably or rationally investigated', but rather all beings that can be discovered and examined by unaided reason. In this way, Philosophy is distinguished from Supernatural Theology which takes its principles from truths which are inaccessible to human reason. So for example, that God exists is something knowable by unaided reason, as you'll discover when you advance in your courses. But the inner life of God (that God is Triune, for example) is not a truth that can be discovered by reason acting alone. Nevertheless, once Divine truth is revealed, we can certainly reason about that subject.

Perhaps now would be a good time to explore further the relationship between Philosophy and Sacred Theology, which is—as a conclusion to all we've said up to this point—really the distinction between rational human science and Sacred Theology. Perhaps no one so well summarized the distinction between the two as did the eminent Cardinal Mercier, a greatly esteemed Thomistic scientist (though often wrongheaded and certainly not infallible)[3] of the late 1800's. I quote him liberally:

"In the eyes of theologians philosophy is regarded as 'natural', in this sense that it deals with an order of knowledge to which man can attain by the light of unaided reason and is opposed to that order of knowledge which, because it surpasses the power and needs of created nature, is called 'supernatural'. The latter order of knowledge deals with the truths proposed to our faith by divine revelation and the profound study of this concerns not the philosopher but the Christian theologian. Yet that there is a certain connexion between human sciences and revealed truths we may see from the fact that both these natural and supernatural truths spheres of knowledge meet in the mind of the Christian scientist or philosopher.

---

[3] Though I will, indeed, often be citing His Excellency in this work because of his profound attempts to reunify philosophy and science, I would like it to be understood that I do not endorse his work in its entirety. In fact, quite often he missed the mark so widely that it's laughable to read him. For example, he believed that Logic, which teaches the method of procedure in the sciences, should actually be studied AFTER Metaphysics, which is the culmination of all scientific investigation.

"It is important to determine the relations between them.

"1) Philosophy, and hence science, is a study formally independent of all authority. Indeed, for the constitution of a science two things are essential: that it have certain principles and the means of drawing such conclusions from these principles as are contained by them in germ. All sciences have their own principles and distinctive methods. They deduce their principles from the analysis of a given subject-matter, which so analyzed discloses the existence of various relations; the simplest and most general of these furnish the formative principles of our knowledge. The mind recognizes these relations with certitude because they furnish their own evidence. When the combination of these simple relations leads the mind to more complex conclusions, it is precisely the evidence of the connexion between the latter set and the former that is the sole motive which induces the reason to assent to the results obtained by demonstration. Hence, the essential elements of science—principles, conclusions and the certainty of the evidence between them—are independent of all Church authority.

"This general argument is confirmed by the fact that science and philosophy existed before the foundation of the Church, and the Author of Christianity came not to destroy the natural endowment of man but to enrich it with better gifts. Moreover, when in the first half of the last century De Bonald and La Mennais sought to oblige the human reason to receive its first principles and its primary motives of certitude from revealed teaching, Gregory XVI, far from accepting this dutiful subjection offered to the Church, publicly reproved and condemned the mistaken loyalty of its authors.

"2) Are we to conclude that the Christian scientist and philosopher may show a complete disregard of the teachings of revelation? Certainly not, for the Church has received from God the deposit of revealed truths and it is her mission to it intact. Thus when in the name of science or philosophy the imprudent or the rash advance theories which contradict the teachings of revelation, the Church cautions those who trust to her for guidance, and denounces the error the acceptance of which would run counter to the belief in divine revelation. Her guardianship is thus negative and she herself does not *positively* teach either science or philosophy. She leaves entire liberty to those who study them, and history and individual experience testify to her zeal in encouraging them. She uses no voice of authority in such matters; men are left to their own reflection and research; her only authoritative mission is teach the dogmas of revelation. But such being her mission she cannot allow, still less approve, anything that may be detrimental to the divine teaching. As long as scientists and philosophers do not put themselves in opposition to what she knows to be revealed by God, and in consequence most certainly true, she respects the freedom of human learning; but when any one puts forward as science what is only mistaken conjecture, she calls for a revision of such hasty conclusions, and thus shows herself the helpmate of the human reason by her assistance in disclosing to it its errors.

"In short philosophy and the sciences are autonomous in this sense that in their case the supreme motive of certitude is the intrinsic evidence of the object they study, whereas in matters of faith the ultimate motive of belief is the authority of God, the author of supernatural revelation. Revelation is not a motive of assent, a direct source of knowledge for the scientist and the

philosopher, but rather a safeguard and a *negative* standard. The Christian philosopher from the moment that he undertakes his investigations has full liberty of interrogating nature or his own consciousness and of following the direction of his reason. But if it should happen that he finds his conclusions at variance with revealed truth as proposed to his belief by legitimate authority, he is bound alike in the interest of faith and of scientific truth to trace back his inquiries until his difficulties find a solution in accord with the teachings with which at first sight they seemed to conflict. Divine truth cannot be erroneous; whatever is a certain contradiction of a dogma certainly revealed cannot but be error and to repudiate error is surely an act of reason.

"3) But, it may be asked, if the case should arise of an evident contradiction between faith and reason, must we abdicate the rights of reason? We who are believers do not admit the possibility of such a contradiction. To answer the unbeliever, we must make an appeal to experience. Can he bring a proof, even a single proof, of a manifest contradiction between an evident truth of reason and a dogma of the Church? We confidently assert that there never has been found a manifest conflict between a dogma and a certain conclusion of science. Where discrepancies have arisen and doubts have been introduced they have always been the outcome of hasty observation, premature induction or ill-considered hypothesis, or, on the other side, of inaccurate definition of belief or the personal opinion of isolated theologians. When it is not immediately apparent wherein lies the explanation of a seeming disagreement between what is put forward as of faith and what is put forward as a scientific conclusion, the prudent and wise Catholic scientist will for the time suspend his judgment and await with confidence for the real truth to be brought to light.

"The Vatican Council sums up Catholic teaching concerning the relations of rational conclusions and revealed dogmas in these words: 'Although faith is above reason there can never be a true discord between faith and reason; for the God Who reveals mysteries and bestows the gift of faith is He Who has also illuminated the human mind with the light of reason; but we cannot find contradiction in God and neither can truth be opposed to truth. If the vain appearance of such contradiction should arise, this is either because the dogmas of the faith have not been understood and expounded according to the mind of the Church or because arbitrary opinion has been mistaken for judgment founded on reason."[4]

So in the light of what has been said we can come to a number of conclusions. First, Philosophy (and therefore each and every human science) is formally distinguished from Sacred Theology because Theology proceeds under the light of revealed principles. Philosophy, on the other hand, proceeds from natural principles; i.e., from principles gathered from experience and known by reason.

Second, Philosophy is distinguished from faith and opinion. "Faith implies assent of the intellect to that which is believed. Now the intellect assents to a thing in two ways. First, through being moved to assent by its very object...Secondly the intellect assents to something, not through being sufficiently moved to this assent by its proper object, but through an act of choice,

---

[4] A Manual of Modern Scholastic Philosophy, Volume 1.

whereby it turns voluntarily to one side rather than to the other: and if this be accompanied by doubt or fear of the opposite side, there will be opinion, while, if there be certainty and no fear of the other side, there will be faith.

Now those things are said to be seen which, of themselves, move the intellect or the senses to knowledge of them. Wherefore it is evident that neither faith nor opinion can be of things seen either by the senses or by the intellect."[5]

In other words, sciences, as we'll explain towards the end of this course, ultimately force the mind to assent to their conclusions because the intrinsic evidence is so obvious that the mind has no choice but to assent, under pain of contradiction. It excludes any relation to the will. Faith and opinion, on the other hand, always include a reference to the will in some way or another. The evidence given by the object of faith and opinion may sway the mind to believe it or doubt it, but ultimately it is the will which chooses to believe one side of an argument or another.

So to sum up, "Philosophy, in its widest meaning, comprises every single science; for it is called a kind of 'love' 'or 'friendship of knowledge' for which reason human wisdom is called Philosophy by St. Thomas in his introduction to his commentary on the Ethics. And thus Philosophy is a generic knowledge comprising under itself every science which can be naturally acquired, especially the speculative sciences [i.e., sciences which study things that man does not create; we'll examine these later], the love of which is properly called the 'love of knowledge' because they are loved for the sake of knowing alone."[6] This is what Scholastics mean when we use the term 'Philosophy'. Every science that man can study falls under it.

Now, when a thing by nature grows and develops, we understand it better by examining its natural tendencies. From its natural tendencies, we can reason to where it is trying to go. By studying the growth of a plant, say, for example, our old acquaintance the cleome, we can form an idea of what a perfect cleome should look like once all its growing is finished. Now, sciences develop in the intellect just as plants develop and grow in the soil. So to better understand Philosophy—and, most especially, to understand what perfect Philosophic Science should look like—let's examine how it is formed within the human mind and see if we can discover what it should look like when it is fully developed.

All animals have senses. However, some animals only have a few senses, while other animals have all the senses. An oyster, for example, has the sense of touch, which is a fundamental sense and is found in all animals; but it does not have memory. In fact, it doesn't need memory because it doesn't need to seek things out for its survival and nourishment. Other animals, though, do need to seek things out and make provisions for the future, as a squirrel needs to store its food for the winter. These animals are endowed with memory. And because they have memory they can acquire a certain habit of association which resembles learning. Thus, an animal who has been shocked a number of times by an electrical fence will associate a certain

---

[5] II-II, q. 1, a. 4, c.

[6] John of St. Thomas, Cursus Philosophicus Thomisticus, Vol. 2

visual object (namely, the fence) with an unpleasant sensation; and since natural desires compel the animal to flee what is unpleasant and seek out what is pleasant, it will avoid what resembles its past unpleasant experience.

Man, however, can go far beyond this association. From a number of catalogued experiences in his memory and imagination, man can abstract universal notions. While the animal sees the fence and feels the pain, man can abstract the notion of 'fence', of 'pain', of 'electricity' of 'causality' (e.g., the electricity in the fence CAUSED my pain). Man can understand universal notions, while animals understand only the particular things of sense. This understanding of universal notions is the distinctive feature of the intellect.

But even beyond merely understanding these universal ideas (e.g., the ideas of 'electricity' and 'pain'), man can induce propositions from his many experiences (e.g., 'electricity can cause pain'). And then from these propositions, man can arrive at new knowledge which is potentially contained in the old (e.g., 'What has electricity running through it can cause pain; but this fence has electricity running through it; therefore, this fence can cause pain'). This is the process of reasoning which is distinctive to man.

Now when an object is presented to man, he cannot grasp everything about it at in a single glance. Instead, he examines various noticeable features of the thing one by one. When the mind sees a certain rock, for example, it doesn't know everything about that rock but must content itself with examining its attributes singly. It looks at its color, its hardness, its weight, perhaps even its ability to conduct electricity. Each of these attributes goes to making up man's idea of this particular kind of rock; these various intelligible objects we are going to call 'notes' throughout this course. Each of these notes is abstracted from the rock which is sensed, and each note is separated from all the others so that the mind can examine them. But if they were kept separated one from the other, then the mind wouldn't have knowledge of reality; after all, these notes don't exist separately (they are combined in the rock), they are only considered separately by the mind. So the mind, in order to know reality, must unite all these various notes which it has grasp into a single concept: namely, the concept of the rock. So the mind first distinguishes, then unites. All the notes that make up the concept of the rock (that is, all of the notes taken together) constitute what we will call our comprehension of the rock (from 'cum-prehendere' or 'to grasp together'). We will discuss this thoroughly later on. The point to understand here is that by the simplest notions, we come to understand the most complex objects. And from these simple notions, we gradually build up our knowledge of real things.

Sciences come about when our will, by its power to control the other faculties of our body, turns our mind to one particular object and concentrates our thought on it. So, for example, concentrating our mind on the various notes of rocks and minerals, and gradually perfecting our comprehension of them, will give us geology. Concentrating on cataloguing the various properties of the cleome and other plants will give us botany. But no science of this sort can ever go beyond that proper object which it studies; the botanist will never become the geologist as long as his mind is directed to plants. The botanist, as a botanist, has only the most limited kind of knowledge of reality. But the mind does not rest in this. Everything, you see, is naturally

inclined to its proper operation—heat is naturally inclined to diffuse itself, plants are naturally inclined to grow—and it will pursue that operation even when inhibited—e.g., you can't stop a plant from *trying* to grow except by killing it. Now, the proper operations of the intellect is to understand reality. And as we said, understanding for the intellect is not simply knowing something in its various intelligible parts, but it is comprehending all those parts in a unified whole; its putting back together all the parts that is has separated. Even if the mind possessed a vast knowledge of all the various particular sciences, it wouldn't rest until it put all those particular sciences into a unified and systematic whole; this is the mind's natural tendency to find a unified, comprehensive, systematized vision of all reality. This systematization is called Philosophy, and its tool is called Logic.

Now, science is not *simply* a cataloguing of the various attributes of objects and reality. That would only be preparatory to science. Science seeks the principles, causes, and reasons of what it observes. Since the mind necessarily grasps the notion of causality (as we'll learn later), it necessarily asks of everything, 'why?' And it asks this because in knowing that there must be a cause, while at the same time not knowing what that cause is, it knows that it doesn't have a unified vision; and as I said, the mind naturally seeks this unity. In other words, the mind naturally flees ignorance; but when it doesn't know a cause while knowing that there *is* indeed a cause, the mind knows itself to be ignorant.

We express causes very frequently. Every time we say 'because' we are leading the mind to a cause. Why is grass green? Because it contains chlorophyll. This doesn't seem very significant, but that's because we've yet to examine the power of what is called the 'syllogism' (one of the primary focuses of this course). This explanation of why grass is green actually contains an abbreviated syllogism. If we blow it up and make explicit the syllogism which is now only implicit, we get:

Everything which contains chlorophyll is green.
But grass is something containing chlorophyll.
Therefore, grass is green.

Hence, the notion of containing chlorophyll is the 'middle term', or the unifying idea by which 'greeness' is united to 'grass'. Chlorophyll is the principle of greeness in the grass; it is the cause of greeness in the grass, and it is the reason why the grass is green. The purpose of each science is to seek out these unifying terms in their own particular subject areas. That is, every science seeks out the principles, reasons, and causes of the subject it is studying.

Now, principles, reasons, and causes do not mean the same thing. 'Principle' is a very broad term that means only a beginning or rather that from which a thing proceeds in any way at all; so the kitchen is a principle of my motion into the living room because I started in the kitchen. Nevertheless, 'being in the kitchen' is not a *cause* of my being in the living room. A cause is something upon which another depends for its continuing existence or for its coming into existence. Thus, the movement of my legs is a cause of my moving into the living room. While it is true that every cause is at the same time a principle, it is not true that every principle is at the

same time a cause. If a cause is removed, the effect is removed. If my legs don't move, neither do I. But the same is not necessarily true of a principle. Even if the kitchen were turned into, say, the dining room, my motion would remain what it is. Science must distinguish between what is truly a *cause* of a thing, from what is merely a *principle* or, in other words, from a phenomenon which just happens to occur first.

Now, when a cause is considered in relation to the mind, we call it a reason. The reason why the grass is green is the fact that it contains chlorophyll. The reason why a triangle has three interior angles equal to two right angles is because of the very nature of a three-sided plane figure, etc.

We won't be discussing causes again until we treat of reasoning processes much later on in this course. But I'd like to introduce you to the four chief kinds of causes right now so that we might forestall any future difficulties.

A cause, as I said, is a principle in virtue of which a being exists or comes into existence. A cause is the reason why a thing is what it is.

1) *The Formal Cause*: Think of a statue. Let's say a statue of Aristotle. Then ask yourself, what makes this statue to be a statue of Aristotle and not a statue of, say, Plato. You might answer that the statue of Aristotle is smarter (and I'd probably agree!), but that's beside the point. What makes this slab of clay to be Aristotle is that it has been shaped into the form of Aristotle and not the form of Plato, or Socrates, or anyone else. This principle by which the shapeless clay is made to be this or that thing and distinct from everything else we call the *formal cause*. Whenever this formal cause is altered, it becomes something different—e.g., it ceases to be Aristotle and becomes someone else. But notice that the clay itself has its own form independent of any other form superadded to it; e.g., independent of the form of Aristotle or Plato. In fact, the clay would be what it is (i.e., clay) even if it was never shaped into a statue. The form of statue is not necessary for clay to be what it is. Hence, we say that the form which is imposed on the clay is accidental to the nature of the clay: it is an *accidental form*. The clay itself is, however, not an accident of something else, but is a specific kind of thing which exists as a thing independently of another subject into which it is received; in other words, the clay is a substance. And the formal cause of the clay itself (i.e., its 'clayness', if you will) is what we call a *substantial form*. So the clay is a substance, and the form given to the clay is an accident. And for any given substance, there can be almost endless varieties of accidents; the clay can be Aristotle or Plato or Apollo or it can be white or red or hard or soft, etc. etc.

2) *The Material Cause*: The form of Aristotle does not exist by itself. It's not floating around somewhere and waiting for someone to shove it in the clay. It only exists when it is brought out of the clay by gradually molding the clay into the desired form. The clay itself is that *out of which* the statue of Aristotle is made, whereas the form of Aristotle is that *by which* the statue is this particular statue of the Philosopher. There is a real dependence of the form of Aristotle on the matter of the clay. If the clay starts to disintegrate, the form would disappear. Moreover, the matter (e.g., the clay) can receive many, many different forms, though not at the same time: it can be a statue of Aristotle at one moment, and then it is molded down and becomes a statue of

Plato. So we have discovered *matter* which is that cause from which a thing is made since it exists in it. And have *form* which is the cause which determines and specifies the material cause.

Is that it? Nope. The clay can't give to itself the form. If it could, that would mean that the clay already has it (because you can't give something that you don't have) and hence the clay would both have the form and not have the form at the same time. So we need another cause.

3) *The Efficient Cause*. This would be the sculptor in our example. The efficient cause is the principle from which the motion that united the form to the matter (e.g., the form of Aristotle to the clay) first proceeded. Matter and form are never united except under the influence of an efficient cause (because the matter cannot give itself the form, as I said, and the form doesn't exist before it's united to the matter, as I said).

4) *The Final Cause*. The sculptor never acts without a reason. Maybe it was to make money, maybe it was for the sheer pleasure of sculpting, maybe it was just to do something rather than to do nothing! The reason that the sculptor sculpted is what we call the final cause. But we need to make a distinction here between the final cause of the worker and the final cause of the work. Let's take another example: scissors. The guy who makes scissors at the scissor factory has perhaps one goal in mind: to make a living. That is the final cause of his scissor making. But the scissors themselves also have a final cause: namely, to cut. Likewise, the statue of Aristotle has its own final cause: to be a good representation of Aristotle. Everything has a final cause, as you'll learn much later. What is the final cause of a cleome? To do all those things that a cleome is supposed naturally to do. For now, it's just important that you understand a final cause to be that for the sake of which a thing is or comes to be.

The material and formal causes are called *intrinsic* causes because as long as the statue exists, it will have matter arranged in some form. If the form disappears, it's no longer a statue, just a chunk of clay. And if the clay dissolves, the form of Aristotle goes with it. The efficient cause and the final cause, on the other hand, are called *extrinsic* causes. It's not always necessary that these two exist. Even if the cleome hasn't yet grown up to its full stature (part of its final cause), the cleome still exists. And even if the sculptor is long dead, the statue still remains.

To study all of these causes is the business of the sciences; each one focusing on the causes of its particular subject-matter. But sometimes, one scientific subject-matter will depend on another. For example, molecular biology will depend upon certain conclusions laid down by chemistry and general biology; in other words, the causes which the molecular biologist seeks are actually the subject matter of a higher area of study. Hence, molecular biology is an area of study which is necessarily placed under more general areas of study. And when the whole conglomerate of these sciences, the whole ordering of scientific subject matter, is placed and approached and studied in the proper order, we have Philosophy. For the Scholastic, there is no distinction between knowing philosophically and knowing scientifically. Philosophy is just a general name that refers to the general rational, orderly, scientific inquiry into the causes of reality. For the Scholastic, every scientist is a philosopher; it's just that most of them today happen to be bad philosophers.

The Historical Origin of Philosophy

So, how is it that Philosophy today has come to mean anything but a systematic scientific inquiry into reality? Well, we've already dealt with one of the underlying causes, although only in passing: namely, the identification of Philosophy with only one branch of philosophical science, Metaphysics.

Now, we ought to bear in mind that a study of the history of Philosophy does not pertain to the philosopher properly speaking; rather, it pertains to the historian. In the same way, no one would fault a medical doctor for not knowing the old practice leeching. In fact, most of us might be grateful that he had never been trained in such things. Besides, history, as we'll learn in the course is a science only in the loosest sense of the term.

Nevertheless, seeing how Philosophy came to be regarded as a useless abstract will help us to avoid those opinions which lead to unhappy conclusion. So I'll present to you here a brief outline of the history of philosophic science with a special emphasis on why modern philosophy is, lamentably, modern philosophy.

Philosophy for the Greeks (six centuries before and six centuries after Christ)

The earliest Greek philosophers are also recognized as being the first scientists; this makes sense, of course, in the light of everything we've spoken of up until now. For them to be what we call today a scientist was to philosophize. Their chief concern was to investigate the causes of change in the external world and to discover what was the common element underlining the constant flux of reality. It was in this time period that the modern theory of atomic composition was first found in germ; pretty advanced stuff for lofty, head-in-the-cloud philosophers, indeed. There was no question that what they were studying was the reality that presented itself to our sensation, even if some of them ended up trying to deny that what they sensed was actually as things are. But little by little they started to inquire about things which were not so immediately evident to the senses; they began to wonder about celestial composition, phases of the moon, and in the end the entire arrangement of the universe as an ordered whole.

Generally this period of science is arranged in four periods: the Pre-Socratic (i.e., before Socrates), the Socratic (including Plato and Aristotle), the Post-Socratic until the rise of Neo-Platonism, and the Neo-Platonic.

The first question of the Ancient Greeks, as I said, was about the ultimate element from which the world is made; the 'material cause', to use the language to which you have now been introduced. Thales, who is recognized as the first scientist-philosopher, believed that the ultimate element was water; Anaximenes and Diogenes thought that it was air; Heraclitus thought that is was fire; Empedocles thought that it was fire, air, earth, and water (the infamous 'four elements' which were a precursor to modern elemental chemistry); Anaximander thought it was infinite matter; and Anaxagoras thought that a conglomeration of infinitesimally small

particles made up of all different substances on Earth comprised all things, and were arranged in various patterns by an immaterial intelligence.

The question of the ultimate material cause (to use our own language) led to the question of change, or rather the constant succession of formal causes (again, to use our terms). Where did the statue in the clay come from? It couldn't have come from the statue, because then it would have already been there and, hence, there would have been no change; but also it couldn't have come from nothing, because nothing comes from nothing. To solve this, Heraclitus taught that all things are in constant motion and there is no stable formal cause in the clay, or in anything else, for that matter. The Eleatic school, on the other hand, led by Zeno, Xenophanes, and Parmenides (to name a few), held that all change must be an illusion. And they went to very great lengths to show that all suppositions that things change leads to contradiction.

Now, while the first scientists were heavily debating the external world, a group of skeptical thinkers pointed out that the thinking subject, the person, was being ignored in their investigations. They were known as the Sophists, and they attempted to show that all inquiry into the physical world led to the destruction of knowledge; hence, we ought not even try to know truth from falsity, right from wrong. Chief among them were Protagoras and Gorgias.

In response to the scientific devastation wrought by the sophists, Socrates taught that proper grounding in concepts and scientific definitions was paramount. He returned to the scientific community determinate objects of investigation and he restored the dignity of the intellect. We have no works written by Socrates himself; instead, his teaching is relayed to us through his disciple, Plato.

Plato once again took up the question of change and stability in the observable world. But to solve it, he posited the existence of two different realities: one of sensible things which are in constant motion, and another a world of ideas which are stable and universal. All the things of sense are but mere participations in the eternal ideas. The human soul, Plato taught, existed before it was joined to the human body, and in this pre-corporeal state it contemplated the eternal ideas. All knowledge, then, of the sense world is but a remembering of what the soul saw in a previous type of existence.

The greatest disciple of Plato—and perhaps the most influential figure in all philosophic history—was Aristotle. He was a scientist beyond compare and he did more than any before him to synthesize all the scattered truths contained in the earlier philosophers. He devised the four causes (to which I have already introduced you), he formulated the notions of act and potency (about which you will read a great deal), and most importantly for our course in Logic, he was the first to systematize the acts of the intellect and deduce the rules for proper thinking and reasoning.

After the death of Aristotle, scientists directed much of their attention away from the external world and concentrated on moral philosophy. Leaving speculative science aside and focusing almost entirely on deriving rules of behavior, the four most recognizable schools of this time—

the Peripatetic School, the Stoic School, the Epicurean School, and the platonic New Academy—eventually devolved into a new type of skepticism.

Next came the Neo-Platonic period which was to nearly bankrupt Greek science and profoundly influence the early Fathers of the Catholic Church. Focusing on religion and the spirituality of man, the Neo-Platonists admitted a kind of immediate communication between the human soul and the unfathomable, unknowable inner life of God. This interchange is brought about by means of mystical intuitions and poetical ecstasies which defy the use of logic. There is an easily recognizable similarity between the neo-platonic movement and the modern existentialist revolt. Plotinus and Porphyry were two of the leading figures of this time.

Philosophy for the Church Fathers (from the time of Christ to the seventh century)

When the Fathers spoke on philosophic and scientific matters, it wasn't for the sake of science itself, but for the purpose of defending the dogmas of Faith and reconciling the apparent inconsistencies between pagan wisdom and revealed truth. Hence, most of their works in philosophy took over the prevailing neo-platonic doctrines in defense of Catholicism.

During the time of the Anti-Nicene Fathers we encounter the great apologists Justin Martyr, Irenaeus, Tertullian, Clement of Alexandria, and Origin. Among the Greek Fathers we find Athanasius, Basil, Gregory of Nyssa, John Chrysostom, and Cyril of Alexandria.

Saint Augustine was by far the most learned and prolific of all these Fathers. But he never approached systematic and scientific inquiries into reality. It is impossible to compare his works to those of the philosophic scientists before him or after him: theirs were systems, his was not. Augustine never left the domain of faith and utilized whatever philosophy was available to him for the purpose of apologetics.

Philosophy for the Medievals (from the seventh century to the fifteenth century)

Anyone who wishes to understand Medieval philosophy must understand several important distinctions. First, Medieval philosophy and Scholastic Philosophy are not the same things. While it is true that Scholastic Philosophy had its strongest impetus during the Medieval period, there were numerous other philosophical systems in both the East and West, all vying for the spotlight. Hence, a proper analysis of Medieval scientific systems must be divided into a study of Scholastic systems and a study of the opposing non-Scholastic systems.

Also, we must make a very clear distinction between Scholastic Philosophy and Scholastic Theology. It is one of the greatest historical injustices ever perpetrated that a philosophy proper to Medieval Scholasticism has been denied by modern scholars. The confusion stems from a misunderstanding about the subordinate role that philosophy takes in explaining the dogmas of Faith. But on this distinction between science and philosophy, I've already written at length above.

Scholastic Philosophy

There's little need to discuss Scholastic Philosophy much here, since all that you will be learning in this course is Scholastic Philosophy! But let me at least point out some of the causes which made this period especially fruitful in the domain of science. First, the works of the Greek philosophers—most importantly, those of Aristotle—were finally translated into Latin and diffused among scholars of the Western world. This was accompanied by the commentaries on Aristotle by the great Arabian scientists of the East. Among the most prominent were Alfarabi, Avicenna, and Averroes. The neo-platonic commentaries of Averroes would lead to one of the most controverted (and condemned) philosophic positions of the era: Latin Averroism. The most dangerous theory put forward by the Latin Averroists (and a theory which was introduced by the Islamic Averroes himself) was that of the 'two-fold truth'. According to this theory, what is true in Philosophy can be false in Theology, and what is true in Theology can be false in Philosophy. In other words, there can be a valid contradiction between Faith and science. Such an opinion was necessary for Averroes given the multifarious absurdities in the Islamic faith, but it was unacceptable for Christianity which held that it was the same God who created the universe as gave Divine Revelation; and there can be no contradiction in God. But this isn't to say that the 'two-fold truth' was the only danger of this system. Latin Averroism also denied personal immortality, the creative act of God, the individuality of the human intellect, etc.

Besides the introduction of the Greek works and the Arabic commentaries, the development of the great European universities was perhaps the most important factor in Medieval philosophic development; many of these universities, such as the University of Paris, still exist today. Finally, the foundation and growth of the Mendicant Orders must be marked also among the great causes of Scholastic growth; first and foremost among these Orders is to be placed the Dominican Order with its heavy emphasis on knowledge and truth. Thomas Aquinas was a product of the Dominican Order.

Non-Scholastic Philosophy

Non-Scholastic philosophy was more prevalent than was pleasant in the Middle Ages. From the pantheist neo-Platonism of John Scotus Eriugena, Bernard of Tours, and David of Dinant to the Jewish, Persian, and Syrian philosophy of the East, to the Latin Averroism of Siger of Brabant, to the rationalism of Raymond Lully and many, many others, Scholasticism and its ideal of science was far from triumphant during this period. In fact, the proliferation of non-Scholastic and profoundly irrational systems of philosophy—systems which were manifestly false in light of the new experimental techniques being developed—were one of the greatest causes of the Enlightenment's rejection of the old doctrines.

Philosophy During the Renaissance

The collapse of the Byzantine Empire, the revolt of the Protestants against the Catholic Church and the ideological rejection of her schools (including Scholasticism), and the resurrection of unadulterated Greek thought in all its rhetorical form was fatal for Scholastic science; Scholastic science which was, by its own fault, becoming corrupted and tedious. The Scholastics of this period were locked in endless dialectical debate about the most insignificant subjects, ever

driving themselves from contact with new innovations. The universities became lazy and couldn't compete with the rise of new schools. And the humanists perverted the Scholastic synthesis into a degraded and eclectic Platonic-Aristotelianism. That's not to say that there weren't bright spots. Indeed, proper Scholasticism was still growing, though at an impeded rate, in France, Portugal, and Italy. In fact, some of the greatest Scholastic Thomists were to be found during this period: Ferrariensis, Cardinal Cajetan, Francis of Vittoria, Melchior Cano, Banez, and the inimitable John of St. Thomas.

Philosophy for the Early Moderns

As decadent Scholasticism and neo-Platonic humanism took center stage, declaring themselves to be 'Philosophy', it's no wonder that in the time of Descartes and Francis Bacon we begin to see the first real wedge being driven between science and philosophy. Philosophy was being identified with the abstract and unattainable, the rhetorical and poetical, the lofty and intangible; while science, utilizing new techniques in induction and controlled experimentation, was holding itself to the ideal that we can only be certain of things which can be directly observed by the senses. Playing into the trap, philosophers came to equate all of their speculations with Metaphysics, such that by the time of Christian Wolff, philosophers were regarding all philosophy as a contraction or I should say and application of Metaphysics to some particular subject-matter.

But it wasn't until Kant came along that the divorce of Philosophy from science was inevitable. In his Critique of Pure Reason, Kant played on popular sentiment and explicitly identified non-experimental science with Metaphysics; and Metaphysics was being taken as the whole of philosophy. He then tried to show, in far too many words, that the subject of Metaphysics was entirely unknowable by the human mind. Unfortunately, many believed him. From that point on, Philosophers were effectively barred from the laboratory. Philosophy would no longer play any significant role in the scientific community. Philosophy and science were two separate disciplines.

Philosophy for the Contemporary Moderns

The split of Philosophy and science haunts us to this day. And the problem is ever worsening. In fact, with the rise in subjectivist systems, Philosophy itself is no longer being considered a discipline at all; even among so-called philosophers! Instead, Philosophy is being treated as though it were history. And the study of Philosophy is but the biographical overview of all those thinkers whom the scientific community refuses to accept as their own. We are not allowed to say that a certain philosopher was right or wrong, we are allowed only to explain what they taught and search for new interpretations of their texts. Even in Thomistic circles, Philosophy has nothing to do with science; it is merely, as I said before, the biography of St. Thomas. Thomists have become textual exegetes, busying themselves with new translations of his texts, and worrying about what it is that Thomas 'really meant', instead of asking themselves, 'is it true?'! Philosophic Science is, for all intents and purposes, dying.

The Neo-Scholastic Revival

An attempt to restore Scholastic Thomism and reconcile Philosophy with the partial sciences began in 1879 under the auspice of Pope Leo XIII after the publication of his encyclical Aeterni Patris. This movement was known as the Neo-Scholastic Revival. In the Encyclical, the saintly Pontiff wrote:

"Among the Scholastic Doctors, the chief and master of all towers Thomas Aquinas, who, as Cajetan observes, because "he most venerated the ancient doctors of the Church, in a certain way seems to have inherited the intellect of all."(34) The doctrines of those illustrious men, like the scattered members of a body, Thomas collected together and cemented, distributed in wonderful order, and so increased with important additions that he is rightly and deservedly esteemed the special bulwark and glory of the Catholic faith. With his spirit at once humble and swift, his memory ready and tenacious, his life spotless throughout, a lover of truth for its own sake, richly endowed with human and divine science, like the sun he heated the world with the warmth of his virtues and filled it with the splendor of his teaching. Philosophy has no part which he did not touch finely at once and thoroughly; on the laws of reasoning, on God and incorporeal substances, on man and other sensible things, on human actions and their principles, he reasoned in such a manner that in him there is wanting neither a full array of questions, nor an apt disposal of the various parts, nor the best method of proceeding, nor soundness of principles or strength of argument, nor clearness and elegance of style, nor a facility for explaining what is abstruse.

"Moreover, the Angelic Doctor pushed his philosophic inquiry into the reasons and principles of things, which because they are most comprehensive and contain in their bosom, so to say, the seeds of almost infinite truths, were to be unfolded in good time by later masters and with a goodly yield. And as he also used this philosophic method in the refutation of error, he won this title to distinction for himself: that, single-handed, he victoriously combated the errors of former times, and supplied invincible arms to put those to rout which might in after-times spring up. Again, clearly distinguishing, as is fitting, reason from faith, while happily associating the one with the other, he both preserved the rights and had regard for the dignity of each; so much so, indeed, that reason, borne on the wings of Thomas to its human height, can scarcely rise higher, while faith could scarcely expect more or stronger aids from reason than those which she has already obtained through Thomas.

"While, therefore, We hold that every word of wisdom, every useful thing by whomsoever discovered or planned, ought to be received with a willing and grateful mind, We exhort you, venerable brethren, in all earnestness to restore the golden wisdom of St. Thomas, and to spread it far and wide for the defense and beauty of the Catholic faith, for the good of society, and for the advantage of all the sciences. The wisdom of St. Thomas, We say; for if anything is taken up with too great subtlety by the Scholastic doctors, or too carelessly stated-if there be anything that ill agrees with the discoveries of a later age, or, in a word, improbable in whatever way-it does not enter Our mind to propose that for imitation to Our age. Let carefully selected teachers endeavor to implant the doctrine of Thomas Aquinas in the minds of students, and set forth clearly his solidity and excellence over others. Let the universities already founded or to be founded by you illustrate and defend this doctrine, and use it for the refutation of prevailing errors. But, lest the false for the true or the corrupt for the pure be drunk in, be ye watchful that the doctrine of Thomas be drawn from his own fountains, or at least from those rivulets which, derived from the very fount, have thus far flowed, according to the established agreement of learned men, pure and clear; be careful to guard the minds of youth from those which are said to flow thence, but in reality are gathered from strange and unwholesome streams."

His call to intellectual arms was well heeded in some countries, and Scholasticism began once more to flourish in the universities. Among the ranks of the Neo-Scholastics we count Gredt, Hugon, Zigliara, Taparelli, Sanseverino, Pesch, Lorenzelli, Mercier, Cornoldi, Liberatore, Urraburu, Kleutgen, Matussi, and many, many others. Unfortunately, the great strongholds of Neo-Scholasticism were left barren by two world wars, and the last authority of this movement was wiped out by Modernist professors and clergy who had infiltrated the Catholic Church.

Whatever hope there was to reconcile Philosophy with the sciences, has been severely weakened by the obliteration of the Neo-Scholastic movement.

The Division of Philosophy (i.e., the division of the sciences)

So, now that we've given the general definition of Philosophy, and now that we've seen, historically, why this definition is no longer the standard one in use, we are going to move on to enumerating the parts of Philosophy. And since the parts of Philosophy are, as we talked about above, the sciences themselves, the division of Philosophy is really the division of the human sciences. Now, it's impossible in this introductory session to give a complete division of all the sciences; that will have to wait until later. Besides, dividing the sciences in their entirety will be one of the last conclusions of Logic, as we'll see.

Sciences can be divided according to the objects with which they deal—and this would be to divide them in virtue of themselves, or formally—or they can be divided according to the order in which we should learn them—that is, in relation to ourselves. So let's look first at how the sciences are divided according to themselves, then according to how our mind should acquire them; keeping in mind that all of this will be dealt with in much greater detail at the end of our course.

In Itself

We can divide sciences according to their purpose, or rather their final causes (that for the sake of which they are acquired), and we can divide them according to their subject-matter, or rather their material cause.

By Reason of Purpose

Properly speaking, the end or final cause of all scientific knowledge is the contemplation of truth. And the intellect rests in this knowledge. This is called *Speculative Science*. It has as its end simply the contemplation of the truth attained. However, the intellect can also extend its knowledge in order to direct that something be done or made. When what is considered is not the nature of a thing in itself and absolutely, but how a thing is to be brought about, we have *Practical Science*. So, for example, when I study the nature of a healthy man, I'm studying a thing that already exists in reality without a view to creating it myself; this is a speculative science called Anthropology. If, however, I'm trying to determine what course of action I should take here and now in order to make this man healthy, I'm studying something that doesn't actually exist (i.e., this man is not actually healthy) but which I want to cause in reality (i.e., I want to *make* him healthy); this is a practical science called medicine. Both speculative and practical sciences study causes; however in the former we're studying the causes which are actually present, while in the latter we're studying the causes which *should* be present in order

that some goal be achieved (e.g., the causes which need to be present in order for this man to become healthy).

To put it another way, speculative science remains in the mind contemplating, while practical science extends to the direction of other parts of the body. And it can do this in two ways. First, the intellect can extend this knowledge in order to create something distinct from ourselves—and this we call Art—or it can extend its knowledge in order to direct the will to act morally—this we call Prudence. So the first division of Philosophy is into Speculative Philosophy and Practical Philosophy. Practical Philosophy is again divided into the Arts and Prudence.

Now, Speculative Philosophy considers everything that man can observe in reality. So how are the various speculative sciences to be divided? To give a full explanation at this point in our study would be very difficult—we'll cover this in depth only at the end of the course—but for now let me put it this way: sciences differ one from another because of a difference in objects. An object is that which is first and fundamentally impressed on a knowing faculty. For example, 'color' is the object of sight because it is what is first visible to us, and it is by means of color that we see everything else such as size and shape; if a thing had no color (i.e., if it didn't reflect light), we wouldn't see it. Again, the object of hearing is sound; if a thing didn't resonate, we wouldn't have any auditory knowledge of it. Now, every new and different kind of object determines or specifies a different kind of knowing. That is, formally different kinds of objects distinguish formally different kinds of knowledge. So because 'color' is formally different from 'sound' we can distinguish two different sensitive faculties; namely, sight and hearing. And it is *only* because we can observe different objects that we are aware of different powers. Thus, a man born without a sense of smell would never think to ask about smells until he realized that other people have something that he does not. So acts of knowing are formally distinguished according to the object that immediately confronts the knowing faculties.

Note well, though, that the 'object' is not the same as the 'thing'. One 'thing' can provide us with many different objects. The dog in front of me provides me with color when I look at him, with auditory vibrations when he barks, with a sensation of softness when I pet him, etc. One thing, many objects. Sometimes, though, we refer to both the thing and the object as 'objects', but we make a big distinction when we do this. The thing itself we call the 'material object' while the particular point of view we call the 'formal object'. So the material object might be the dog, but the formal object of sight is color and the formal object of hearing is sound; just as one material cause can receive several different formal causes, so one material object can present us with a number of different formal objects.

The intellect likewise is confronted with numerous types of objects which it pulls out, or abstracts, from the things we encounter. And just as sense knowledge differs according to a diversity in sensible objects which it encounters in the thing, so intellectual knowledge differs according to a diversity of intelligible objects which it abstracts from the thing. And as many specifically different objects of intellectual knowledge can be abstracted from the things we encounter, so many will be the objects that we can scientifically (that is, intellectually and rationally) investigate.

So how many scientifically intelligible objects can the intellect pull out? Well, first, you should notice that scientific knowledge must be certain and necessary knowledge; that is, scientific knowledge cannot be knowledge which might be false. Scientific knowledge must be true and certain. Otherwise, it's only opinion. 1+1=2. This is certain and necessary knowledge because it can't be in any other way; it isn't possible for 1+1 to equal anything else. But the things we encounter in reality don't provide us with that necessity. I can't say for certain that this dog will bark at the stroke of noon. This dog *might* bark at the stroke of noon. Then again it *might* be dead by 11:30. You see, the dog (and every other particular thing that we encounter with the senses) is always in motion, and a thing in motion is constantly changing; it is constantly other than it was. I don't just mean *local* motion—moving from place to place. But motion in a wide sense meaning any kind of change. Learning is a kind of motion, nourishing one's body is a kind of motion, receiving visual impressions on the eye is a kind of motion, etc. All the things of the sensible world are in a constant state of motion and, therefore, do not provide us with the necessity and certitude that science demands. So, if knowledge is to be scientific then the object of scientific inquiry must be abstracted from this state of constant change: it must be immobilized. And there are as many different kinds of scientific objects as there are ways of conceiving things by immobilizing them. This process of intellectually immobilizing them is called abstraction.

As we'll learn in this course, there are three ways that the thing can be immobilized; that is, there are three kinds, or degrees, of abstraction.

Natural Science

Notice that the things we sense in reality all have their own matter (i.e., material cause) with its own peculiar, individual characteristics; and because of this particular matter, the things in reality are constantly changing. That statue of Aristotle which is the subject of so much discussion has its own particular matter; namely, that singular chunk of clay that the sculptor used to make it. And that singular chunk of clay has its own characteristics. Maybe it's a little discolored, maybe the density isn't what it should be, etc. etc. This particular matter that goes to make up the singular thing we encounter in the real world is what we call individual sensible matter. It has unique qualities possessed by it and by no other. It is singular, one of a kind, and constantly changing.

But this individual is of no real interest to the scientist. Remember the scientist wants universal, necessary, and certain knowledge. He's not interested in saying 'this clay has such-and-such particular qualities at this particular moment', rather he wants to be able to say 'ALL clay has such-and-such properties at every moment, of this we are certain, and here's the reason why'. Hence, the scientist will intellectual leave behind the individual sensible matter and rise to what we call the first degree of abstraction. In this first kind of abstraction, the scientist leaves behind the individual sensible matter of the things we sense in reality but keeps what we call universal sensible matter. He leaves behind 'this chunk of clay' or 'that chunk of clay' and he keeps only

the universal notion of 'clay'. So, once again, the statue in reality has a *form* (e.g., of Aristotle) which is individualized by some particular sensible *matter* (e.g., this chunk of clay sitting in front of me). But the first level of abstraction will abstract from the *particular* or *singular* sensible matter and retain only the *common* or *universal* concept of that matter (e.g., clay in general). Suddenly the scientist is no longer considering this unique statue over here in the corner of the room (i.e., this form in this matter), but rather all statues universally (i.e., form in matter). All scientific investigation into physical reality must make this first kind of abstraction. No scientist stops at 'this flesh' or 'these bones' in particular, because he's wants to know about 'flesh' and 'bones' universally. He leaves aside all the unique characteristics about 'this flesh' and 'these bones' in order to get at what is always and everywhere true about 'flesh' and 'bones' in general.

This first level of abstraction gives us the Physical Sciences. Physical science, as we'll learn, has many, many subdivisions, and all modern scientific investigation will find a place somewhere in these subdivisions.

Now, the physical scientist abstracts from individual sensible matter but he necessarily retains the notions of universal sensible matter. If the scientist is studying the properties which always and everywhere pertain to apple pie, he must abstract from the various apple pies on the table and rise to a universal understanding of apple pie in general. Although this universal notion does not contain any real, singular apples in it (nor individual scoops of sugar and flour), nevertheless, it must still contain the concept of 'apple' considered generally (as well as the common concepts of 'sugar' and 'flour'). If it didn't, then the scientist wouldn't be thinking about an apple pie: an apple pie must be conceived as containing apples (and flour, sugar, etc.). That is, to consider the physical world, we must always conceive of it as containing sensible matter; otherwise we would not be thinking about the natural, physical world.

Mathematics

However, there is another level of abstraction which not only leaves behind the particular sensible matter ('this apple' and 'that bag of sugar'), but also gives up the common/universal sensible matter ('apple' and 'sugar'). This new level of abstraction rises above all sensible matter and considers purely intelligible matter, or rather 'quantity' itself, independently of any material cause. This is the level of Mathematics and the Mathematical Sciences.

The object of Mathematics requires no material cause in order for it to be conceived. While 'apple pie' must necessarily be conceived as having 'apples' as its material cause, 'triangle' does not need to be conceived as 'wooden' or 'plastic' or 'clay' or anything else. The number 2 doesn't need to be considered as 2 apple pies or 2 dogs; but simply as a quantity. The mathematician has abstracted from all sensible matter and has pulled out of physical things an object which is specifically different from the object of physical science. Now, it's quite true that in order for the mathematical object to exist independently of the mind, matter will be required; in order that 'triangle' exist outside our minds it must be 'a wooden triangle' or 'a plastic triangle' etc.—you'll never see 'triangle' floating down the street, but you might see a brass triangle lying in the road. But to be conceived, to be understood, we must leave beside all

considerations of sensible matter. Indeed, if we don't do this, we won't properly understand what a triangle is. A triangle existing in the wood (i.e., a wooden triangle) is not really a triangle. If you put it under a microscope, you'll see all kinds of ragged edges and imperfections. To understand the nature of 'triangle' as having three and only three sides, we necessarily have to abstract from all these physical imperfections. So while the physicist considers an object which requires both matter and form in order to be understood (e.g., the form of pie made up of apples, sugar, flour, etc.) as well as requiring matter and form in order for that object to exist, the mathematician considers form alone (e.g., the form of triangle); but a form which would need to have matter if ever it were to exist outside the mind. And both these intelligible *objects*—i.e., quantity, which is the object of Math, and sensible physical natures, which is the object of Physics—are abstracted from the same singular *things* existing in reality. That is, in Math and Physics, we have the same *thing* but looked at from two different points of view, just as sight and hearing both regard the same sensible *thing* but have two different *objects* or points of view. Or in other words, both Math and Physics have the same *material* object (e.g., apple pie), but they each have a different *formal* object (e.g., Physics considers the pie as being a real thing made up of real ingredients, while Math considers it as having height, width, volume, etc.)

Metaphysics

So, math considers beings which do not require matter in order to be conceived and understood but which *do* require matter in order to exist. Now, Physics is going to prove to us that there is another kind of reality; namely, immaterial reality. Once we prove that there *must* exist an immaterial Prime Mover, we will have learned that there are some things which not only *do not* require matter in order to be *conceived and understood* (such as mathematical objects), but which also *do not* require matter in order to exist: we will have discovered that there is a purely immaterial reality. Because of this, there is a level of abstraction which will leave behind not only singular sensible matter, and not only common sensible matter, and not only intelligible quantified matter, but *all reference to any matter whatsoever.* We will no longer be considering what is common to *physical or material being* nor will we be simply considering *immaterial being* but rather we'll be studying what is common to *all being* in general; or as it most often called, *being as being*. This is Metaphysics.

Now, properly speaking, acquiring the object of metaphysics is not really an abstraction, because we're not simply separating an intelligible object from the physical thing; we don't pull out of the physical thing a notion of 'being as being' in the same way we pull out the notes of 'colored' 'soft' and 'smelly'. Rather, it's a kind of separation because we are considering a wholly different sort of reality than the physical things we encounter with the senses. But this is way ahead of our brief introduction. For now just keep in mind that the object of Metaphysics is an object completely separated from reference to matter. Whereas Physics studies objects which require matter both in order to exist and in order to be understood (apple pie can neither be conceived nor can exist without 'apples'), and whereas Math studies objects which can be conceived without matter but cannot exist without matter ('triangle' which must be, for example, a 'wooden triangle' to exist), Metaphysics studies things which do not require matter either to be conceived or to exist (e.g., God, causality, relation, and in general being as being).

So the three most significant divisions of Philosophy based upon the objects which are studied is a division into 1) Physical Sciences, 2) Mathematical Sciences, 3) Metaphysical Sciences.

To sum up:

PHILOSOPHY
1. Speculative Philosophy
    a. Physical Sciences
    b. Mathematical Sciences
    c. Metaphysical Sciences
2. Practical Philosophy
    a. Art
    b. Prudence

In Relation to the Order of Learning

So we have seen how sciences are diversified according to three different kinds of abstraction that the mind can make from the particular things that we encounter in sensible reality. However, none of this means that, psychologically speaking, the sciences are best studied in this order; just because there are sciences of the First Degree of Abstraction, sciences of the Second Degree, and sciences of the Third Degree doesn't mean that we should study the Physical Sciences, then the Mathematical Sciences, and then the Metaphysical Sciences. Quite to the contrary, the learning process of the mind doesn't proceed according to abstractive levels, but rather from what is better known to us, more general, and more vague, to what is less known to us, more specific, and more clarified. For this reason, if a man were properly educated from his youth he would learn Math before he learns the Physical Sciences, because the concept of the arithmetical 'unit' comes before the concepts used in the Physical Sciences. He would learn Moral Science (which is a specific type of Physical Science) after he learned Psychology (which is another specific type of Physical Science) because how man should act is less clear than what man is. And he should learn Metaphysics only much, much later because it is the most difficult science and it pertains to things which are the least known to us; i.e., immaterial realities. But there is one exception to the rule which demands we go from the easiest sciences to the most difficult: Logic. Logic teaches the method of procedure in *all* sciences and must therefore precede all other studies. Yet, it is an exceedingly difficult undertaking because it is a science objectively located on the Third Level of Abstraction; Logic, as we'll learn, deals with an immaterial reality, namely the *relationships* between our various concepts.

So the proper order of study for a young mind should be the following: Logic, Mathematics, Natural Science (including Psychology), Ethics, and then finally Metaphysics.

COROLLARY: Two Divisions to be Avoided

The Wolffian Division

Christian Wolff (1679-1754) was a German rationalist philosopher of the so-called Enlightenment period who sought a new division of the sciences based upon a very corrupted

form of Scholasticism. According to Wolff, Metaphysics is not the last science to be studied. It was not for him the least known and most abstract of sciences. Rather, Metaphysics is the very first science known to man, and all other sciences are a contraction of Metaphysical notions. In other words, every speculative science is just an application of Metaphysics and Metaphysical notions (such as the principle of non-contradiction, Wolff thought) to some object that we encounter; and nearly all the facts of reality can be deduced from these fundamental concepts.

His division of speculative science is this:

METAPHYSICS

1. General Metaphysics (Ontology)
2. Special Metaphysics
    a. Metaphysics of Bodies
    b. Metaphysics of Spirits
        i. Of Created Spirits (e.g., the human soul)
        ii. Of Uncreated Spirits (i.e., God)

Wolff confused the logical and ontological order, and in doing so he inverted the natural progression of the human mind. Instead of beginning with sense knowledge and gradually building up scientific inquiries into reality, Wolff thought that we begin with an analysis of our fundamental notions and then deduce everything else that can be known about reality from these. But while it is true that primary principles such as non-contradiction are *defended* and *explained* by Metaphysics, we *use* these principles without giving them a second thought long before anyone ever questions them or brings them into doubt. So Metaphysics need not logically come first, even if ontologically speaking it treats of principles which apply to all reality, material or immaterial.

Unfortunately, the Wolffian division of the sciences became very popular in European universities. Many, many scholastic thinkers accepted this division without question and tried to present Thomism along its lines. For them, since Metaphysics treats of all beings in general, the other sciences must just be specific divisions of Metaphysics treating of specific kinds of being. However, as I've already mentioned, and as we'll spend much more time on later, Metaphysics deals with a completely different formal object than does Physics or Metaphysics. Metaphysics isn't related to the other sciences as whole to part (for example, as sense is related to sight, touch, taste, etc.) but as part to part (as sight is related to hearing).

The Wolffian division contributed to the problem I've mentioned a number of times; i.e., identifying Philosophy only with Metaphysics, and leading to its divorce from empirical, observable, measurable investigation. We'll be returning to this division much later on, but for now I warn you to be on your guard when reading certain Scholastic material (especially Jesuit books) written after the time of Wolff. This division is just one example of the many perversions of sound thought which have twisted the old doctrine. The human mind naturally and slowly proceeds from imperfect knowledge to perfect knowledge, from sense knowledge to intellectual

conception, from conception to the vast scientific synthesis. The Wolffian division would have us start with perfect knowledge and then work our way down to the things of sense!

The Existential Division

Much akin to the Wolffian division of the sciences (though not intentionally) is the modern existential approach to philosophy proposed by a large number of Thomists who follow the school of Etienne Gilson (1884-1978). Authoritarians claiming to have discovered new meanings in the texts of St. Thomas which somehow eluded each and every philosopher for nearly 800 years, the proponents of Existential Thomism (as it is often labeled) make the primary study of all philosophy a study of what they call 'esse'. Esse is a Latin word properly meaning existence or the act of existing. However, for the Existentialists, 'esse' is grasped intuitively and is a quasi-mystical concept. For many of them (following Gilson), modern science has made the traditional Scholastic sciences totally obsolete, and so Metaphysics is the only science for the Philosopher. Furthermore, all of his philosophic investigations are a gradual evolving of this primordial concept of 'esse' within which he will discover all things. So as Wolff thought we begin with a knowledge of all beings, so Existential Thomists think we begin with a knowledge of all beings as contained in the intuited concept of 'esse'. The truth is quite the opposite, we start with knowledge of material things (though under their most basic notions) and gradually build up to an analogical concept which will include both material and immaterial reality—we don't intuit it from the start; if we did, then we would have no real need to examine reality, but we would need only to examine our own consciousness. Metaphysics, then, is logically the only science for the Existential Thomist. Everything else is just a more specific clarification of our fundamental intuition. That is, there is no formal object in Metaphysics which is in any way different from the formal objects of Math and the Physical Sciences. Even if they refuse to admit it, Existential Thomists implicitly adhere to the Wolffian division and sever Philosophy from modern science.

The Properties of Philosophy

The properties of Philosophy are certain attributes or characteristics of Philosophy which follow from its nature. These are conclusions to what we've examined up until now.

To be the Most Universal Scientific Synthesis

This follows from the fact that Philosophy deals with all beings, whereas each individual science deals with one particular object. Of course, we have to remember that Philosophy deals with only those beings knowable by reason and is, therefore, specifically distinct from Sacred Theology.

To be a Perfect Scientific Synthesis

This follows from the fact that it gives true and certain knowledge of all of reality, whereas experiment and observation (with which most modern science is concerned) is only preparatory to a perfect knowledge of causes and gives us only probable conclusions. We'll discuss the defects of the modern experimental approach later on in the course.

To be a Perfective Synthesis for Man

This follows from the fact that Philosophy is divided into Speculative and Practical. As such man perfects not only his intellect with philosophic knowledge, but he uses this knowledge to create order in the acts of his will.

To be Necessary for Man

This follows from the previous property. Philosophy is necessary for man by teaching him the end of his rational human nature and how he is to pursue it. Furthermore, it teaches him the end of human society, both familial and civil, and the rights that must exist between men in order for the end of the family and state to be attained. Finally, it teaches him the natural obligations which exist insofar as he is a *created* being.

To be the Most Dignified Synthesis for Man

This follows from the fact this Philosophy treats of all beings, including the Divine. Any lower scientific synthesis treats only of created things.

To be Independent of Supernatural Theology

This follows from the fact that Philosophy proceeds under the light of unaided human reason. All sciences have principles, conclusions, and a connection between the two. In Philosophical Science, all of these are proven to the human mind on their own intrinsic merit independently of anyone asking that they be believed. On the other hand, the principles of Theological Science ultimately depend upon the fact that God has revealed them; that is, they cannot be proven unless we *choose* to accept what has been revealed by God.

To be a Necessary Tool of Supernatural Theology

Though neither Theology nor Philosophy is subordinated to the other, at the very least, Logic will be necessary for the development of Sacred Theology because it is the tool of all sciences. Logic, as we'll see, teaches the universal method by which reason is perfected, allowing man to proceed with ease, order, and without error in any process of reasoning. Theological reasoning is no exception. Furthermore, Theology often borrows principles which are learned from the Philosophical Sciences (e.g., the nature of man) in order to better explain its object. For this reason, Philosophy is often called the handmaid of Theology.

The Causes of Philosophy

Given everything that we've said about Philosophy up to this point, and recalling our discussion of the four causes, we can now lay out in general what the causes of philosophy are.

1. The Intrinsic Causes of Philosophy

    a. *The Material Cause*: The material cause, as we said, was that out of which a thing is made and remains in it. So what makes up Philosophy? What is the matter out of which the Philosophic Sciences are constructed? Subjectively speaking, it is the human intellect, because it is the intellect which is perfected by Philosophy. Objectively speaking, the matter of Philosophy is the object of philosophic inquiry: in general, all beings. The material cause of Philosophy is every being about which we can have human knowledge. Specifically, the matter is physical beings, mathematical beings, and metaphysical beings.

    b. *The Formal Cause*: And what is added to all beings to transform them from what they are into a synthesized and intelligible whole? Human Reason. So when human reason is applied to an understanding of all beings in their entirety we get Philosophy; just as when the form of Aristotle is applied to the clay, we get a statue.

2. The Extrinsic Causes of Philosophy

    a. *The Efficient Cause*: And what is the cause which unites the form and matter; the cause which applies human reason to examining all beings? The human intellect which perceives itself to be in ignorance of a complete and comprehensive grasp of reality. It naturally flees this ignorance and begins to put things together. So the necessary efficient cause of Philosophy is the human intellect, because it is the intellect which investigates reality rational; that is, which applies reason to the understanding of all beings. And the occasion or situation which prompts the intellect to do this is what we call the occasional efficient cause. And there are two types: the fundamental occasional efficient cause is the state of ignorance in which the intellect finds itself—the proximate occasional efficient cause is *wonder* or the puzzlement of the intellect when it realizes it is in a state of ignorance.

    b. *The Final Cause*: And what is the goal in creating Philosophy? Why does the intellect seek to perfect itself? Well, immediately, the goal of the intellect is to rid itself of its ignorance. So we say that proximate final cause is knowledge, or rather perfection of the intellect. And since this knowledge can be used to direct the acts of the will, moral activity (i.e., the perfection of the will) is another final cause. So the proximate final cause of speculative philosophy is the perfection of the intellect, while the proximate final cause of practical philosophy is the perfection of the will. But the intellect and will are only parts of man, and, properly speaking, it isn't the intellect or will which is acting, but rather it is man who is acting *by the use* of his intellect and will. And since the part is always for

> the sake of the whole, the remote final cause of Philosophy isn't merely the good of the intellect or the will, but the good of man as a whole.

So to summarize all that we have said about the nature of Philosophy, the human intellect in a state of ignorance applies its power of reasoning to all knowable beings, creating sciences and synthesizing them into a comprehensive view of reality, for its own perfection and ultimately for the perfection of man as a whole. Every science finds its place in Philosophy, as every part finds its place in the whole.

FORMAL LOGIC

Introduction

The Definition of Logic

REASONING AND THE SYLLOGISM—What is logic and so what? Is it emotionless criticism worthy of the Vulcan name? If so, it would seem that the logician is almost *inhuman;* at least, that's the message that Spock seems to give. The logical person, he seems to say, denies all those areas which distinguish man from other animals and it turns him into a cold, analytical computer. Quite to the contrary, as we'll see in this course, Logic perfects man in that precise area which makes him to be specifically human: namely, reason. And the emotions aren't denied or destroyed by Logic, but rather, a logical and prudent man will use what Logic teaches to properly discipline the emotions—in this way, anger, love, desire etc. will not be buried deep in the human personality, but instead they will only appear at the right time and in response to the right objects. Logic will actually make man *more* human by perfecting his reason and making it act as it should, just like the medical doctor will perfect the human body and make it perform and function as it should.

But what is reason? And how is it perfected? Perhaps its easiest to explain what reason is by first giving some examples. I have a son, Liam. He's three months old. And one of the things that my wife has impressed upon me is that I need to constantly check his diaper. If it feels wet, then I need to change him. So, about every hour I examine his diaper. And I'll say something to myself along these lines:

His diaper is wet.
Therefore, I need to change it.

In saying this, I've actually gone through an informal process of reasoning. By saying 'therefore' I'm indicating that the second statement follows from the first as a consequence. But there's a third element implicitly contained in my hourly process of reasoning: namely, the command of my wife—if Liam's diaper is wet, then I need to change him. If we were actually to state this command as it implicitly appears in the reasoning, we would get the following:

If Liam's diaper is wet, then I need to change him.
But Liam's diaper is indeed wet.
Therefore, I need to change him.

This fully stated process of reasoning is called a *syllogism*. It's a movement of the intellect from two truths that we know (e.g., my wife's command, and the fact that Liam's diaper is wet) to a third truth that we previously did not know: namely, the conclusion that I need to change Liam now. Before I joined my wife's command with the fact that Liam's diaper is wet, I didn't know for sure whether or not I needed to change him. But by knowing that a wet diaper means 'change him', and by knowing that, in fact, his diaper is wet, the conclusion is *caused* in my mind by certain logical laws. It's these logical laws connecting the statements and the conclusion that we'll be studying in this course.

We go through reasoning processes like this all the time. Whenever we intellectually analyze something, or make decisions about what to do, we use reasoning processes similar to the one above. If we walk outside and see that the ground is wet, we might reason to the conclusion that it rained. We might say:

The ground has become wet.
But a wet ground might be caused by rain.
Therefore, it might have rained.

And to strengthen the likelihood that rain was the cause, we might add other processes of reasoning:

A wet ground is caused by rain if I observe nothing else that could have moistened it.
But I don't observe anything else that could have moistened it (e.g., no sprinklers, no broken water main, etc.).
Therefore the wet ground is caused by rain.

Even when we try to decide where to go out to dinner, we use processes of reasoning. 'Should we go to the steakhouse for dinner?' 'No, I don't like their food'. That is:

We shouldn't dine at a place which gives me displeasure.
But the steakhouse is a place which gives me displeasure.
Therefore, we shouldn't dine at the steakhouse.

And a plethora of examples can be found in political debate:

What leads to a shortage of needed doctors is bad for health care.
But nationalization of health care coverage leads to a shortage of needed doctors.
Therefore nationalization of health care coverage is bad for health care.

Of course, we very rarely state the syllogism in this long, explicit form. We usually just resort to an abbreviated form of the syllogism (e.g., 'Why shouldn't we nationalize coverage? Because it leads to a shortage of doctors.'). And though this might make conversation a lot easier (and a lot more colorful!), it also leads to a lot of mistakes. Often times, what we mean in that abbreviated syllogism contains logical errors of which we aren't aware. Hence, Logic will help us to avoid error by 'blowing up' and exposing the syllogisms that we employ to examine them closely. You'll be surprised just how many arguments used in the political arena are totally fallacious! Then again, maybe you won't be... The point is that all human discourse employs this syllogistic reasoning. Literature, poetry, and scientific inquiry cannot escape from the fact that the mind, in coming to new knowledge, always works in syllogism. And in this course we will take examples from each to 'blow up' the syllogisms and analyze them. This 'blowing up' is what we call putting arguments into *strictly syllogistic form*.

Let's take a passage from St. Thomas to see the process of reasoning contained within it:

"It is natural for man, more than for any other animal, to be a social and political animal. For all other animals, nature has prepared food, hair as a covering, teeth, horns, claws as means of defense or at least speed in flight, while man alone was made without any natural provisions for these things. Instead of all these, man was endowed with reason, by the use of which he could procure all these things for himself by the work of his hands. Now, one man alone is not able to procure them all for himself, for one man could not sufficiently provide for life, unassisted. It is therefore natural that man should live in the society of many."[7]

The argument contained in this passage might be 'blown up' as follows.

A creature which cannot procure all the natural provisions for life without assistance of others, is a creature which is naturally ordered to live in society.
But man is a creature which cannot procure all the natural provisions for life without assistance of others.
Therefore, man is a creature which is naturally ordered to live in society.

Putting the argument in this very clear form we see that the inability to procure all of life's necessities is being used to compare two things: namely, man and the natural ordering to live in society. In this example, Thomas is arguing syllogistically that providing for all of life's necessities is the final cause or reason why man is naturally ordered to live in society.

---

[7] De Regno, L. I, c. 1, n. 5

The arguments of St. Thomas are some of the clearest ever written. Pick out a few other passages in Thomas's writings and see if you can put them in this strictly syllogistic form.

LOGICAL RELATIONS or SECOND INTENTIONS—THE OBJECT OF LOGIC—When a thing exists outside of the mind, it has certain physical properties and characteristics. A baseball, for example, has a certain weight, diameter, hardness, temperature, etc. But when it is conceived, it takes on certain logical characteristics which belong to it precisely in this mental existence. For example, the baseball becomes a 'noun', and in the statement, 'a baseball was pitched' it becomes a 'subject' while 'pitched' is the predicate. So everything has a twofold set of properties: one set as it exists outside the mind, and another which are added to it only when it is conceived by the intellect.

Take the following example of reasoning:

If Joe is a pitcher, then he is baseball player.
But Joe is a pitcher.
Therefore, he is a baseball player.

Joe and the game of baseball are real things that exist independently of the mind. You can see Joe, you can go to a baseball game, you can throw out a pitch, etc. But there is something in the syllogistic argument that can't be touched, or watched, or tasted, or in any way sensibly experienced. There is something in the argument that exists in the mind along and is known only by the intellect. Namely, the relationship between *if* and *then.* The if-then statement is nothing real; it doesn't exist outside the mind and you'll never encounter it walking down the street. Joe is a physical reality and exerts a real cause on the motion of the baseball he is throwing. This force which he exerts as a pitcher can be studied, measured, and varied. The physics of throwing out a baseball has its own properties and determinable laws. But the physicist will never bottle up the 'if-then' relationship and put it under a microscope. Nevertheless, it has its own laws which can be known and studied. The 'if-then' relationship with all its knowable properties and laws is just one example of a *logical relationship*. While the physicist might be interested in the density of the ball, the speed of the pitch, and the relationship between the two, Logic is interested in things like the relationship between 'if' and 'then'. Imagine if we were to say:

If Joe is a pitcher, then he is baseball player.
But Joe is a baseball player.
Therefore, he is a picher.

As we will learn later, this violates a special law of reasoning. Just because Joe is a baseball player it doesn't follow that he is a pitcher. He might be a right fielder, for instance. If the argument were true, then everyone playing baseball would be a pitcher. So we have two kinds of orders that can be examined here. We have the real physical order with which the physicist deals when examining the velocity of the ball, or the ability of Joe to toss out a pitch; and we have the logical order which considers Joe, not as a physical being, but as a part of the if-then relationship. Studying this non-physical way of existence is what concerns the science of Logic.[8] And as we'll learn there are determinate rules which govern these logical relationship; not only the 'if-then' relationship, but the subject-predicate relationship, the principle-conclusion relationship, and many, many others.

Let's take a few more examples.

Every corporeal (i.e., bodily) being is corruptible (i.e., can be broken apart).
But every man is a corporeal being.
Therefore, man is corruptible.

---

[8] In I Post. Anal, lect. 2.

Man and bodily beings are real things that exist outside the mind. But in this syllogism bodily being is related in a special, logical way to man and corruptibility. As we'll learn later, this special way of being related is called the 'middle term'. Corporeal being, in the syllogism, is related as the middle term which joins man and corruptibility. And because the relationship of corporeal being to the other terms is employed validly here (i.e., it doesn't violate any logical rules), the conclusion follows from the premises. Because the logician knows what a middle term is, and because he knows the rules for uniting two terms by means of a middle term, he can look at this syllogism and pronounce that the reasoning is good. But what happens if we are to switch a few things around? What if we said:

Every corporeal being is corruptible.
But every man is a corruptible.
Therefore, every man is a corporeal being.

Well, the conclusion is perfectly true, but this is not a good process of reasoning. One of the rules of logical relationships is being violated here. As we'll learn a little later, 'corruptible' is being used as a middle term uniting man and corporeal being, but it's not supposed to be doing this. Let's use a more obvious example to illustrate the point:

Every plant is corruptible.
But every man is corruptible.
Therefore, every man is a plant.

The process of reasoning used here is exactly the same as the previous example, but we can clearly see that an error has been made. It's not necessary that you know right now exactly what that error is, but you need to understand the importance of examining the logical relationships that exist between our various concepts. An improper change of relationships will lead to a very troublesome reasoning process. These relationships are the object of the Science of Logic.

The rules governing logical relationships are not always easy to see. As with the laws governing physical reality, it often takes much laborious inquiry and a long time at study in order to determine them with precision. Only a person who makes the effort to know and understand these rules will be able to reason well; and he who devotes the time necessary to mastering these rules will not only be able to reason well, but he will be able to defend everything that he says, and he will be able to destroy the erroneous arguments of others.

THE SCIENCE AND ART OF LOGIC—Now, when it comes to judging that rain causes the ground to be wet, as we used in an earlier example, most people have no problem with this reasoning process. It's quite easy to see that no other explanation will adequately account for the outdoors being so hazy and wet. Even people who have never taken a course in Logic can make such simple syllogistic processes. In fact, some of the greatest scientists have never been formally schooled in Logic. Yet, they are generally competent in making rather complex rational arguments. This is because everyone has the natural ability to reason. Since we first formed propositions as children we have been actively reasoning about the world. This innate, native ability to move from previous knowledge to new knowledge by means of syllogizing is as natural a function of the mind as growing and nourishing is to the body. But there is still a big difference between the two.

The growing body is naturally ordered to grow in a certain way; it is determinate in its processes and these natural inclinations cannot be changed. The body will always to tend to grow in one way, and any variation will mutilate the body. But the intellect is not so determined. In fact, in judging about things—that is, in saying that such-and-such is true or such-and-such is false—the intellect is not at all determined by nature. It may judge something to be true which really is true, but then again, it might judge something to be true when in fact it's false. Though the intellect naturally judges and naturally reasons, it doesn't always reason correctly about this or that particular material. In a similar fashion, our fingers naturally move, but they don't naturally move in a manner required for, say, playing the piano. If they

did, then everyone would naturally be a pianist. But we aren't all pianists. To become a pianists we have to learn specific rules for moving our fingers in such-or-such a pattern in order to strike the keys in the right way. The movement of the fingers is indeterminate to playing any instrument (be it piano, or trumpet, or violin), and we require—in addition to our natural ability to move them—the art of piano playing by which our fingers are determined to move in a way suited to playing the piano.[9] So by examining the motions of the fingers we develop certain rules by which the fingers are best disposed to playing the piano; we might call this 'piano theory' or the 'science of piano playing'. And by consistently moving our fingers according to the rules laid down in the 'science of piano playing' we will gradually develop the habit or 'art of piano playing'. Only then will we be pianists.

The intellect works in the same way. Though we all have the natural ability to reason (just as the natural ability to move our fingers), we don't always employ this properly to get the desired effect; namley, true and certain knowledge. Occasionally, by the natural ability to reason alone we get lucky and reach true and valid conclusions—just as occasionally the new piano student can play a passage perfectly—but we only possess the art of reasoning when we can do it consistently and without much effort—just as the student only becomes a pianist once he can consistently and easily play the same passage without making any mistakes. So in addition to our natural ability to reason, we will require a habit of consistently reasoning well and without error. This is what we call the art of Logic. And just as the rules for playing the piano have to be laid down first before we can knowingly practice piano playing in agreement with those rules (i.e., the 'science' of piano playing must precede the 'art'), so the 'science of reasoning well' must precede the 'art of reasoning well'. In other words, we only get the art of reasoning well when we know the rules laid down by the science of reasoning well and we make a concerted effort to reason according to those rules until we have developed the habit of good reasoning. The term 'logic' then refers to the Science of Logic which studies the logical relationships present in the syllogism and lays down rules for reasoning well; but it also refers to the Art of Logic which is the habit of reasoning well that we acquire but constantly reasoning accordance with the laws laid down by the Science of Logic. Our course is in the Science of Logic. We will examine the various logical relationships that exist in the syllogism and we will lay down the laws for proper reasoning. But we learn the Science of Logic in the hopes that you will practice thinking in accordance with the laws until you develop the habit of thinking clearly, orderly, and error-free: we study the Science in hopes that you will acquire the Art.

From all that we've said, it's easy to see why Logic has come to be nominally defined as 'Rational Science' or 'the science and art that directs the acts of reason'. It's not only concerned with studying the acts of reason or determining what these acts are—such is really the domain of psychology—but it's interested in determining how these acts of reason *ought* to be ordered so that reasoning is right and true. Logic is called rational science not only because it is reasoned knowledge (*all* science is reasoned knowledge) but because its final cause is to determine how best to exercise and coordinate our mental operations for the sake of acquiring truth while exploring the various areas of the knowable universe. Hence, according to its etymology, Logic is nominally defined as the art or science of reason.

St. Thomas puts all this very succinctly:

> In the beginning of his Metaphysics, Aristotle state that the human race lives by art and reasoning. He seems to touch here on something properly human, which distinguished man from the other animals. For while the brute animals are moved to their actions by natural instinct, we direct our actions by rational judgments. To enable us to carry out these actions easily and in an orderly way, we have invented many arts. For an art is nothing other than a certain ordering of reason by which human acts achieve a suitable end through determinate means.
>
> Now reason is able to direct not only the acts of inferior faculties, but also its own acts. For the capacity to reflect upon itself is proper to the intellectual power; the intellect understands itself and, similarly, reason can reason about itself. Now, if by reasoning about the acts of the hand, we discovered the art of building, and this art enables us to

[9] I-II, q. 57, a. 3

build easily and in an orderly way, then, for the same reason, we need an art to direct the acts of reason, so that in these acts also we may proceed in an orderly way, easily, and without error. This art is logic, the science of reason.

Logic concerns reason not only in the sense that it is according to reason (this is common to all the arts), but also in the sense that it is about the acts of reason itself as its proper matter. Therefore, it seems to be the art of arts, inasmuch as it directs the acts of reason, from which all the arts proceed.[10]

So to give the real definition of the **Science of Logic** we would say that it is *the rational investigation of logical properties determining the rules by which the operations of the intellect are directed to attaining truth.* And the real definition of the **Art of Logic** would be *the habit by which man may proceed with ease, order, and without error in the very acts of reason themselves.*

The Divisions of Logic

So we've seen that Logic is divided into the Art of Logic and the Science of Logic. How else is it to be divided?

Logic is a kind of mental construction; it builds up in our intellects a complex construct of various relationship; it builds arguments and sciences. Now, in any kind of construction we have to consider two things: namely, the material or matter out of which the construct is built, and the form which is given to that matter. So in building a house, we have to consider what will be used to build the house (e.g., stone or wood or brick, etc.) and we have to consider how that material is going to be arranged (e.g., four walls, a proper foundation, a roof which will protect from the elements, etc.). Knowledge of both the matter and form will be required to properly construct a house. Even if an architect has an exact knowledge of blueprints and knows precisely how to arrange all the parts to create a perfect home, nevertheless the house isn't going to stand if he picks an inferior material. On the other hand, even if he knows the strongest and best materials to use in building a house, even if he knows the absolute best material for constructing a roof, this won't matter at all if he doesn't have any knowledge of the blueprints. Hence, both matter and form are necessary in the construction of something.

Logical constructions are no different. The matter of the syllogism, and hence the matter of reasoning, is the concepts and propositions that go to making up the argument; while the form of the syllogism is the particular disposition of those concepts and propositions within the syllogism itself. So in the syllogism:

Every animal has senses.
But man is an animal.
Therefore man has senses.

'Animal', 'having senses', and 'man' are the matter, but also the propositions 'every animal has senses' and 'man is an animal' are the matter. The form, however, has to do with the arrangement of this matter within the syllogism. The form in this example might be expressed as follows:

Every A is B
But C is A
Therefore, C is B.

If we want to have a good and proper syllogism we need to know not only how the concepts and propositions should be arranged (i.e., the form of reasoning), but we also need to know what types of concepts and propositions these should be (i.e., the matter of reasoning). Take the following example:

Every bird can fly.

---

[10] In I Post. Anal., prooem.

But pigs are birds.
Therefore, pigs can fly.

Notice that this follows the *exact same form* of the previous argument (Every A is B, but C is A, therefore, C is B); from the point of view of this form we have a perfectly valid reasoning process. No one can deny that if A is B and C is A then C will be B. Yet the conclusion isn't true. Pigs don't fly. For true reasoning it isn't enough that the form be *valid* but the material which is plugged in for A and B and C must be the right kind of material. Take the following examples:

Every man is an animal.
But all animals require nourishment.
Therefore man requires nourishment.

All soccer balls are donkeys.
But all men are soccer balls.
Therefore, all men are donkeys.

Both examples follow the exact same form of reasoning—all A is B, but all B is C, therefore all A is C—and consequently they are both *valid* processes of syllogizing. But there is a big difference between the two. In the first example, every statement is true and as a consequence the conclusion is true. But in the second example, *none* of the statements is true; the matter is not what it should be. So there is a big difference between the form of reasoning and the matter of reasoning. When the form is as it should be a syllogism is said to be *valid*. When the matter as well as the form is as it should be the syllogism is said to be *true.*

Let's take three more examples:

1) Every animal has senses.
But man is an animal.
Therefore man has senses.

2) Every animal is rational.
But a dog is an animal.
Therefore, a dog is rational.

3) Every animal is living.
But every living thing has senses.
Therefore, everything with senses is living.

In the first example, all the statements are true and the reasoning process is valid. It's a good syllogism in regard to both matter and form. In the second example, the reasoning process follows the same form as the one before it, but one of the statements is false; i.e., it fails to be a good syllogism because of its matter. Hence, it is valid but not true. In the third example, we have defects in both matter and form: it's not valid to argue Every A is B, but every B is C, therefore, every C is B. And it's not true that every living thing has senses (some living things are plants).

So the science of Logic studies both the form and matter of reasoning. *Formal Logic* is that part of Logic which studies what must be the disposition or arrangement of concepts and propositions so that reasoning be correct and valid. *Material Logic* is that part of Logic which teaches what the content and mode of expression of concepts and propositions must be in order that the conclusion of reasoning be true and

certain. This semester we will be studying Formal Logic, next semester we will be studying Material Logic.

Formal Logic

Now, Formal Logic is subdivided according to what we will call the three operations of the intellect. So far we have seen a good number of examples of the syllogism or reasoning. This is the process by which the mind gradually progresses from old knowledge to new knowledge which was potentially contained in the old[11]:

Every man is an animal.
But all animals require nourishment.
Therefore man requires nourishment.

But before it can undertake this rational process of combining judgments together, the mind must first *make* those judgments; that is, it must judge that 'every man is an animal, ' and it must judge that 'every animal requires nourishment.' But that's not all. Before it can judge that 'every man is an animal' and 'every animal requires nourishment', the intellect must know what man, animal, and nourishment are. It must apprehend the concepts of 'man', 'animal', and 'nourishment.' So in order to reason, the intellect must first judge, and in order to judge the intellect must first apprehend. So we have three operations of the intellect, one ordered to the next.[12] And these are:

Simple Apprehension
Judgment
Reasoning

Simple apprehension is the intellectual act whereby you conceive of something without affirming or denying anything about it. So I think 'animal' without asserting or denying anything about the nature of animal. I don't think 'animals are living' or 'animals are not plants'. I simply apprehend a nature or essence or, what we will call, a 'quiddity'. Quiddity means the essence of a thing. It's derived from the Latin question 'quid est?' or 'what is it?' A quiddity is anything which can be conceived by the intellect and manifests what a thing is. Thus, man, whiteness, learned, animal, nourishment, etc. are all quiddities. In simple apprehension I conceive of a quiddity, even if only vaguely and obscurely, without affirming or denying anything about it.

Judgment is the act of the intellect whereby is composes or divides concepts by affirming or denying them of each other.[13] Hence, 'animals require nourishment' composes or joins together the simply apprehended concepts of 'animal' and 'nourishment' by affirming (or 'predicating', as we will call it) nourishment of animal. Again, 'no animal is a plant' divides or separates the concepts of 'animal' and 'plant' by denying or negating plant of animal. When I say 'man is an animal' my intellect is assenting or approving or 'seeing' the composition of the predicate 'animal' with the subject 'man' in the same subject; that is, the intellect is apprehending not just the concepts but its understanding that the thing represented by the subject (i.e., man) and the thing represented by the predicate (i.e., animal) are found together in reality outside the mind identified in the thing being observed and considered (i.e., the man being studied). Whereas there is no logical truth in simple apprehension (e.g., the concept 'nourishment' is neither true or false), there is indeed truth and falsity in the judgment (e.g., it is false to deny nourishment

---

[11] I, q. 79, a. 8.; De Veritate, q. 15, a. 1

[12] In I Post. Anal., lect. 1, n. 4; In I Periherm. (De Interp.), lect. 1, n. 1-2; In III De Anima, lect. XI; I, q. 85, a. 5.

[13] De Veritate, q. 14, a. 1

of animal, and it is true to deny plant of animal). When we compose what is separated in reality or separate what is composed in reality, we have falsehood.

Simple apprehension and judgment are the elements of reasoning. And everything composed of elements depends on the integrity of those elements for its own integrity; as they say a chain is only as strong as its weakest link. So in order to properly build up the syllogism we must deal with each operation in turn. That is, if Logic wishes to perfect the intellect's ability to reason, it must also perfect (insofar as it can) the intellect's ability to apprehend and to judge. For this reason, Formal Logic is divided into the Logic of the First Operation (i.e., simple apprehension), the Logic of the Second Operation (i.e., judgment), and the Logic of the Third Operation (i.e., reasoning).

Material Logic

Material Logic is also subdivided. The goal of logical training is to lead the mind to perfect knowledge; knowledge which is not only true, but certain as well. That is, knowledge which cannot possibly be false. When we have a syllogism that leads to knowledge that cannot possibly be in any other way then we have demonstrative knowledge. In demonstrative knowledge, the intellect has no choice but to assent to the conclusions; it sees why the conclusion necessarily follows from the premises and it sees why the opposite cannot possibly be true.

So: a plane figure with three sides necessarily has three interior angles equal to 180 degrees.
But an isosceles triangle is a plane figure with three sides.
Therefore, an isosceles triangle necessarily has three interior angles equal to 180 degrees.

This syllogism is absolutely certain; the premises are certain because this is definition of a triangle and the conclusion is certain because it validly follows from the certain premises. The conclusion is demonstrated.

But sometimes, the intellect is not so compelled by the evidence given to it that it necessarily assents to the conclusion. Sometimes the propositions or judgments that make up the syllogism are not unquestionably certain and true, but they are only *probable.* To be probable means to be 'open to debate'. A probable premise is one which might be true but nevertheless doesn't exclude the possibility that it is false. So when we say,

All mothers love their children.
But Jane is a mother.
Therefore, Jane loves her children.

The first proposition, namely, that all mothers love their children, is not necessarily true. Though nature gives each mother a natural inclination to care for their children, we know from sad experience that some mothers violate this natural tendency and despise their children. So the conclusion that Jane will love her children just because she is a mother follows only with a certain amount of probability, but it's open to debate. Syllogisms that don't remove all demonstrate something, that is, syllogisms that lead to a conclusion which may be true but may be false pertain to what we call Dialectic. Dialectic is the part of Logic which establishes a method of arguing from probable principles. Most modern science makes use of dialectic. When the botanist notes that plant A exerts a certain gas, and plant B exerts the same gas, and plant C as well, and then notices the same gas being given off by plants D, E, F, and so on, he might conclude that *all* plants give off this gas. But his conclusion is only probable. Why? Look at his argument:

What is true of plants A-Z is true of all plants.
But giving off this gas is true of plants A-Z.
Therefore, giving off this gas is true of all plants.

His first proposition is only probably true. Perhaps plant YYY doesn't give off this gas, but the botanists stopped just before examining plant YYY. As it stands, his conclusion is only probable; that is, it might be false. He will require more evidence to demonstrate his conclusion. It must be proven, which is why a probable proposition might also be called *provable* ('probable' comes from the Latin 'probare' meaning 'to prove').

Now, Demonstrative Logic and Dialectical Logic appeal directly and exclusively to the intellect. In demonstration the intellect is compelled to assent to the conclusion because it sees that something is true and it sees that the opposite must be false; in dialectic the intellect sees that the conclusion is *possible* but makes no irreversible commitment to the truth or falsity of the conclusion. However, there is a lower level beneath dialectical argumentation which appeals not only to the intellect, but to the will as well. And we call this Rhetoric.

In Rhetorical argument, the intellect is not compelled by the evidence to believe one side or another just as in dialectic, but the arguer intends to *persuade the will* (not the intellect) to *choose* one side over another; to accept a conclusion not because the intellect sees evidence to support that conclusion, but because it is proposed to the will as something which is *good* to believe. In other words, the rhetorician doesn't want to prove anything to you. Rather, he wants you to believe that it is a *good* thing to accept his position and a *bad* thing not to accept it. He is not concerned with truth, but with desire. Rhetoric makes up the bulk of modern political debate. Rarely will you here a politician or political commentator appeal to the intellect through cogent, reasoned arguments defending and proving his position. Instead, he will try to persuade you that undesirable things will follow if you don't believe him and accept his position.

Now, even lower than Rhetoric we have the domain of Poetics (sometimes called 'Literary Argument). Poetics is the lowest form of reasoning. It makes almost no appeal to the intellect; its syllogisms are fraught with abuse and equivocation or, sometimes, missing entirely. Poetics is an attempt to persuade you to accept a position because of a pleasing or displeasing representation. Describing an event with harsh and unpleasant words is a poetic tool; by using words that upset us, it is hoped that you will reject what is taking place at that event. Speaking of a political proposal with words that make us feel good is the same kind of argument. It is hoped that we will accept it because of the way it makes us feel. Poetical argumentation, then, makes no appeal to the intellect or to logical proof. It is aimed at the emotions; it is an attempt to manipulate the passions in the hope that we will follow *them* instead of reason. Hollywood documentaries are a prime example of poetics. We accept the charge to combat global warming because we feel sorry for all the images of polar bears stranded on melting ice. Never mind the scientific evidence in favor or against man-made global warming, and never mind the rational examination of our obligations to animals; no, we accept global warming and our duty to end it merely because the images make us feel guilty. Poetical argumentation, for all its beauty and use, becomes an insult to man's rational nature when it forces him to act contrary to the dictates and commands of reason. And spotting poetical argumentation can be very simple: it usually involves the word 'feel' (as in 'don't you feel...' or 'I just feel that...').

Now, sometimes reason fails completely in making an argument because of some defect or substantial error in its reasoning. This is called Sophistry. We won't study this in Material Logic. Instead, we study it at the end of Formal Logic because all sophisms, as we will see, are defects in the *form* of reasoning, not in the *matter* of reasoning.

So depending on the matter which is used, reasoning can either be Demonstrative, Dialectical, Rhetorical, or Poetical. Hence, Material Logic is divided into those four branches. In the second semester of our course, however, we will only study Demonstration and Dialectic. The reason is because Rhetoric and Poetics require a knowledge of the passions and the will, and these aren't studied until you reach Psychology. Demonstration and Dialectic, on the other hand, make no appeal to the passions or will, but only to the intellect.

St. Thomas summarizes what we have seen while commenting on Aristotle:

The parts of Logic must therefore correspond to the different acts of reason, of which there are three. The first two belong to reason insofar as it is a kind of intellect [i.e., insofar as it simply *understands* without moving itself through a syllogistic process]. The first of these is the understanding of indivisible or simple things [i.e., the simple apprehension of a quiddity], the act by which we conceive what a thing is (some call this act 'intellectual representation' or 'intellectual imagination.') Aristotle's teaching in the *Categories* is ordered to this act of reason. The second act of the intellect is the composition or division of things that are understood, the act in which truth or falsity is found [i.e., judgment]. Aristotle considers what pertains to this act in his *On Interpretation*. The third act is proper to reason itself; it is the act by which we proceed from one thing to another, so as to arrive at a knowledge of the unknown from the known. The remaining logical treatises [of Aristotle] pertain to the third act of reason.

In certain respects, the acts of reason are similar to natural acts (hence, art imitates nature as much as possible). Now, natural acts differ in three ways. In some of them, nature acts with necessity so that it cannot fail. In others, it usually achieves its proper act, although it sometimes fails. Here there are two possible acts. One takes place for the most part, e.g., when a physically complete animal is generated from the germ cells. The other takes place when nature fails to achieve the appropriate result, e.g., when an abnormal animal is born, because of a defect in the generative process.

This threefold difference is also found in the acts of reason. One process of reasoning leads to a necessary result where truth cannot fail [i.e., Demonstration]. Through this process we acquire the certitude of science [by which Thomas means true and certain knowledge demonstrated by the syllogism]. Another process attains truth for the most part but not with necessity [i.e., Dialectic, Rhetoric, and Poetics]. A third process fails to attain truth because of a defect in some principle which should have been observed in the reasoning process [Sophistry].

The part of Logic concerned with the first process of reasoning is called the 'judging' part, because judgment achieves the certitude of science. Now, we cannot judge about effects with certitude unless we resolve them into their first principles [i.e., all demonstrative syllogisms must ultimately rest on self-evident judgments which cannot be doubted, as we'll learn later]. Therefore, the judging part of Logic is called 'analytics,' i.e., the analyzing or resolving part [i.e., tracing the processes of reasoning back to the self-evident judgments on which they are based]. The certitude of judgment achieved through analysis is based either on the form of the syllogism alone or, together with the form, on the matter of the syllogism, i.e., on propositions which are *per se* and necessary [we'll learn about these later]. The analysis based on the form [i.e., Formal Logic] is treated in the Prior Analytics, which considers the syllogism in itself, and the analysis based on matter [i.e., Material Logic] is treated in the Posterior Analytics, which considers the demonstrative syllogism.

The part of Logic which pertains to the second process of reasoning is called the 'inquiring' part. Inquiry does not always arrive at certitude; hence, what is discovered by inquiry must be submitted to judgment before certitude is possible. Just as among the natural processes which occur for the most part, there are various degrees (for the stronger a natural power is, the rarer its failure to achieve its proper effect), so, among the rational processes which lack certitude, there are various degrees, depending on how closely each on approaches to perfect certitude.

One such process, while falling short of science, *does* achieve belief or opinion because of the probability of the propositions from which it argues. Reason fully embraces one part of a contradiction, though not without some fear that the other part may be true. The part of Logic which is called 'topics' or 'dialectics' is ordered to this rational process, since the dialectical syllogism proceeds from probable premises. Aristotle treats of it in his Topics.

There is another process which does not fully achieve belief or opinion, but only a kind of suspicion. Reason does not fully embrace one part of a contradiction, although it does tend more towards one part than the other. The art of Rhetoric is concerned with what pertains to this rational process.

Sometimes we are moved towards one part of a contradiction by nothing more than a kind of regard or esteem resulting from the way something is represented. This is analogous to the way in which a particular food appears disgusting when it is represented in the image of something disgusting. The art of Poetry is ordered to this. For the poet's vocation is to guide us towards what is virtuous by representing it as attractive.

All of these pertain to the part of philosophy which concerns reason, since it is by reason that we are led from one thing to another.

The part of logic concerned with the third rational process is called 'sophistics' and is treated by Aristotle in his On Sophistical Refutations.[14]

EXERCISES: Before we start learning the rules of reasoning, let's test your Natural Logic and see just how well developed it is. In the following arguments, pick out the conclusions which validly follow from their premises and those which do not follow. For the latter, give the reason why they do not follow from their premises.

1. Since Americanism is opposed to Socialism and Socialism is opposed to Fascism, if follows that Americanism is opposed to Fascism.

2. Every vegetative being is living; but every sentient being is living; therefore, every vegetative and every sentient being are living.

3. Since no triangle has five sides, neither can any square have five sides, for no square is a triangle.

4. No ape is rational, because some animal is rational, and no ape is an animal.

5. What's immaterial is inconsequential; thus thought is inconsequential, since thought is immaterial.

6. Since all Socialists are threats to the integrity of our country, then all juvenile delinquents are Socialists, because all juvenile delinquents are threats to the integrity of our country.

7. The poor have little money; but John's health is poor; therefore, John's health has little money.

8. Since no rectangles are three-sided, it follows that some plane figures are not rectangles because some plane figures are three-sided.

9. No illegal immigrant has the right to vote in the U.S. This man is not an illegal immigrant, and therefore he has a right to vote in the U.S.

10. All men are intelligent beings, and all intelligent beings are possessed of free will; hence, all beings possessed of free will are men.

11. Football players are the campus ideal. But John is a football player. Therefore John is the campus ideal.

12. Since no syllogisms are inductive, and some syllogisms are probable arguments, then some probable arguments are not inductive.

13. Since all men have the right to health care, and since the government must ensure that to which everyone has a right, it follows that the government must provide universal health care coverage.

14. Since it is true that all Texans are American, it follows that:

    a. It is false that all Americans are Texans

    b. It is true that all who are not Americans are not Texans.

    c. It is true that some Texans are Americans

    d. It is true that no Texans are non-Americans

    e. It is false that some Texans are not Americans

---

[14] In I Post. Anal., Proem.

State whatever conclusions validly follow from the premises given below:

1. Courteous people are not always talking on their cell phones; irritating people are always talking on their cell phones; therefore...

2. Clever politicians rarely admit a controversial position; careless politicians always say too much; therefore...

3. Nothing that is useful should be avoided; internet theft is useful; therefore...

4. Congress should do nothing that doesn't benefit the good of the American people; but this stimulus bill is for the good of the American people; therefore...

5. Eminent domain gives the government the moral right to take private property which is not being used in the best interests of all; but this private property is not being used in the best interests of all; therefore...

The following is a short passage from John of St. Thomas' book, *Ars Logica*. In the text, he argues briefly for the necessity of Logic. See if you can put this argument into a syllogism:

"The necessity of this art is the greatest both for the reason general to all arts which are necessary, so that a man be directed correctly and without error in his works; and especially because Logic directs the works of reason on which all inference and reasoning depend in order to be correct and to proceed with order and without error. Certainly this is exceedingly necessary for a man using his reason."

Formal Logic of the First Operation: Simple Apprehension

As we've seen, Formal Logic sets forth the rules and laws governing the arrangement of our concepts in the syllogistic process of reasoning. And since we can't reason without judging, and since we can't judge without simple apprehension, Formal Logic is divided into three parts: The Logic of Simple Apprehension, or what pertains to simple apprehension, The Logic of Judgment, or what pertains to sentences and propositions, and The Logic of Reasoning, or what pertains to the syllogism.

So the first operation of the intellect, the first act which is elicited by our mind is called Simple Apprehension. It's the operation by which we 'perceive' or 'simply know' the nature of a thing in an abstract way; i.e., in a way which leaves behind all of that thing's peculiar, individual characteristics. And following our general method of procedure, we will start by asking what simple apprehension is in general (i.e., we will inquire into its definition); then we will examine it specifically by looking at all the different kinds of simple apprehension (i.e., we will examine its divisions). Now, the kinds of simple apprehension are varied according to the kinds of *concepts* produced by simple apprehension. Hence, our division of simple apprehension will be a division of the concept. Furthermore, since language is the external sign which is expressed to communicate our concepts to others, after we examine the concepts themselves, we will examine the signs by which they are communicated.[15]

The Definition of Simple Apprehension

Simple apprehension is defined as the operation by which the intellect knows (i.e., cognizes, perceives, understands, etc.) some quiddity (i.e., essence) without affirming or denying anything about it. By this knowledge or apprehension the *concept* is produced.

Explanation of the Definition

So let's take that definition apart and look at each element. First, simple apprehension is an *operation of the intellect*. This is common to simple apprehension, judgment, and reasoning. All three of these acts are, as we said, operations by which the intellect gradually perfects itself in understanding reality. Second, by this operation the intellect perceives some *quiddity*. A quiddity is the essence or nature of a thing. It is anything that the intellect can understand in a thing and which manifests what the thing is. So 'whiteness', 'humanity', 'knowledge', etc. are all quiddities. Even the notion of 'thing' is a quiddity but in a most imperfect and vague manner. Third, when simple apprehension perceives this quiddity, it stops at that knowledge; it *does not affirm or deny anything about it*. In this way simple apprehension is distinguished from judgment (later on we will call this distinguishing characteristic the 'specific difference' between simple apprehension and reasoning). Judgment is always a uniting or a separating of two concepts, whereas simple apprehension is the conceptual knowledge which precedes this joining or dividing.[16] So I can conceive of an oak tree without affirming that 'oak trees are useful for building', or 'oak trees are tall', or even 'oak trees exist'. It's often very difficult to catch ourselves simply apprehending. Because our mind is always active and naturally developing itself, almost immediately after apprehending 'oak tree' we judge something about it; we associate the concept of 'oak tree' with other concepts almost straight away. Nevertheless, simple apprehension indeed exists. We can't affirm or deny 'tallness' of 'oak tree' unless we understood, at least in the most general way what these things were.

So, I've pointed out three parts of this definition to keep in mind: 1) simple apprehension is an intellectual operation; 2) by it the intellect knows a quiddity or essence; 3) nothing is affirmed or denied by it.[17] Now, the second and third parts can be combined in the definition so that we might say: simple apprehension is

---

[15] In I Periherm., lect. 1.

[16] In III De Anima, Lect. 11.

[17] In VI Meta., lect. 4, n. 1224, 1232.

the operation of the intellect by which *an indivisible* is perceived. That is, by simple apprehension we perceive only one unified essence, not several things composed or divided. A quiddity is a single unified concept. 'Man' or 'whiteness' or 'tree' is a single object of the mind and makes up a single idea or concept. But this doesn't mean that we only simply apprehend individual things. Otherwise, we would never understand the concept of 'forest' or 'football team'. A forest is not a single thing, but rather it is a conglomerate of many things. A forest is a collection of individual trees. A football team is a collection of players. Nevertheless, when we say 'forest' and conceive it by simple apprehension, we aren't simply apprehending the natures of all the individual kinds of trees. When we conceive 'football team' we aren't knowing and cognizing all the individual players that go into making up the team. Instead, we are understanding the individuals under an indivisible formality, or notion. A forest contains many individual trees, but I conceive them all as though they were a single thing; I conceive them all according to an indivisible unified notion—that of 'forest.' The object of apprehension in these cases is not the individual but all the individuals taken as a single whole. The notion of 'forest' is logically or conceptually one 'thing' or quiddity which can be understood, even though in reality it is made up of many individual things, each with its own quiddity. Recalling the distinction we made earlier of the material object and the formal object, the intellect simply apprehends many individual material objects under one common formal object, namely 'forest' or 'team'. When we look at a dog and conceive 'animal' for instance, we are considering the material object (i.e., the dog), under a particular formal aspect (i.e., its animality). And even though 'animal' is something which can pertain to any sensitive living thing, the concept of 'animal' is itself a single, unified concept. And when we conceive 'animal' we are neither joining it nor separating it from any other concept. That is, the formal object 'animal' is an indivisible notion, being neither joined nor separated from anything extrinsic to the concept of animal itself.[18]

This isn't to say that the concept cannot have several elements. When I say 'learned man' I'm referring to a single quiddity, a single essence—I'm not referring to several quiddities as I would be when saying 'a learned man is wise'. Nevertheless, 'learned man' has several elements which make it up; i.e., man as qualified by learning. If I were to say 'man is learned' then we have a different story. That would be a judgment. So the object of simple apprehension can actually be quite complex, yet it is conceived precisely as a single, undivided essence, a single quiddity. Not only is the concept of 'four-legged featherless robot fueled by vodka', the understanding of a single essence (though very complex) but even the concept 'every man who ever lived' is the concept of a single unified quiddity. In this last case every individual man who ever lived is conceived by the mind not individually—I don't consider one person then another then another and so one until I think about every man who ever existed—but they are apprehended by the mind under a unifying formality; namely, 'having lived'. Simple apprehension, then, is apparently not so simple.

So, simple apprehension abstracts some one intelligible formal object out of the many material objects that we know by the senses. We saw in the introduction to Philosophy that the mind cannot grasp all the intelligible characteristics of a thing at once. Instead, it has to separate each attribute one by one and examine them singly. And this process of separation, this abstraction of the intelligible notes, leaves behind all the singular traits of the individual. Thinking of 'man' abstracts from every particular man; from John and Peter and Mary and everyone else. It gives us a universal intelligible object that can be applied to an infinite number of individuals, be they real individuals or only imagined individuals. Now, existence is an individual trait. Not every man exists; some men *did* exist but are now dead. Some men *will* exist but don't yet. So the object of simple apprehension, by being abstracted from all individual aspects, also abstracts from the very act of existing. That is, when I conceive 'man' I don't necessarily conceive of man as existing. Hence, the concept of man is open to existence but this existence need not be realized in any particular object in order for me to have the concept. Take the dinosaurs. They are long gone. But I can still ponder the possibility that dinosaurs might one day walk the earth again. And I can do this because the concept of 'dinosaur' is 'existence-neutral', if you will. And when I conceive 'dinosaur', I neither conceive dinosaur as *actually* existing nor do I conceive dinosaur as *incapable* of existing. Existence, as an individual characteristic of those dinosaurs that lived so long ago, is not a

---

[18] In II Periherm., lect. 3, n. 3; De Spirit. Creat., a.9, ad 6.; In I Post. Anal., lect. 1, n. 4;

necessary note of the concept 'dinosaur'. The concepts of the mind abstract from the notion of existence. Hence, we make a distinction between the *essence* of something and its *existence*. The essence is the object which is abstracted from individual characteristics and can be applied to all real and possible men; whereas existence is the act of an essence individuated in some particular—the *essence* of dinosaur has *existence* in this tyrannosaurus; the essence of man has existence in John.

But there is something very important to notice here. Abstraction means to separate one thing from another. And it can take place in two ways: *objectively* and *subjectively.* When I think 'dinosaur' I don't have to be thinking 'existence' at the same time. In fact, I can separate the two and consider one or the other. In the same way, I can think 'cake' without thinking of 'white cake' or 'brown cake' etc. I'm not saying that cake is not brown or white, but in simply apprehending the quiddity of cake I abstract from any consideration of its color. I'm not thinking 'cake is not white', I'm just not thinking about its color at all. This is called *objective abstraction*. In objective abstraction I am simply considering one intelligible object within the subject without thinking about any other object. So when I look at an oak tree and think 'brown' without thinking 'tall', I'm *not* thinking that an oak tree has color but not height. I'm simply *not thinking about height at all*. I'm abstracting one object—namely, the color—from the tree, which is the subject under consideration, and I'm not considering any other objects—neither the height nor the width nor the temperature nor the health nor anything else. I'm am simply *understanding* one object apart from the other. This is the kind of abstraction that we're talking about in the abstraction of simple apprehension.[19]

The case is different if I were to conceive of 'oak tree' precisely as something which excludes 'height' or 'browness'; that is, if I conceive of 'oak tree' as something which cannot possibly be brown then I have *subjective abstraction*. I'm not thinking about two different objects in the same subject as when I consider the color of cake apart from its sweetness, but I'm considering things which must exist in separate subjects. This kind of abstraction is had by *negative judgment*. For example, when I judge that man is not a stone, then I have an existential separation of two subjects. Man and stone can never be identified (that is, found together) in the same subject. This is not to conceive separately of two different objects, but to conceive of two things precisely as separate in reality.

Now, objective abstraction is always permissible for the mind as long as the two objects are intelligibly different. I can consider the whiteness of the cake without considering the sweetness of the cake and I haven't in any way falsified what I know. On the other hand, subjective abstraction is allowable only when the two notions are separated in reality. If I consider that this cake doesn't include whiteness in it when in fact the cake is white, then my mind is misrepresenting reality. The object of simple apprehension is never the whole of the thing under consideration; I don't know all about oak trees in a single intellectual glance. But considering the attributes of an oak tree one by one doesn't necessarily give me a false understanding of reality: partial knowledge is not false knowledge. If I consider the whiteness of the cake apart from its sweetness, I haven't misrepresented reality any more than the eyes have misrepresented it by seeing the cake apart from its taste. But if I judge that this cake exists without whiteness, then indeed I have distorted the way things are.

So, simple apprehension separates certain intelligible objects from the subject under consideration and it considers these abstracted objects one by one. Each of these objects provides the intellect with an understandable formality, such as 'whiteness' or 'height' or 'dogness' or 'humanity' etc.. And the intellect represents this formality within itself by means of the *concept*.

The Concept[20]

---

[19] I, q. 49, a. 3

[20] In I Perih., lect. 3, n. 13; SCG, L. II, c. 75.

The concept is a representation constructed in the mind and by the mind in which we understand or perceive a thing. It's by means of our concepts or ideas that we understand the quiddity or nature of things. But remember that we don't understand everything about that quiddity or essence all at once. Let's make a few distinctions. First, there is the material object in reality (e.g., a dog). Second, there is the formal object which we perceive in the material things (e.g., the sight perceives the color, touch perceives softness, and the intellect knows 'dogness'). This formal object really is an aspect of the material thing (the color and softness really exists within the dog), but it is being considered separately by the intellect. Even though the material object is in reality a single, simple thing, it nevertheless offers many perfections or attributes according to which it can be considered by the intellect.[21] So 'man' can be considered as 'animal' as 'rational' as 'species' etc. Each of these is a different formal object abiding in the same material object. And, if you'll recall, all of these distinctive objective aspects by which man is made known to us (i.e., by which we distinguish the concept of 'man' from all other concepts) are what we call the 'notes'. Notes are the objective characteristics from which our complete concepts are constructed. So if man is conceived as a rational animal, then animality and rationality are the notes that go into our concept of man. If man is conceived as a 'featherless bipedal animal' then 'featherlessness' 'bipedal' and 'animality' are the notes of the concept of man.

The Properties of the Concept: Comprehension and Extension

Now, the sum total of all the objective notes (i.e., the entire complex of intelligible aspects that we perceive in the thing) are what we call the *comprehension* of the concept. It is the collection of notes which constitute the concept. For example, the comprehension of man must include rational, animal, living, corporeal, and substance. The more notes that a concept has, the richer that concept will be. So if someone had a concept of man which only included animal and living, he would have a pretty vague idea of what man is. Take another example: parallelogram. The concept of parallelogram has a number of intelligibly distinct notes which make it up. It has the notes of plane figure, four sided, rectilinear, and parallel opposite sides. If someone had a concept of parallelogram which only included the note of 'plane figure' then his concept would be very general and imperfect. All that he would know is that a parallelogram is some kind of shape. He wouldn't even know that a parallelogram was different from a circle because a circle as well is a plane figure. To perfect his concept, he must discover the remaining characteristics of a parallelogram, gradually enriching his knowledge. The concept of square will be one which is even richer than that of parallelogram; besides plane figure, four sided, rectilinear, and parallel opposite sides, the perfect comprehension of square would also include the note of 'equilateral' and 'rectangular'; that is, all sides being equal and meeting at 90 degrees. So our concepts become more complex and richer the more objective notes that they contain. However, don't make the mistake of thinking that all of these notes exist separated from one another in reality. No one part of a square is a plane figure while another part is a parallelogram. Rather the whole square is a plane figure and the whole square is a parallelogram. It is, remember, the mind that separates these aspects (or formal objects) by abstraction. These notes may not be distinct in reality, but they are intelligibly distinct; i.e., they can be understood apart from the others. And the complete comprehension of our concepts is the sum total of all these notes taken together.

Now, when a note is added to a concept it makes that concept to be less and less general, and more and more specific. That is, the notes are related to each other as general to specific. Take two of the comprehensive notes of man, corporeal and living. Now, corporeal is a general note which applies to every physical substance: every substance which exists in physical reality is corporeal (i.e., it is a body). But not every substance in the physical world is alive. Rocks are not alive; chemicals are not alive, etc. So by adding the note of living to the note of corporeal, we are making the concept of man more specific, we are taking the general notion of corporeal and determining it to be a specific kind of corporeal thing; namely, a *living* corporeal thing. And we can even add the note of sentient to the comprehension and specify the concept further. It now becomes a *sentient* living corporeal thing. Each note further determines, perfects, and specifies the general and vague concept that we have of man.

---

[21] I, q. 15, a. 1; SCG, L. I, c. 53; SCG, L. IV, c. 11.

Now, we very often are not aware of all these notes distinctly. Nevertheless, they are present in our concept and our concept is precisely the concept of this or that thing because of these notes—it's because of a difference in notes that the concept of man is different from the concept of dog. If there was no difference in the intelligible content of our concept of dog and the content of the concept of man, then we would conceive all men to be dogs and all dogs to be men. So all the notes are indeed contained in the concept, even if confusedly. One of the goals in Logic is to teach us how to spell out very clearly all the notes that should be present in a concept; we'll learn how to do this when we learn about definition. Defining, as we'll see, is the act of making explicit all the comprehensive notes which are contained in our concepts implicitly. In fact, all scientific investigation into the nature of a thing is to determine what notes always and everywhere pertain to it and what notes do not. All rational inquiry into the essence of a thing is a gradual building up of its intelligible notes until we have exhausted everything that can be known about it. So simple apprehension doesn't immediately pull out the entirety of a thing's essence; we don't abstract everything there is to know about something at a single glance. Our intellectual knowledge is at first very obscure. As babies we possess only the most basic notes within our concepts: ideas such as 'something' or 'body'. Little by little, our sense knowledge, and especially our memory, will help us to tell what observable traits in a thing always and everywhere pertain to this thing. Then we abstract the notion of that trait and include it in the comprehension. So at first children have only the simplest concept of their parents and so they call all men 'dad'. Slowly, they add notes which will help them understand what it means to be a father until they identify their father with only one particular male. Oftentimes, though, it is quite impossible to pull out every single comprehensive note; as we'll see, some things cannot be properly defined because they elude our minds.

Comprehensive notes are a bit like clues in a detective story. The fewer clues I have, the more suspects I have. So, if I have a concept which includes only the note of corporeal substance, then my concept can refer to any physical body. But if I add to this comprehension the note of living, then I've narrowed down the number of things that this concept can extend to. Now, it doesn't refer to every physical body, but only living physical bodies; i.e., plants and animals. The collection of things to which any given concept will apply is called the *extension* of the concept. You see, because the concept is abstracted from particulars it is universal. And as a universal concept it can apply to any number of singular things. So, the concept of man can be said of Joe, John, Mary, Peter, etc. All those subjects to which the concept applies is called its extension. The extension of plane figure would include circle, square, triangle, etc. And the extension applies not only to existing things, but to possible things a well. Man can be said of Sherlock Holmes even though he never really existed. Now, the fewer notes contained in the comprehension of concept the greater will be the extension of that concept. So if a concept contains only the note of *substance*, then it will pertain to every possible substance, including immaterial substances. If however the note of *material* is added to the note of substance, the we will have excluded immaterial realities from the extension; i.e., the concept can no longer be said of immaterial realities. Again, if we were to add the note of *living* to the comprehension, then the concept would apply to an even smaller multitude since it would exclude all inanimate things. So there is an inverse proportion between the richness of our concepts (i.e., the number of notes they contain) and the number of things to which they can apply. That is, there is an inverse proportion between comprehension and extension.

Take a look at the following at the following diagram to help you understand this:

CONCEPT	COMPREHENSIVE NOTES					
Man	Substance	Material	Living	Sentient	Rational	Man
Animal	Substance	Material	Living	Sentient	Brutes	Man
Organism	Substance	Material	Living	Plants	Brutes	Man
Body	Substance	Material	Inanimate bodies	Plants	Brutes	Man

Substance	Substance	Spirits	Inanimate bodies	Plants	Brutes	Man
	EXTENSIVE SUBJECTS					

Scientific inquiry is a gradually adding up of all the notes in our concepts of reality. So originally it was thought that there were only four elements. But new properties (i.e., new notes) were discovered in various chemical elements that differentiated one element from another. From general and vague knowledge of elemental composition we came to clearly distinguish elements; we came to perfect our concepts of elemental reality. Slowly the table of the elements grew from four up to its present state. As children we didn't start out with a knowledge of the various types of birds. We would point to a bird and say 'bird'. We wouldn't point to a bird and say 'wood warbler', because our concept of bird included no notes that would distinguish a wood warbler from a mockingbird, or a mockingbird from a magpie. No, our original concept of bird was, comprehensively speaking, very pathetic. It perhaps contained the notes 'winged' and 'small'. The rest of the notes came only much later and after observing many different birds.

We shouldn't make the mistake, though, of thinking that all the comprehensive notes we pack into our concept are of equal value. Not everything we can say about a thing will perfect our knowledge of that thing's nature or quiddity. As we'll see later, some notes pertain to the comprehension essentially, while others non-essentially or accidentally. Having two-legs, for example, is certainly an attribute of man. Nevertheless, it isn't a note which pertains to him essentially; otherwise cutting off a leg would destroy his human nature. As we'll learn, science is only interested in what pertains to the essence or quiddity of a thing, not to any accidents or non-essential characteristics.

Now, all those subjects which fall into the extension of some concept are called inferiors. While the concept itself, together with all its comprehensive notes, is called the *superior*. So 'living being' is a superior and 'plants and animals' are the inferiors which fall under superior concept. A superior can be *said of* an inferior. Thus, 'animal' can be said of my dog, because she falls within the extension of 'animal'. This is also called *predication*; animal can be *predicated* of my dog; organism can be predicated of my son; substance can be *predicated* of every human being. We also call superiors 'logical wholes' while the inferiors are 'subjective parts'. So 'sentient being' is a logical whole and it may be divided into subjective parts of 'brute' and 'man'. Now, a logical whole is different than what is called an integral whole. Consequently, subjective parts are different than integral parts. An integral whole is physical composite which is really the sum total of all its parts. So the human body is really composed of a head, a chest, arms, legs, etc. And if these parts are separated the body is destroyed. A logical whole, on the other hand, is not the sum total of its parts. The concept of bird for example is not a concept that is arrived at by adding up all the various types of birds. In fact, even if there was only one type of bird, the concept 'bird' would not in any way be altered. Likewise, animal has for its subjective parts 'brute' and 'man'. But even if brutes didn't exist and man was the only animal, the concept of 'animal' wouldn't be cut in half; whereas if a circle is divided into two integral parts, the removal of one part would halve the circle. We don't get the concept of animal by adding together man and brute.

Furthermore, objects which are inferior to one concept may be superior to another. Animal is a logical whole in relation to the logical parts of brute and man—it is a superior. But in relation to 'living being' animal is an inferior; living being, or organism, is a superior which is divided into plant and animal as its logical parts. Singular things, however, cannot ever be superiors. Why? Because they have no extension. The nature of Peter can never be applied to Mary; that is, the particular concept we can form of Peter can never include Mary within itself.

Comprehension and extension are two examples of the logical properties that we mentioned in the introduction to Logic; they are *second intentions*. The extension of 'man' doesn't exist in John, rather it exists only insofar as John's human nature is conceived by my mind. John in reality doesn't have 'animal' in one part of himself and 'man' in another; its the intellect which separates these notes and

creates the comprehension. Likewise, John has no extension. 'Johness' can't be said of anything but John himself; he is a singular, incommunicable, 'un-predicatable' individual. The relation of the notes to each other as the constituent elements of our concept is a purely logical relationship. So in addition to the logical second intentions that we've already mentioned as example—noun, verb, subject, predicate, proposition, and so on—we must now include comprehension and extension. Neither of these has something exactly corresponding to them in reality. They are relations between formal objects that can be understood in the thing (comprehension) and relations between superior and inferior concepts (extension), and these relations exist only in the mind.

Furthermore, comprehension is the logical foundation for extension. That means comprehension has a kind of logical priority over extension; it is the number and type of comprehensive notes that determines the number of members within the extension. And an alteration in these notes will alter the extension. The comprehension of our concepts determines the extension of our concepts. In other words, extension is a *logical effect* of our comprehension.

One more point, the comprehensive notes given in the chart above are not the only comprehensive notes. 'Four-legged' might be a note that makes up your concept of dog; 'spiritual' might be a note that makes up your concept of man. And each of these notes will have its own extension: four-legged extends not only to dogs, but to elephants, to cats, even analogously to chairs and tables, etc. But some of these notes are *essential* or pertain to the very essence of the thing under consideration; while some are only *accidental* or incidental to the essence. So 'fat' is note that can extend to any given man who happens to be soggy around the midsection; but it isn't an essential note of the universal concept of 'man'. 'Four-legged' isn't essential to the dog and hence isn't an essential note of our concept of dog; a dog can have three legs and still be a dog. The chart above only uses the notes of 'substance', 'material', 'living', etc. as *examples* of intelligible notes. Later when we deal with what are called the 'predicables' and the 'predicaments' we'll learn that the examples given in the chart are the most *perfect, essential,* and *direct* divisions of these concepts, but certainly not the only divisions. Furthermore, don't make the mistake of thinking that the notes in the chart above are *ultimate*, or that they can't be themselves broken up into further intelligible notes. 'Living' for example can be itself analyzed into various comprehensive notes which make up our concept of 'living'; e.g., 'self-moving' is a note that goes into the comprehension of 'living'. All of this will become much more clear when we deal with the *predicables*, and especially with what are called 'genus', 'species', 'difference', and the 'tree of Porphyry'. For now, just understand that each concept has distinct, intelligibly knowable elements, the sum total of which we call *comprehension*. While the sum total of members of which this concept can be said is called the *extension*. 'Fruit' has its own comprehensive notes different from what we've given above, and we might divide its extension into 'red fruit', 'green fruit', etc. Or we might divide its extension into 'sweet fruit', 'sour fruit', etc.

A Warning: The Concept and the Phantasm

To clear up any difficulties before we go on, a distinction must be made between the concept and what is called the *phantasm*. The phantasm is that sensible image that you have 'in' your head. It's caused by the imagination and it generally has some hazy sensible qualities. If you're thinking about 'man' for instance, your thought might be accompanied by a blurry image of a medium build individual with the outlines of a face and perhaps a hint of color. Most of the features are a bit unclear, but you definitely have the image of some individual in your head. This is most certainly not what we mean by the concept! This murky image is called the phantasm and it is the representation of a thing produced by the imagination. Now, the imagination is one of our internal senses; and, if you'll recall, sense knowledge is always of some particular thing, not the universal. So the phantasm is always an image or a conglomeration of images which represent some particular material thing, whereas the concept is in the intellect and can represent the universal. The image in the imagination is always some particular man, whereas the concept can be of 'man' in general. The phantasm is a sensible representation which is infinitely variable depending on what sense qualities you decide to include in it. The concept represents 'what' man is and is always the same. To prove that the phantasm and the concept are distinct, consider the following: you cannot imagine a chiliagon. And what on earth is a chiliagon? It's a thousand-sided plane figure. Now, you

understand what I mean by a thousand-sided plane figure: it's a two dimensional shape having 1000 sides. You can certainly conceive the concept; but I challenge you to picture it. You can't imagine exactly what it looks like, you can't form a representation of it in the imagination, nevertheless you have the concept. So you can separate the image from the idea. But things which are separable are distinct. Hence, the phantasm most assuredly is not the concept.

At this point, we've given a general overview of simple apprehension and its product: the concept. Now we will look at the division of the concept. And the concept can be considered in two ways: absolutely and according to what it is in itself, or in relation to other concepts (i.e., how two or more concepts are related to each other). So we will look at, first, the division of the concept in itself; and, second, the relation of several concepts among each other.

EXERCISES: Let's give you a little practice in recognizing comprehension and extension.

1. **Which has greater extension, animal or man?**
2. **Which has more comprehensive notes, animal or man?**
3. **Which has greater extension, substance or plant?**
4. **Which has more comprehensive notes, substance or plant?**
5. **Which has greater extension, organism or body?**
6. **Which has more comprehensive notes, organism or body?**
7. **Give the comprehensive notes of man:**
8. **What do you comprehend of a person you see walking down the street?**
9. **What do you comprehend of Gandalf? (Remember our distinction between the concept and the phantasm)**
10. **What are some of the intelligible elements of dog?**
11. **And of mineral?**
12. **By investigating reality what does the scientist seek to do with comprehensive notes?**
13. **What is the extension of substance?**
14. **And of animal?**
15. **And of man?**
16. **And of John Smith?**
17. **Of WHAT is extension the sum total?**
18. **Of WHAT is comprehension the sum total?**
19. **If you comprehend man, do you comprehend animal?**
20. **If you understand the quiddity of animal would you thereby understand the essence of man?**
21. **Arrange each of the following in the order of DECREASING extension:**

a. **Substance, body, living being, coniferous, tree, fir**

b. **Frenchman, European, man, Parisian**

c. **Italian, European, Earthly, planetary, roman, northern**

22. **Explain why comprehension and extension are *logical* properties and not *physical* properties.**

23. **Give at least two examples of the extension of each of the following concepts: athlete, bird, school, horse, element, planet, nation, money, paper, vegetable.**

24. **Give, in whole or in part, the comprehension of each of the following concepts: the mosquito and the fly; the Secretary of State and the Secretary of Defense (and, yes, political satire is appreciated here); hydrogen and oxygen; the rose and the violet; the magazine and the newspaper; the circle and the square; red and blue; the house and the church; a gun and boxing gloves; an airplane and an automobile.**

Division of the Concept

So we've examined very generally what simple apprehension is and what a concept is; and we've discussed two attributes or properties that every concept has: comprehension and extension. Now, we are going to look at the various kinds of concepts there are; i.e., we are going to divide the concept into its specific types—first, according to the various kinds of concepts that there are when the concept is considered singly and in itself, then, according to the various kinds of relations one concept can have to another. Why do we have to do this in order to perfect our reasoning (the goal of Logic)? Because oftentimes, confusing various types of concepts will render our syllogism invalid, as we will see later. To give a very obvious example of this: Every triangle has three interior angles equal to 180 degrees; but John's love situation is a triangle; therefore, his love situation has three interior angles equal to 180 degrees. Obviously, 'triangle' here refers to two different concepts. Though this is a fairly obvious error, many mistakes involving a confusion of concepts are more subtle and require training to spot.

Now, a concept can be looked at in two ways, materially and formally. Considering the concept *materially* is to consider the concept according to the object in reality that the concept makes known; for example, the concept of a dog, or of a car, or of a man, etc. etc. If we were to divide the concept according to the things it makes known—that is, if we were to divide the concept materially—there would be as many concepts as there are things in reality that can be known. In Material Logic, we will arrange all things in reality that can be known into ten ultimate categories called the 'predicaments' and hence we will have divided the concept materially. But this doesn't concern us right now. In Formal Logic, we're interested in what pertains to all concepts in themselves regardless of any particular thing that they make known to us. We are interested here only in how the concept can be divided *formally;* that is, according to the nature of a concept itself, not according to the nature of the things in reality. Now, a concept is essentially a representation—to stand as a substitute in our mind for the realities that we know and to represent those things is of the very nature of a concept. Hence, to divide the concept formally is to divide it according to *how* it represents the things in reality to our mind. In this way, the concept is divided according to the different ways that one and the same thing can be known or represented. And this happens in three ways: 1) from the point of view of the *logical (or formal) object*, according to whether the thing's comprehension or extension is represented; 2) from the point of view of *perfection*, according to whether the concept well or poorly gives us knowledge of the thing; 3) and from the point of view of *origin*, according to how we get the concept.

Division of the Concept by Reason of the Way it Represents Objects

The formal or logical object can be considered in two ways, as we've seen: either comprehensively or extensively. Comprehensively, the object is certain totality or indivisible constituted by a number of intelligibly distinct notes. Extensively, the object is taken for all those subjects and individuals to which the whole set of comprehensive notes can apply. The concept can make known or represent both the comprehension and the extension, and it does so in different ways. And since comprehension is the foundation for extension (as I pointed out in the last section), we'll start with the different ways that a concept signifies the comprehension of the object; then, the different ways that the concept can signify the extension of the object.

Division of the Concept by the Ways it Signifies or Represents Comprehension

Incomplex and Complex Concepts

By reason of comprehension, the concept is first divided into *incomplex concepts* and *complex concepts*. An **incomplex concept** is one which *represents strictly one, single quiddity or essence* (e.g., the idea of 'man', the idea of 'learnedness', the idea of 'whiteness') and so one collection of comprehensive notes; whereas the **complex concept** *represents strictly several essences or quiddities conceived as a single quiddity* (e.g., learned white man), and so represents two or more collections of comprehensive notes as though they were one. Remember, both of these kinds of concepts are known by simple apprehension; in

other words, 'learned white man' is still a single *concept* though it is composed of several elements which are separable in reality. It is not a judgment—I'm not saying 'the man is learned and white.' The complex concept not only has all the intelligible comprehensive notes of 'man' but it has other notes besides (i.e., learnedness and whiteness) which are over and above the notes required to conceive 'man'. And all of these notes (learnedness, whiteness, and man), though in reality different and separable, are conceived as a single indivisible quiddity. So, how do we know if what we are conceiving has one or several quiddities? For example, if we were to conceive of man as 'rational animal' would this be a complex concept since it has two elements, 'rationality' and 'animality'? No. We have multiple quiddities only if one is not contained within the essential comprehensive notes of the subject we're considering. Rationality and animality pertain essentially to the nature of man, and so conceiving of man as 'rational animal' doesn't join two quiddities but simply makes explicit two aspects of one and the same quiddity. 'Learned', on the other hand, does not pertain essentially to man—some men are idiots (I'll give you a list of examples, if you'd like). So by joining 'learnedness' to 'man', you aren't simply pointing out a note which is implicitly contained in the concept 'man' but you're adding to that concept of 'man'; you're pointing out one real thing, man, which is qualified by another real thing, learning. Later, we'll learn that each distinct essence is distinct precisely because it can be placed into a different category or *predicament*: man will be placed in the predicament of substance, while learnedness will be placed in the predicament of quality. So we need to make a distinction between *incomplex concepts* which are *incomplexly stated*, and *incomplex concepts* which are *complexly stated*. So, the concept of 'man' is an incomplex concept because it refers to a single nature; i.e., that of man. But when I express this concept as 'rational animal', I'm *stating* the concept complexly. Again, we have to distinguish between *complex concepts* which are *complexly stated*, and *complex concepts* which are *incomplexly stated*. So 'learned man' is a complex concept because it signifies two essences which are distinct in reality; i.e., learnedness and man. And it is also complexly stated because each of those elements is given very clearly. However, if we were to state the concept of 'learned man' as simply 'scholar', then the complex concept is being stated incomplexly; i.e., without distinct parts. And keep in mind that each complex concept (i.e., a concept which refers to several really distinct essences) can be broken apart so that each of the distinct essences can be considered as incomplex things: in other words, the complex concept of 'learned man' can be broken up into the incomplex concepts of 'learnedness' and 'man'.

Now, concepts always represent various comprehensive notes, as we've seen. And these comprehensive notes exist together within the thing under consideration: 'living', 'sentient', 'rational', etc. all together make up the nature of man. But these notes can be represented by the concept in two ways: precisely as notes and as parts making up the whole quiddity of man; or else as separated from the quiddity of man and considered as things in themselves. That is, an intelligible attribute can be understood or conceived as a *part* of the object in which it was discovered—as a comprehensive note of the thing—or as *completely separated* from that object—not as a comprehensive note, but as a new thing. From this point of view, concepts are either **concrete** or **abstract**. So, in the comprehensive notes of 'man' we find the note 'sentient' or 'having senses'. We can, however, consider 'sentient' not as it is a comprehensive note, but as it is a thing in itself and totally abstracted from the other notes. In that event, 'sentient' becomes 'sentience'; or 'rational' becomes 'rationality'. Furthermore, some incomplex concepts include within their comprehension *a relation* to another subject besides the object that they immediately represent, while others do not include within their comprehension a reference to another subject beyond themselves. From this point of view, concepts are either **connotative** or **absolute**.

Concrete and Abstract Concepts

So, *incomplex* concepts are of two kinds: *concrete* and *abstract.* The difference is between the ways the concept represents the thing we encounter in reality. When a concept represents a substance in reality, then it is called concrete, because it can be said of concrete, individual things. So, man is a concrete concept because we can say 'Peter is a man'. Likewise, when the concept represents what really is a part of a substance *precisely as* a part, the concept is also concrete. When I think 'rational' I'm conceiving a part of man precisely as a part. Hence, it can be said of concrete things: Peter is rational. On the other hand, when the concept represents what is really part of a substance not *as* a part but *as though it were a*

substance itself, we have an abstract concept. When I think 'rationality' I'm no longer considering what is but a part of man's comprehension (i.e., rational) precisely as it is a part; rather, I'm thinking of it as though it were a single thing itself. So, a concrete concept, most generally speaking, is one which represents or signifies a substantial thing or a comprehensive note of a substantial thing considered precisely as a comprehensive note; whereas the abstract concept signifies or represents a note considered *apart* from that substance and as a thing in itself. This is the difference between 'rational' and 'rationality'; between 'man' and 'humanity'; between 'living' and 'life'; between 'white' and 'whiteness'; between 'strong' and 'strength'.

Recall, once again, that the intellect doesn't know everything there is to know about an object at a single glance. Instead, it distinguishes various intelligible or formal objects from the material objects that we encounter in reality; thus, man can be considered as living, as animal, as rational, etc. And all these notes *taken together* constitute the comprehension of our concept man. When I consider 'rational' in the concept 'man' I'm considering it precisely as one of the notes, as an element making up the concept 'man'—'rational' is known as a part of the nature or quiddity of man, as a part of that external thing encountered in reality. This is what we call a concrete concept, and it is had by a very simple process of abstraction from the individual thing (so, every adjective is a concrete concept because it refers to a trait or characteristic precisely as it exists within the thing—strong, black, smelly, etc.). But we can also perform *another* abstraction by which 'rational' is separated entirely from the thing we've encountered in reality and is, instead, considered as a thing in itself. By this second abstraction, the mind knows an intelligible object (i.e., some attribute which was first found in the external thing) apart from the quiddity of the thing. 'Rationality' is considered precisely as a thing and not as a part of the comprehension of 'man'. This is what we call an abstract concept. 'Man' is a concrete concept because it represents what the thing is in reality, and it is an aspect of the thing *considered as an aspect*. 'Humanity' is an abstract concept because it refers to human nature *considered as a thing* in itself and apart from the other notes of 'living', 'sentient', etc. Likewise, 'living' is a concrete concept because it is considered as part of the substance man, but 'life' is an abstract concept which is separated from every other note in the comprehension of man.

Now, any given concrete concept can be made abstract by further separating it from that thing of which it is a part; that is, by separating it from the other comprehensive notes. Organism has the notes 'substance, material, and living'. 'Living', then is considered as a part of the comprehension of organism and as such it is concrete. But 'living' becomes 'life' when it is abstracted from the other notes of 'organism'. But the abstraction need not stop there. 'Life' has its own comprehensive notes; for example, 'self-moving' would be a comprehensive note of 'life', because something is said to live when it moves by an intrinsic principle. So self-moving is a concrete concept which goes into making up the concept of life. But we can abstract 'self-moving' from the other notes of life and consider it, not as a part, but as another whole: namely, 'self-motion'. So, concrete concepts can be made abstract by separating them from whatever whole they are in. And for any given intelligible attribute discovered in a thing, there can be an abstract concept, though these are very rarely named: e.g., there is no name for the abstract concept corresponding to dog, so we call it 'dogness'.

So, again, when I think 'rational' I'm thinking of the trait of 'rationality' applying to some subject, as being a modification or a part of some subject. In this way, we can say 'rational' of Peter—'Peter is rational'—because rational is conceived as a part of Peter's nature. On the other hand, 'rationality' is conceived, not as a part of Peter, but as a thing in itself and independent of a subject. Hence, we cannot say, 'Peter is rationality' anymore than we can 'Peter is a stone.' To put this in other terms, the **concrete concept** *signifies THAT WHICH IS*; whereas the **abstract concept** signifies *THAT BY WHICH a thing is.* So, Peter is 'rational' *because of* 'rationality'. Yet, since 'rationality' is conceived as a thing in itself and as excluding a subject in which it inheres, it cannot be 'said of' or 'predicated of' Peter: we cannot say 'Peter is rationality.' Again, we cannot say 'Peter is humanity.' Rather, we say 'Peter is man', and it is BY his humanity that he is a man. In the first case, 'man' is conceived as a formality found in the subject Peter—man is what Peter is; while in the second case, 'humanity' is conceived as a thing in itself and not a determination or formality of some subject—humanity is that *by which* Peter is man. '100' is an

abstract concept, whereas '100 men' is a concrete concept. So again, a concrete concept is one which signifies that which a thing is (a subject with a form); an abstract concept is one which signifies that by which a thing is (the form alone). Or, in other terms, the difference between concrete and abstract concepts is the difference between conceiving some substance or comprehensive note precisely *as* a substance or comprehensive note versus conceiving some comprehensive note as a new thing with its *own* comprehension.

Absolute and Connotative Concepts

Incomplex concepts can again be divided into two kinds: *absolute* or *connotative*. Most concepts represent an object which exists by itself and independently of another thing outside of itself. 'Man', for example, is the concept of a substance which exists in itself and is not a determination or alteration of another substance—we call it an *absolute* concept because it doesn't necessarily imply another subject besides itself. That is, there is nothing in the comprehensive notes that isn't found in the singular existing thing encountered in reality—its comprehensive notes contain a relation to nothing outside of this substantial thing. But sometimes concepts imply, above and beyond themselves, a relation to another subject, so that its very signification includes a reference to something else. This we call a connotative or relative concept.

Many connotative concepts are easy to recognize. The concept of father necessarily includes within its comprehensive notes a relation to some child; without this reference, 'father' could not properly be conceived; 'husband' cannot be understood without including a relation to 'wife' in its comprehensive notes; 'higher' cannot be conceived without including in its notes a relation to something which it surpasses in height; 'friend' cannot be conceived without implying the subject of friendship. But some concepts don't immediately strike us as being connotative. 'White', for example, is the concept of something which determines and qualifies some subject—there must necessarily be, then, a subject which is determined and modified by it; i.e., there must be a white *thing*. So this *connotative* concept always implies, or connotes, some subject which is made white.

Because of this, we can divide connotative concepts into two kinds: strictly or *essentially connotative* concepts; and not-strictly or *non-essentially* connotative concepts. The concept 'white' is *not essentially* connotative, because it can be abstracted from any given subject to give us the concept 'whiteness'. 'Whiteness' does not necessarily imply a relation to anything, whereas 'white' does. 'Father', on the other hand, is *essentially* connotative. Even when it is separated from the comprehensive notes of a thing which is called 'father' and we get the abstract concept 'fatherhood', it still necessarily implies or connotes a relationship to 'offspring'. 'Near' is a concrete concept that yields the abstract concept of 'nearness', but 'near' and 'nearness' both essentially connote a relation of distance between two objects. So the difference between essentially connotative concepts and non-essentially connotative concepts boils down to one thing: relation.

In Material Logic, we will look at the ten ultimate categories into which all real beings (except God) can be placed—these, again, are called the predicaments. And when we deal with the predicaments we will learn about the various kinds of accidents or attributes that a thing can have. 'Color', for example, will be placed in the predicament of quality, while 'circular' will be placed in the predicament of quantity, and 'clothed' will be in the predicament of possession, and 'sitting' will be in the predicament of 'position', etc. Now, there is one very peculiar predicament called 'relation'. And relation always and everywhere will include at least two terms. For example, 'faster' is a relation which will always imply something which is slower; 'up' is a relation which always imply 'down', etc. So whenever we have an attribute or accident which is a relation it *always* refers to at least two things in its comprehension. 'Father' is always related to 'offspring'; 'offspring' is called the *term* of the relation. Now, when father is conceived by the mind but son is not, there is still a necessary implication—'offspring' is still connoted or implied; that is, the *term* of the relation is still implied. So when a concept represents a relation—be it concrete or abstract—and the term of the relation (for example, 'offspring') is not explicitly and clearly included in the concept, that concept will *always* be connotative. So, *essentially* connotative concepts are *always*

concepts of relations, but *not every* concept of a relation will be connotative. If I conceive 'the father of John', this concept is not connotative because the term of the relation (i.e., John) is clearly stated and not merely implied. In other words, the term of a relation can be either implicit or explicit. For example, 'faster' is a relationship of speed. If I think simply 'a thing which is faster', then the term of this relationship (namely, that which is *slower*) is not explicitly stated; but if I think 'a thing which is faster than light', then the term of the relation *is* explicitly stated. Now, explicit is imposed to implicit. So, if a connotative term is one which contains an *implicit* relation to another, then concepts of explicit relations are not connotative.

Now, an absolute concept is conceived as though it were a self-contained substance without a reference to anything else; but it need not necessarily *be* a substance. 'Man', for example, is conceived as a substance and really is a substance. 'Whiteness', however, is not really a substance yet it is conceived as though it were a stand-alone substance without a reference to a white subject. 'White', on the other hand, is not thought to be some particular thing, but rather it is conceived as a modification of something else; we have 'a white man', 'a white house', 'a white dog', etc. etc. But we don't have simply 'white'. 'White', then, is said to *imply* or connote the subject in which it is found; and it's impossible to conceive of 'white' without this implication. So, an absolute concept must not include in its comprehension a relation to another subject outside what it explicitly contained in that concept; but all accidents and attributes imply a subject of which they are accidents and attributes. Therefore, an absolute concept must be one which signifies something *after the manner of a substance enclosed in itself* (even if it isn't really a substance) and *not* after the manner of an accident, or attribute, or modification determining another. On the other hand, a connotative concept *does* signify something after the manner of a formality determining, modifying, and implying a subject besides itself, even if it really is a substance. 'Father' is conceived as a substantial thing in reality, nevertheless it isn't an absolute concept since it implies a relation to offspring. So every absolute concept must be conceived as a substance, but not everything conceived as a substance will be absolute. A 'teacher' is conceived as a substantial thing; we encounter teachers in reality. But it is an essentially connotative concept because it always implies a relationship to a student.

So, understand that a connotative concept always implies (or connotes) and has reference to something else—to something extrinsic or beyond what is immediately contained in the concept itself. In the case of non-essentially connotative concepts, there is always a relation to at least two things: 1) an abstract concept, and 2) a subject: 'white' implies 'whiteness' (which is an *abstract* concept) determining or modifying this or that subject. 'Blind' is a concept which implies 'blindness' affecting this or that seeing subject. So the connotative concept (e.g., blind), first and directly signifies its abstract concept (e.g., blindness) while secondly and indirectly signifying the subject to which it belongs (e.g., an animal which has lost its sight). 'White' signifies 'whiteness' as joined to something, not as standing by itself. So, the non-essentially connotative concept actually signifies two natures, though one is signified directly and clearly, while the other is signified indirectly and obscurely. The *essentially* connotative concept, on the other hand, does not always imply a relation to the abstract concept for the simple reason that an essentially connotative concept *can in fact BE* an abstract concept. 'Father', as a concrete concept, signifies directly 'fatherhood' (an abstract concept) and indirectly the man who is affected by a relation of paternity to some child. But 'fatherhood' itself is abstract, and it still implies a relation to offspring. So, the *essentially* connotative concept which is *also* a *concrete* concept will imply a reference to an abstract concept and to a subject, just as the non-essentially connotative concept—'father' implies 'fatherhood' as modifying or affecting this subject. But when it is conceived *precisely as an abstract* concept (e.g., fatherhood), the implication or connotation doesn't have reference to another abstract concept or to a subject determined by it; instead, it implies and has a relation to its correlative concept: e.g., 'fatherhood' implies 'childness', to give it a name. 'Nearness' implies 'farness'. 'Kingship' implies 'subjectship.' 'Highness' implies 'lowness', etc. 'Soccer-teamness' implies 'team-memberness'. If you didn't *implicitly* conceive of team members you couldn't conceive of a team because a team is a relation among members. 'Creation' necessarily implies a 'creator'—a relation to a creator must always be included in the comprehensive notes of 'creation'. 'Sculpture' necessarily implies a 'sculptor'.

Nothing in reality, it's true, is ever completely by itself. The mere fact of existence puts things in relation to each other, and so everything in that sense is relative. Even just 'being distinct' is a relation that one thing has to all other things. But that isn't to say that these relations are included in the *comprehension* of the thing as it is conceived or known by the intellect. Man might be, as a matter of fact (i.e., *de facto,* to give the technical term), the master of all animals, but the comprehension of man doesn't necessarily include this relation among its notes. Even if no other animals existed, even if we had no understanding of brutes at all, we could still conceive properly of man's nature. But this couldn't be if it had to include a relation to animals. So the fact that things happen to be in relation to other things is not enough to make concepts of them connotative. It might *suggest* a relation. We might arrive at a relation by the *association* of several concepts; but connotative means that there is a conceptual necessity of including this relation among the thing's comprehensive notes, so that the thing cannot properly be understood without this relation.

Finally, keep in mind what I said earlier: the process of defining will be a spelling out or enumeration of the various essential comprehensive notes of a thing. If, then, a thing cannot be defined without mentioning something else besides itself then it must contain a relation to another in its comprehensive notes; therefore, it will be connotative (e.g., higher cannot be defined except by referring in the definition to something else which it surpasses in height).

The Division of Complex Concepts

Just a few words about this. Complex concepts (e.g., learned white man) follow the same division as incomplex concepts. So, the complex concept can also be divided into concrete and abstract. But the abstract of learned white man wouldn't be 'learnedness whiteness humanity', because that would turn the complex concept into three incomplex concepts. Rather the abstract concept of learned white man would be more like 'learned-white-man-ness'; or to state the complex concept incomplexly, it would be 'scholarness'. Even though I've used the concept 'father' in a lot of the examples above, it is properly a complex concept: it is 'man' qualified by a relation of paternity. That is, it represents more than one nature in reality. It's abstract would be 'fatherhood'.

Complex concepts are likewise divided into absolute and connotative depending on whether any of the elements in the concept imply a subject not explicitly included among their comprehensive notes. So 'white man' is absolute because neither term implies another subject. You might ask, 'isn't white a connotative concept?' When white is taken as an incomplex concept, yes, it is connotative because it implies some subject which is white. However, here a subject which is white is not *implied* in the concept 'white man' but it is an essential note of the concept: the subject is man. Nothing else is connoted or implied. 'Annoyingly cheerful', on the other hand, is non-essentially connotative, because it implies some subject which *is* annoyingly cheerful. 'Annoying cheerfulness', then, would be the abstract and it would be an absolute concept. 'Father' would be an essentially connotative complex concept.

And what about something like 'golf ball'? This is a ball with a relation added to it; namely, the relation to the game of golf. Wouldn't it then be connotative, always implying the game of golf? No. Remember that the concept of a relation can include the *term* of the relation either implicitly or explicitly. If implicitly, then it is connotative since a connotative concept is one which implies something besides itself. But if the concept explicitly includes the *term* of the relation, then it doesn't connote or imply that term. 'Golf ball' includes the term of the relation: namely, the game of golf. For the same reason, 'sculptor of this statue' is not connotative, because it doesn't *imply* this statue, but rather it very clearly points out this statue. 'Sculptor', on the other hand, does not clearly give the term within the comprehension of the concept, but only implies it. 'Creator' is the same way—creator of what? There must be something which was created if we are to conceive of something as creator, but it isn't clearly and explicitly contained within the concept.

Three Cautions:

1) Be careful not to confuse absolute and abstract concepts. Not every abstract concept is an absolute concept (because essentially connotative concepts can be abstract), and not every absolute concept is an abstract concept. 'Man', for example is an absolute concept. It signifies a substance, not a modification of a substance. Yet, 'man' is not an abstract concept; it's a concrete concept. It signifies what a thing is (e.g., Peter is a man) and not that by which it is (e.g., humanity). But, 'whiteness', 'blindness', 'learnedness', etc., these are all abstract concepts (i.e., that by which something is white, blind, and learned) and they are also absolute concepts conceived as though they were substances.

2) Furthermore, don't confuse concrete and connotative concepts. Not every connotative concept is a concrete concept (because 'fatherhood' is connotative and abstract), and not every concrete concept is a connotative concept. 'Man' for example, is a concrete concept since it refers to 'what a thing is' and not 'by what' a thing is; but it doesn't imply a subject which it modifies (i.e., it isn't connotative) since it doesn't modify anything but, rather, it is a substance itself. 'White', on the other hand, or 'blind' are concrete concepts since they refer to what a thing is and not 'that by which' a thing is, but they are connotative since they imply a subject which they determine and modify.

3) And do not confuse the connotative concept with adjectives. Every adjective is connotative (e.g., black, bright, fast, large, happy, etc. each imply a subject which is black, bright, fast, large, or happy),but not everything which is connotative is an adjective. 'Father', for example, is grammatically a noun, but as a concept it is connotative; it implies an absolute concept (i.e., fatherhood) applied to some subject (i.e., to some man who has a child).

4) Finally, do not mistake a complex concept for an incomplex connotative concept. 'Scholar' does not imply or connote learning as something extrinsic to itself. Rather, learning is one of the very elements of 'Scholar': scholar is an incomplex term for the complex object 'learned man' or 'man with learning'.

To sum up: a **concrete concept** is one which represents some substance or an attribute known in a substance and considered precisely as a part of that substance's comprehension. An **abstract concept** is one which represents some attribute known in a thing yet considered *not as a part* of that thing's comprehension, but rather as a new thing with its own comprehension.

An **absolute concept** is one whose comprehensive notes do not include a relation to another subject. And because accidents (i.e., attributes or traits) always imply a relation to that of which they are accidents (i.e., a substance which they modify), absolute concepts must be conceived as substances (even if they aren't really substances). A **connotative concept** is one whose comprehensive notes include a relation to another implicit subject extrinsic to itself. Connotative concepts are of two kinds: non-essentially connotative concepts and essentially connotative concepts. **Non-essentially connotative concepts** include among their comprehensive notes a relation to another subject *only* when they are conceived concretely—not when they are conceived abstractly. **Essentially connotative concepts** are concepts of relations whose terms are not explicitly stated. They always include two or more subjects in their comprehension whether they are conceived concretely or abstractly.

EXERCISES: We don't normally pay much attention to these various kinds of concepts, but they are exceptionally important for reasoning. So, practice will be required to adequately identify and catalogue our ideas. Here are some examples:

1. **House – incomplex, concrete and absolute**

    a. House is the concept of a single artificial nature and therefore incomplex; it is a substance (though artificial) and not an attribute conceived as a substance, therefore it is concrete; I can conceive house without necessarily implying something extrinsic to the house, therefore it is absolute.

2. **Short – incomplex, concrete and connotative**

    a. Short is the concept of a single quality, therefore it is incomplex; it is considered as an attribute or note of some substance, not as a substance itself, therefore it is concrete; it implies a relation to 1) the abstract concept 'shortness' 2) a subject which is called short, and 3) something else which is tall, therefore it is connotative.

3. **Shortness – incomplex, abstract and connotative**

    a. Shortness represents a single quality, therefore it is incomplex; it is conceived as a thing in itself, though in reality it is not a thing in itself, therefore it is abstract; it no longer implies a relationship to something which is short, but it is still a concept of a relation and therefore implies a subject by which shortness is measured.

4. **Substance – incomplex, concrete and absolute**

    a. Substance only represents a single quiddity, therefore it is incomplex; it represents what in reality is really a thing and not simply conceived as a thing, therefore it is concrete; it represents in its comprehensive notes nothing else besides itself, therefore it is absolute.

5. **Substantiality – incomplex, abstract and absolute**

    a. Substantiality only represents a single quiddity, therefore it is incomplex; it represents the note 'substantial' as though it were a single thing, when in fact it is but a note of a thing (e.g., man is substantial), therefore it is abstract; it represents nothing in its comprehensive notes besides itself, therefore it is absolute.

6. **Classical – incomplex, concrete and connotative**

    a. Classical represents a single quality, therefore it is incomplex; it represents an attribute or note of something precisely as a note, and not as a separate thing, therefore it is concrete; it implies a subject which *is* classical, therefore it is connotative.

7. **Socialist – complex, concrete and absolute**

    a. Socialist represents the nature of man qualified by an adherence to socialism, therefore it is complex; a socialist is a substance with an attribute conceived as its part, not simply an attribute conceived as a substance, therefore it is concrete; it can be conceived without a relation to anything else, therefore it is absolute (it doesn't imply the doctrine of socialism as something extrinsic to itself, but it includes 'socialist doctrine' in its very self as the term of a relation, for a socialist is a man who adheres to socialism; on the other hand, if we were to conceive of 'man who adheres' without mentioning to what he adheres, the concept is connotative).

8. **Ball – incomplex, concrete and absolute**

    a. Ball represents something which is one nature in reality, therefore it is incomplex; it is a substantial thing, not just an attribute conceived as a substantial thing, therefore it is concrete; and it can be understood without implying a relation to anything outside itself, therefore it is absolute.

9. **Tennis Ball – complex, concrete and absolute**

    a. Tennis ball represents several natures, a ball and a relation to the game of tennis, therefore it is a complex concept; it represents a real thing with a real quality, not something merely conceived as a real thing, therefore it is concrete; it does not refer to

anything outside of itself (the game of tennis is not implied but included in the attribute of 'tennis', for a tennis ball is a ball used in the game of tennis).

10. **Near – incomplex, concrete and connotative**

    a. Near represents the nature of a single relation, therefore it is incomplex; it is represents an attribute of some object, and is not conceived as a thing in itself; it is connotative because it represents a relation and cannot be conceived without that which is near.

11. **Nearness – incomplex, abstract, connotative**

    a. Nearness represents a single relation, therefore it is incomplex; it conceives of it as some subject, when in reality it is only an attribute of some subject, therefore it is abstract; it is a concept of a relation, therefore it always connotes a relation to farness.

12. **Triangle (as object of mathematical inquiry) – incomplex, abstract, and absolute**

    a. Represents a single quantity, therefore it is incomplex; it represents as a substance what is really only the attribute of a substance, therefore it is abstract; its comprehensive notes include on relation to anything distinct from itself, therefore it is absolute.

13. **Triangular – incomplex, concrete and connotative**

    a. Represents a single quantity, therefore it is incomplex; it represents the attribute of something precisely as an attribute, therefore, it is concrete; it connotes or implies something which is triangular, therefore it is connotative.

14. **Triangularity – incomplex, abstract and absolute**

    a. Represents a single quantity, therefore it is incomplex; it represents the attribute of something as though it were a thing in itself, therefore it is abstract; its comprehensive notes include on relation to anything distinct from itself, therefore it is absolute.

Very tricky stuff! Keep in mind the definitions of these kinds of concepts and see if you can identify the following as complex or incomplex and concrete or abstract and absolute or connotative.

1. **Blue**
2. **Friend**
3. **Friendly**
4. **Friendship**
5. **Spiritual**
6. **Spirit**
7. **Red-head**
8. **Red-headedness**
9. **John**
10. **Good**
11. **Goodness**

12. **Creator**
13. **Living material substance**
14. **Organism**
15. **Happy**
16. **Policeman**
17. **A lump of gold**
18. **Intellect**
19. **Intellectual**
20. **An Italian man**
21. **Italian**

Division of the Concept by the Way it Signifies Extension

So, we've now divided the concept by the chief ways that it represents or signifies the comprehension and the comprehensive notes of things in reality. We've seen that when the concept signifies the comprehensive notes *as* comprehensive notes and *as parts* of the thing in reality, we have concrete concepts. When the concept signifies a comprehensive note not as a part of the comprehension but as a thing in itself and separated from the other notes, we have an abstract concept. We've also seen that when the concept signifies a comprehension which doesn't necessarily have a relation to another subject outside of itself, we have an absolute concept. When it signifies a comprehension which includes a note of relativity, or rather which implies a subject besides itself, we have connotative concepts. Now we are going to divide the concept by the way it represents or signifies, not the comprehensive notes and the comprehension, but the extension. We're going to look at the number of ways the concept can refer to extensive subjects—to the inferiors to which the concept can apply.

Singular and Universal Concepts

By reason of extension, a concept can signify one individual by itself, or several individuals. Hence, the concept is first divided into *singular* and *universal.* The singular (or particular or individual) concept represents an object which is in itself one and individual, and which therefore has no extension besides itself; that it, it cannot have any inferiors. 'This man' or 'this book' or 'Peter' or 'Gandalf' are all examples of singular concepts. A singular concept signifies one individual only; even as we conceive the singular thing, it does not signify something which can be communicated to or shared by several. The universal concept, on the other hand, applies to any multitude of inferiors which share in the common comprehensive notes. 'Man', 'book', 'literary figure' etc., are all examples of concepts which represent a nature common to many. Singular concepts are easily recognized by the addition of terms like 'this', or 'that'. Universal concepts are easily recognized by the addition of terms like 'all', 'every', 'each', and negative terms like 'none', 'no' (as in 'no men are stones'), 'not one' ('not one man is a stone'), etc.

Restricted and Non-Restricted Concepts

The singular concept cannot be divided any further by reason of extension. Why? Because it *has* no more extension—there's nothing else to be divided. The universal concept, on the other hand, can continue to be divided because it has an extension which can apply to any number of inferiors, real or imagined.

The universal concept is divided, first, into universal *restricted* concepts and universal *non-restricted* concepts, depending on whether the concept extends to all possible inferiors containing its comprehensive notes, or if it is limited only to a portion of those inferiors. The restricted concept represents only a portion of the possible extension of a concept. When I say 'some man' or 'a certain book', etc., I'm conceiving an object affected by a restriction to its extension; it doesn't apply to all possible men or all possible books. However, the idea of 'man' or 'book', 'every dog', etc., in general is not affected by this restriction and thus extends to all possible inferiors. The word 'some', then, makes restriction easily identifiable. Expressions such as 'some men', 'several men, 'a number of men', etc., all indicate a restricted concept. But note well that 'some' means, 'at least one'. In this way, a restricted concept is distinguished from a singular concept. A singular concept means 'this one and only this one and not possibly more than this one'. A singular concept, in other words, is entirely opposed to being in more than one, whereas a restricted concept is perfectly capable of being in several.

The restricted idea is of two types: *determinate* and *indeterminate.* A determinate concept is one whose signification extends only to an identifiable and definite part of all possible inferiors (because of other characteristics which are attached to the concept) and *excludes* the other inferiors. So when I say some men are black, I'm conceiving of some definite multitude which absolutely excludes the rest of the extension—some men are black and some men are not. My concept of 'some men' here refers to a determinate portion of the extension and not to any other. On the other hand, an indeterminate concept does *not* extend to any one identifiable and definite portion of an extension to the exclusion of the other

members. When I say 'some ship is needed in order to sail', I'm not referring to any definite ship; rather, any ship whatsoever will be needed in order to sail. We cannot say the same thing about the determinate concepts: we cannot say any man whatsoever is black. No, some men are black and the rest are not. 'Some men' in this case signifies certain *definite* members of the extension and it excludes all the others —'some men are black, some men are not black'. However, when I say 'some ship is needed in order to sail', I'm not saying 'some ship is needed and the rest are not'. I'm not excluding any ships.

Confusing determinate and indeterminate concepts will come back to haunt your reasoning processes. When I say, 'all roads lead someplace', I'm using 'someplace' as an indeterminate concept. So I can't rightly conclude from this, 'there is someplace where all roads lead.' In other words, just because all roads lead 'someplace' doesn't mean that all roads will eventually end in the same location. In the proposition 'all roads lead someplace', 'someplace' is indeterminate: any given place. While in the second proposition, 'there is someplace where all roads lead', 'someplace' is indeterminate: some one place. So a determinate concept is one which applies to some definite inferior (e.g., some man is running) while excluding others (some men are not running), while an indeterminate concept is one which may or may not be applied to some definite inferior (e.g., some eye is needed in order to see).

Non-restricted concepts are again of two types: *collective* and *distributive*. Both the collective and distributive signify many inferiors; they signify something which is common to many—since non-restricted concepts are universal—but there is a big difference between the two. When I think 'man' it is a concept that can be applied to each and every single man that I encounter. The notes which make up the comprehension of man really and truly exist within each instance of an individual man. Even if there was only one individual man in existence, the concept 'man' would still truly apply to him. However, if I think 'family' this concept cannot be applied to every individual that makes up a family. A family is made up of individuals. 'Man' is not made up of individuals. When I think 'family' the concept does not apply to each of the individuals taken singly. It does though apply to all of the individuals take as a whole. To use one of our earlier examples, if I think 'forest', my concept does not apply to every individual tree in the forest—it does 'distribute' to each tree taken singly. Rather, each individual tree is united under a common formality or intelligible notion. 'Forest' does not express comprehensive notes which exist in any individuals, but which exist only in a collection of individuals. You can't point to any particular tree and call it a forest. So a distributive concept is one whose signification extends to individuals taken separately and can be predicated (or said of) each of those individuals. Man can be predicated of each and every individual man; e.g., Peter is a man, Paul is a man, Aristotle is a man, etc. A collective concept is one whose signification extends only to a collection or group of individuals, and not the individuals themselves. Army, football team, family, forest, race, nation: all of these are collective concepts. General Patton does not fall within the extension of 'army' or else we would be able to say General Patton is an army. The U.S. Army, though, does fall within the extension of army, and the U.S. Army is made up of many individuals.

Collective concepts can also be themselves collective or distributive: 'battalion' is a collective concept in relation to 'soldier', and 'army' is a collection of battalions *and* of soldiers.

Univocal Concepts

The universal distributive concept is divided into two kinds: *univocal* and *analogous*. As I said, the distributive concept applies to each and every one of its inferiors individually. 'Man' applies to this man, that man, and every other man. Now, in the case of 'man', the concept is common to each individual for exactly the same reason: that is, each individual contains all the comprehensive notes which are found in the universal concept of 'man'. 'Animal' is said of 'man' and 'brute' for entirely the same reasons; namely, because both men and brutes are sentient, living, material substances—we call these concepts *univocal*

Analogous Concepts

Sometimes, however, the concept applies to each of the individuals in its extension not for the same reason but for different reasons. Healthy, for example, can be said of man, of food, and of color. But it isn't said of man, food, and color for exactly the same reasons. A man is said to be healthy because he possesses the quality of good bodily composition and functioning. Food is said to be healthy because it *causes* this good quality in man, not because it possesses health. Likewise, color is called healthy, not because color goes to the gym and eats well, but because a good complexion in man is a *sign* of good health. Health, then, is not applied to food and color for entirely the same reason as it is applied to man. Food and color fall into the extension of 'healthy' by *analogy.* Healthy is common to man, food, and color in diverse ways: for man as an intrinsic bodily quality, for food as a cause, and for color as a sign. 'Man', 'animal', 'book', etc. extend to their inferiors for the exact same reason—namely, because their inferiors properly possess the nature of 'man', 'animal', and 'book'. Concepts like healthy can also extend to inferiors which do not possess the quality of health, but because they are related to health in some way—we call these concepts *analogous*. Analogous concepts, then, represent objects which extend to certain things not because they share the same nature, but because they have a certain likeness or relation to that nature. An analogous concept is one which is said of several things according to a meaning which is partly the same and partly different in each case. When I say 'the eye sees' and 'the intellect sees', the concept 'see' is being applied to the intellect in an analogous sense. Only the eye properly speaking 'sees'; only it has visual knowledge. The concept 'sees' is here being used to indicate the proportion between a knowing power (such as the intellect and the eye) to the object known. So, as the eye has knowledge of its object (i.e., color) to the intellect has knowledge of its object (i.e., the intelligible quiddity of essence). And this relation of knowing power to its formal object is represented by the analogous concept 'see'.

There are broadly speaking two kinds of analogous concepts. There are some concepts which always and everywhere apply to each and every being in reality (but in slightly different ways)—and these concepts are called Transcendentals—and there are some concepts which apply to two or more beings, not because they share the same nature but because they have a certain similarity or likeness. The concepts which apply to every being in reality (i.e., the Transcendentals) are studied in Metaphysics, so we need only mention then here now. There are six of them: being, thing, something, one, true, and good. So, everything in reality can be called 'good', for example, though for different reasons. The will is called good when it is moral, the intellect is called good when it is in conformity with reality, plants are called good when they flourish as plants are supposed to, chemical elements are called good when they exert all the activities that they're supposed to, etc. So everything in reality is called good though for different reasons. Some concepts, however, are analogous, but they don't apply to every being in reality. 'Seeing', to use the above example, is an analogous concept which applies only to knowing things. Only the eye properly *sees* its object, but in an analogous sense the intellect can be said to 'see' its object, because as the eye is to color, so the intellect is to a quiddity or essence—eye:color=intellect:quiddity. And the concept of this proportionate relationship is an analogous concept that we call 'seeing'.

Intrinsically Analogous Concepts

Common analogy is of two types: *intrinsic analogy* and *extrinsic analogy*. A concept is intrinsically or essentially analogous when it always refers to a relation of proportion between two things. So, 'double' is an intrinsically analogous concept because it always refers to a proportionate relation between two quantities. The relation of 2 to 4 equals the relation of 6 to 12. That's not to say that 2 equals 6, and 4 equals twelve. That wouldn't be true. But they are equal according to an analogy of proportionality. The relation between those sets of numbers is the analogous concept of 'doubleness'; and there is an infinite combination of numbers that can fit this analogous concept. Doubleness, then, implicitly and of its very nature extends to every pair of numbers that can be related as 1:2. So, a concept of intrinsic analogy is one which represents an object that extends to many things because of a relation of proportionality that those things have with each other. 'Knowledge' is an intrinsically analogous concept. It refers to the proportion between a knowing power and the object known. The eye has knowledge of color, while the intellect has knowledge of a quiddity, and the tongue has knowledge of flavors, etc. The relation or proportion between these powers and their objects is an analogous concept we call knowledge—

sight:color :: hearing:sound :: taste:flavors :: human intellect:quiddity of things in physical reality :: Divine Intellect:God's own essence. The concept of 'knowledge' then is of its very nature analogous and extends to the relation between all the various knowing powers and their objects, even though all these power and objects are of different natures.

Extrinsically Analogous Concepts

A concept is extrinsically analogous, or *not-essentially* analogous, when it primarily signifies a univocal object but can be widened to include other things which are similar to itself. When I say 'the clouds are angry', 'angry' is a concept which essentially pertains to an emotion; angry is a connotative concept implying the animal which is experiencing the passion of anger. But by an analogy, I can say also that the clouds are angry. Not because they are experiencing an emotion, but because their behavior is erratic and frightens me just as an angry animal might. Hence, 'angry' only becomes analogous when it is compared to something outside itself yet similar to itself. And there are two types of this extrinsic analogy: *metaphor* and *attribution.*

Analogy of Metaphor (Metaphorical Concepts)

Metaphor is when we say that the clouds are angry. It is extending a concept to something outside of its proper and normal extension because of some accidental likeness or resemblance. We call the lion the king of the jungle, not because he alone has been vested with sovereign political authority, but because his strength and agility single him out as the strongest animal. The lion is equated with the king only because of some accidental likeness. Idiomatic expressions often contain metaphorical analogies such as when we say, "Perish the thought". Well, thoughts don't die: the expression is metaphorical. Again, if I say 'fatherland', we have a metaphor condensed into a single word.

Analogy of Attribution (Attributive Concepts)

Analogy of attribution, on the other hand, extends a concept to something outside its normal and proper extension because that other thing is somehow causally related to it: that is, because the thing to which it extends is either a cause or an effect of what the concept properly represents. Healthy, for example, primarily and properly extends only to those organic bodies that have harmonious bodily operation—when all its organic parts are doing what they're supposed to do. But because of the relationship that food and color have to being healthy, the concept of healthy can extend to them as well: to food as the cause of health, and to color as the sign of health.

A Note: Why We Haven't Mentioned Equivocal Concepts

In many works on Logic, you will see a division of concepts into univocal, analogous, and equivocal. For example, 'bark' can represent the noise that a dog makes, and the covering of a tree. 'Bark', then, refers to entirely separate things which don't have a metaphorical resemblance and don't have a causal connection—'bark' is neither univocal nor analogous, it is equivocal. So why haven't we included equivocal in our division? Because concepts cannot be equivocal, only words and terms can be equivocal. Words and terms are *signs* of our concepts; they represent our concepts. A word or term can be equivocal when the *same* term is used to represent two entirely different concepts. The concept of the noise a dog makes, and the concept of a tree's covering are different concepts; but we use the same word to signify both. Hence, it is the *word* that is equivocal because it represents two unrelated things; because it signifies two distinct concepts. Aristotle defines it as a common name signifying different natures. But the concept itself cannot be equivocal because each concept by definition signifies only one nature or quiddity (even if it *implies* or connotes another one). Therefore, the idea of an equivocal concept is contradictory. We will return to equivocity soon, when we discuss words and terms.

EXERCISES: Let's get some practice in dividing the concept by reason of extension.

Definitions – Go back through the text and find definitions for the following: singular concept, universal concept, restricted concept, non-restricted concept, determinate concept, indeterminate concept, collective concept, distributive concept, univocal concept, analogous concept, equivocal term, intrinsic analogy, extrinsic analogy, metaphor, analogy of attribution.

Practice concepts – say whether the following concepts are singular, universal, restricted, non-restricted, determinate, indeterminate, collective, distributive, univocal, or analogous.

1. **Philosopher**
2. **The author of the Summa Theologica**
3. **Some teachers (as in 'a new school needs some teachers before it can open')**
4. **Some scientists developed the nuclear bomb**
5. **Gandalf**
6. **Someplace (as in 'this door leads someplace')**
7. **Someplace (as in 'all doors leads someplace')**
8. **This book**
9. **Some one book (as in 'some one book, if it is bad enough, is all that is required to destroy a soul')**
10. **Every book (as in 'every book has pages')**
11. **No book (as in 'no books are living')**
12. **All books (as in 'all books are bound')**
13. **Parliament (or Congress, for the Americans)**
14. **Foot (conceived as an organic body part)**
15. **Foot of the mountain**
16. **A little bit of knowledge (as in 'a little bit of knowledge is a dangerous thing')**
17. **Some knowledge (as in 'some knowledge is sensitive, some is intellectual')**
18. **A pleasant color (as in 'the color of the room is pleasant'; remember 'color' in itself is only pleasing or unpleasing when it is brought into relation with an eye that sees it)**
19. **Football team**
20. **Triple (as in 2:6, and 4:12)**
21. **The man who founded Rome**
22. **Labor Union**
23. **No dogs (as in 'no dogs go to heaven')**

24. **Love (as in our love for others, God's love for us, the eye's love for seeing, the tongue's love for taste; in other words, a proportion between one thing which desires and another thing which is desired)**

25. **Laugh**

26. **A barrel of laughs**

27. **A great book (note that a book in itself is neither great nor poor, but only if it causes a kind of perfection in our minds)**

28. **Animal**

29. **'Bad', as in, 'A bad word' (note that 'words' themselves are indifferent; we call them bad when the cause a dangerous or tasteless concept within our own minds)**

30. **A few animals**

31. **Evil, as in 'An evil choice' (note that 'choice' in itself is not evil or moral; we call it evil when it is caused by a perverted will)**

32. **A number of men (as in 'a number of men are required to build a city')**

33. **City**

34. **Every animal**

35. **Moral, as in 'a moral choice' (same as 'an evil choice')**

Division of the Concept by Reason of Perfection

So far, we've divided the concept according to how it signifies the comprehensive notes of a quiddity, and how it signifies the extension of a quiddity. Now we are going to look at how well or poorly the concept can represent a quiddity. This is to divide to concept by reason of perfection. Remember, the concept is essentially a representation of the things in reality. Some representations are good and some are bad—a mirror image, for example, is a kind of representation of the things reflected, and it can be hazy or clear. So what we're looking at now is how *good* of a representation the concept can be; how *well* it makes known to us the things in reality.

By intellectual knowledge, we hope to attain a clear understanding of *what a thing is,* or rather an understanding of a thing's quiddity (i.e., its essence). We want to have knowledge of one determinate essence, and so the most perfect concept will tell us everything there is to know about what some determinate thing is. The most imperfect concept will be the opposite of this. The most imperfect concept will *not* give us knowledge of one determinate essence. It will not in any way tell us *what a thing is*, but only *what a thing IS NOT*. So by reason of perfection, the concept is first divided into *infinite* and *finite.*

The Infinite Concept

The purpose of the concept is to give us knowledge of a thing, and (as we've seen) we get knowledge of it by adding comprehensive notes and gradually limiting the concept's extension until it applies to this thing and to no other thing. This is to have knowledge of some one particular quiddity, and to separate this quiddity from all others. An infinite concept, however, does not allow us to do this. It doesn't give us notes which gradually limit the extension by telling us what a thing. It only gives us notes which tell us what a thing is not. 'Non-man' is an infinite concept. It applies to everything in reality, except man. If someone were to ask me, 'what is a quark?', and I respond, 'well, it's not a man', their knowledge of quarks hasn't been in any way perfected. There are still an infinite number of things that a quark could be. Even if I were to amend my response and say, 'well, it's not a man, it's not a dog, it's not a stone, etc.', I still haven't added to his concept any notes which explain what a quark is. An infinite concept, then, is one which does not give us any knowledge of one, determinate essence; an infinite concept is merely the negation of an essence.[22] The infinite concept is also sometimes called the indefinite concept: a perfect concept gives us knowledge of some definite thing, so the most imperfect concept gives us knowledge of no definite thing. Infinite concepts are easily recognized by the addition of 'non'; it simply removes or negates an intelligible note.

The Finite Concept

So the finite concept will at least tell us *something* about the essence, about what a thing is, even if it is only very vague. And so this finite concept will have varying degrees of perfection depending on just how much of the thing it reveals to us; depending on how many and what type of comprehensive notes its contains. Because of this, we divide finite concepts into common (or obscure) and proper (or clear).[23]

The Common Concept

Common concepts represent the essence only in their most common features so that one essence isn't clearly distinguished from other things. So, if I know 'dog' as only 'an animal', I do have real and determinate knowledge of the dog—I know it as a living thing with senses. I have a finite concept of its essence or quiddity, but I don't have *clear* knowledge of it. I don't know what things are *proper* to it; or rather, I don't know what notes pertain to the dog alone and don't pertain to anything else. I don't have any knowledge that distinguishes the dog from, say, a cat or even from man. Dogs, cats, and men are all

---

[22] In II Periherm., lect. 1

[23] In I Post. Anal., lect. 4, n. 4-5.

animals. So as long as I know a dog only as a kind of animal, I only have knowledge of its common attributes.

The most common concept, and therefore the most imperfect of finite concepts, is that of *being*. You'll hear a lot about the concept of being in your philosophical studies; it's the most important (and certainly the most debated) topic you'll find in Scholastic circles, and in it we discover the answer to modern idealism. But that's something for another course. Right now, understand that it's the most common concept that we can have. It applies to everything, real and possible. It even applies to God (though for different reasons, as you'll learn in Metaphysics). In the common concept of being, every other essence is contained obscurely and confusedly. Animal is a common concept in relation to brutes and man. Living is a common concept in relation to plants and animals. Being is a common concept in relation to absolutely everything; even things which will never exist in reality. A common concept, then, is one whose comprehension includes only those notes which the quiddity shares in common with other things.

The Proper Concept

So the common (or obscure) concept is one which represents an essence only according to notes which it shares with other things. It doesn't distinguish the quiddity from all other quiddities. The proper concept, on the other hand, does. The proper concept contains, not only common notes, but notes which apply to this quiddity and this quiddity alone; it contains notes which are *proper* to this essence. Rational is a proper concept of man because, as you'll learn in psychology, no other being is rational. A concept of man which includes this note allows you to distinguish man from all other things. And so a proper concept is more perfect than a common concept because it gives you more determined knowledge of what this particular thing is; not only knowledge of what this thing has in common with other things (common concept); and not only knowledge of what this thing is *not* (infinite concept).

But not all proper concepts are of equal value. Sometimes the proper notes contained in the comprehension are *essential* to the thing known, and sometimes the notes are *not essential*; i.e., sometimes they are accidental. For example, conceiving of man as a 'featherless bipedal animal' may in fact be a proper concept if there are no other featherless bipedal animals; if being 'featherless', 'bipedal', and 'animal' is not common to other things besides man. But these attributes are not essential to man; they don't pertain to his quiddity or essence. If an attribute is essential to a thing, then that attribute cannot be removed without destroying the thing itself—in other words, it always and everywhere pertains to the thing, and it is impossible for the thing to be without it. Now, bipedal is not essential to man because you can cut off a man's legs and he will still exist. Featherless is not essential because even if man suddenly sprouted wings he wouldn't cease to be man; genetic engineering will likely prove that point (albeit immorally). 'Rational', on the other hand, is not only proper to man, but it is essential to him as well, as you'll learn in psychology. So some proper concepts give us knowledge of a thing which distinguishes it from all others, but nevertheless it doesn't give us essential (or 'quidditative') knowledge of the thing. And since the goal of intellectual knowledge is to know the essence of something, a concept which contains only non-essential notes is less perfect than a concept which contains also essential notes. Because of this, proper concepts can be divided into *quidditative or distinct* concepts and *non-quidditative or confused* concepts.

Quidditative or Distinct Proper Concepts

So a quidditative concept is one which clearly identifies the essential notes of a thing. To know man as a 'rational animal' is to know what pertains to him essentially. To know a triangle as a 'three-sided plane figure', is to have essential or quidditative knowledge of it. A quidditative concept is one which contains proper and essential notes within its comprehension and, thus, distinguishes the thing known from all other things by what pertains to its very essence. However, there are always several essential notes in a thing, not just one. And we can have knowledge of all those notes, or only of a few. Therefore, quidditative concepts can be divided into *complete* and *incomplete*.

Complete Quidditative Concepts

When a quidditative concept is complete, it contains within its comprehension every essential note of a thing. Within a complete quidditative concept we can distinguish each and every essential intelligible object and lay them out one by one. When I have a complete quidditative concept of man, for example, my concept will contain all the notes of substance, corporeal, living, sentient, and rational. There may be many other notes besides these—such as 'generally being born with two legs', 'usually having hair', etc. —but as we'll learn later on, no other notes besides the ones given pertain to the very essence of man. Complete quidditative concepts are of two types: simply quidditative or positive-negative.

Simply Quidditative Concepts

Now, it is indeed logically possible that we can have complete quidditative knowledge of some things; we can know all the essential notes of a triangle, for example, and we can positively state all these notes by giving a definition of triangle. When we do in fact conceive of a thing as containing all these essential predicates, or notes, then we have strictly and simply quidditative concept. And we can do this in two ways: 1) by simply apprehending each of the notes or, 2) by not only apprehending those notes but also by understanding those notes perfectly.[24] In the case of '1' we have merely apprehensive knowledge; in the case of '2' we have comprehensive knowledge or *understanding* in the proper sense. So we can say to ourselves that man is substance, material, living, sentient, and rational and in this case we have only apprehensive knowledge; or in addition to stating that man is substance, material, living, sentient, and rational we can comprehend or *understand* what is means to be substance, material, living, sentient, and rational. Only when we understand all the notes—and not merely apprehend them—do we have truly perfect knowledge of a thing. To give another example, I can know (or apprehend) that a triangle is a 'three-sided plane figure', but unless I comprehend what 'plane figure' means then my quidditative concept is still imperfect. It is only when I apprehend all the essential notes AND entirely understand what all those notes mean that my knowledge of a thing is perfect. In other words, the comprehensive, simply and completely quidditative proper concept is the most perfect kind we can have.

Not Simply Quidditative Concepts, or Positivo-Negative Concepts

However, the quiddity of *some* things cannot ever be known perfectly by our limited human intelligence.[25] You see, all our knowledge is derived from material things—our intellectual knowledge comes first from the senses. To arrive at a knowledge of, say, immaterial things, we have to *negate* certain attributes that we discover in the material world. So, for example, in addition to all the positive attributes that we can say about God (e.g., He is Good, True, One, Living, etc.) we have to add negations that will remove the imperfections that we discover in reality: God is Living, but it is an inorganic kind of life; God is One, but not in the sense of an extended, physical unit; God is good but not in the sense that a cinnamon bun is good, etc.[26] Though the concepts of immaterial things might be quidditative (because they give essential notes), they also include negations among the comprehension notes. So we call these positivo-negative concepts: some of the notes represent the thing *positively* according to what it is in itself, while some of the notes are negations (i.e., infinite concepts—see above), which tell us only what the thing is not. Hence, these concepts are not strictly quidditative since a part of the comprehension doesn't tell us what a thing is, but only what the thing isn't. For that reason, our knowledge of immaterial realities can never be perfect: some of the notes in their comprehensions will always be—for us—negations.[27]

Incomplete Quidditative Concepts

---

[24] I, q. 12, a. 7, c.

[25] I, q. 85, a. 3, c.

[26] I, q. 13, a. 1, ad 2 et 3

[27] I, q. 12, a. 7, ad 2

So we've seen that *complete* quidditative (or distinct) concepts can be simply quidditative or positivo-negative, and apprehensive only or apprehensive *and* comprehensive. Now, the *incomplete* quidditative concept is very similar, except that it doesn't contain *every* essential or quidditative note. The incomplete quidditative concept is one which contains at least one essential note of a thing, but not every essential note. So it is a concept which is distinct as regards one part of the comprehension, but confused as regards another part. If I know man as a 'rational animal', but I don't know how an animal is different from a plant, then my knowledge is distinct in one way and confused in another. It's distinct as regards the note which separates man from the other animals (i.e., rational), but its confused because it doesn't know what essentially separates animals from plants. This concept is obviously less perfect than a complete quidditative concept which knows *each and every* essential part. Incomplete quidditative concepts can be divided exactly as complete quidditative concepts; i.e., into simply quidditative and positivo-negative, into apprehensive only and apprehensive/comprehensive.

Non-Quidditative or Confused Proper Concepts

Okay, so I mentioned that some proper concepts contain notes which essentially (i.e., always and everywhere) pertain to the thing under consideration—and I called these quidditative—while some proper concepts contain notes which are not essential to the thing. These are called non-quidditative or confused concepts (they are called 'confused' because they do not allow us to tell apart the essential from non-essential notes of the thing—the essential and non-essential notes are confounded or confused with one another). It is still a proper concept, as I said. It still distinguishes this thing from all other things, but it does this according to notes which are accidental or non-essential. Again, to conceive of 'rational animal' is distinguish man from other beings according to his essential notes, while to conceive of 'featherless bipedal animal' is to distinguish man according to non-essential notes. And this non-quidditative understanding can happen in two ways: 1) by understanding the non-essential attributes, traits or accidents of a thing; 2) by understanding the extrinsic causes of the thing.

Confused Concepts through Accidents

Being 'featherless' and being 'bipedal' are not essential to man, as I've pointed out above. But they are intrinsic attributes or accidents of a human. Generally speaking, a man has two legs; generally speaking, a man does not have feathers. When we know 'man' in this way, we do not have knowledge of his essence properly speaking; we don't know what makes him a man. Knowing man through sensible characteristics alone is very imperfect knowledge. Nevertheless, these characteristics can very often allow us to identify a man and distinguish him from all other creatures. Taken separately, 'being featherless', 'being bipedal', and 'being an animal', might apply to any number of things: rocks are 'featherless', birds are 'bipedal'. But when we join these attributes together and get something like 'featherless, bipedal animal between certain heights and possessing certain bone structures with a certain kinds of skin tones and textures, etc. etc.' we can easily point out a man; we can sensibly identify a man when he is compared with, say, a fire hydrant. Having all these attributes at the same time may, as a matter of fact, pertain only to man. Nevertheless, it only serves to point out a man—not to tell us what a man is essentially. When someone asks me, 'what's a widge-a-ma-hicky?' I might point to something in the corner of the room and say, 'that's a widge-a-ma-hicky.' The person would then form a concept of 'widge-a-ma-hicky' with all the sensible characteristics the he has observed in the thing in the corner. Perhaps he can easily identify a widge-a-ma-hicky from now on because he knows what it looks like. Yet, he still hasn't the foggiest idea what a widge-a-ma-hicky really is; he doesn't know its quiddity because he can't separate the essential or quidditative notes from the non-quidditative. His concept is very confused. Maybe he'll investigate that thing in the corner a little more, and maybe he'll discover that it is of a definite length with definite color and definite chemical construction. But that still won't tell him anything about the essence of a widge-a-ma-hicky unless he can say 'this thing *must* be of such-and-such a length with such-and-such color and such-and-such chemical construction or else it would cease to be a widge-a-ma-hicky.' Until he understands what essentially pertains to the nature of a widge-a-ma-hicky he has only confused knowledge. Perhaps what he sees in the corner is made of plastic, and perhaps his concept of widge-a-ma-hicky might contain the note of 'plastic'. But who's to say that a

widge-a-ma-hicky can't be made out of metal? Until he knows that a widge-a-ma-hicky must be plastic in order for it to be a widge-a-ma-hicky, he doesn't have quidditative or essential knowledge; he cannot yet say that 'being made of plastic' is essential to 'being a widge-a-ma-hicky'.

As an aside, ask yourself about the question of evolution. Now, whether or not evolution actually occurred has nothing to do with the point I'm about to make. Ask yourself about the arguments put forward on behalf of evolution. Evolutionists generally argue that early hominid skeletons prove that man evolved because of the structural similarity to human skeletons; i.e., their bones and bone-properties look alike. Now, ask yourself, is their concept of 'man' distinct or confused? We will return to this point later on (in Material Logic) when we discuss how to *prove* that something is essential or non-essential. But for now just consider whether bone stature is an essential note that will allow us to identify or equate two different species. Obviously, if two things possess the same *essential* notes then they will be of the same essence. Thinking ahead to what we'll learn later, do you think that bone structure is one of those essential notes? Or are many evolutionists mistaking a non-quidditative concept of man for a quidditative concept.

Confused Concepts through Extrinsic Causes

In addition to the non-essential (i.e., accidental) traits and attributes of a thing, we can also have a non-quidditative knowledge through extrinsic causes. Think back to the beginning of the course when we briefly discussed the four causes: material, formal, efficient, and final. The extrinsic causes are efficient and final, as I said, because they are separate from the thing caused. The sculptor (the efficient cause) is distinct from the statue; the money for which the sculptor sculpted (the final cause) is also distinct from the stature—the efficient and final causes are extrinsic to the statue. But we can have a concept of the statue which includes the efficient and final causes. If I conceive of statue as 'that which was created by Michelangelo', I have a non-quidditative concept through the efficient cause. I don't know much about the nature of the statue; I don't even know what it is made of. In fact, I don't even know that it is a statue —it could be a painting. I can also conceive of statue as 'that which is created for money'. This is through the final cause. And again it doesn't tell us very much about what a statue is because lots of things are made for money. Again, I can even combine the two extrinsic causes and get 'that which was created by Michelangelo for money'. A little better now because our concept excludes things which are done for other motives and by other people. But still we have no essential, intrinsic knowledge of what a statue is.

Furthermore, I can combine notes of extrinsic causes with notes of accidents. For example, when I conceive of statue of 'that which is made from marble by Michelangelo for the purpose of making money'. This is better still; nevertheless, it is still not quidditative. Can't we have statues made out of clay? Can't we make statues for other motives than money? Can't other people make statues? This knowledge is all non-essential, non-quidditative. It's very imperfect. To make it perfect we need to discover which of those notes always and everywhere pertain to a statue such that a statue would be destroyed if ever those notes were removed.

Division of the Concept by Reason of Origin

We've looked at the various ways that the concept represents the comprehensive notes of a thing (division by reason of comprehension), we've looked at the various ways that the concept represents the extensive inferiors (division by reason of extension), and we've looked at the various levels of perfection that a concept can have (division by reason of perfection). Now, we're going to study the order in which ideas are caused in our intellects. You see, not all concepts occur to us in the same way. Some concepts we abstract immediately from the world of sense, for example, while other concepts are caused in our mind by means of previous concepts. So my concept of 'dog' is originally abstracted from the several dogs I've encountered with my senses, while my concept of God is never abstracted from sensible particulars. Again, my ideas of certain kinds of rocks are developed from the various sense properties that I encounter in the geological world; I know 'gold' first because of the yellow color, the durability, etc. But my concept of 'subatomic particle' is a concept arrived at by means of reasoning from sensible effects, back to their causes: I never immediately sense subatomic particles, rather I reason to them from the things that I do sense. These are just a few examples of how concepts are caused in our minds. Let's now lay out the full division.

By Mediation

A concept can be caused in us either by sense knowledge alone or else by means of a previous concept. Hence, we divide concepts into immediate concepts and mediate concepts.

Immediate Concepts

In the natural process of development, our intellects first started out completely blank. We had no concepts because we originally had no sense experience from which to derive our concepts. A new born likely has almost no intellectual activity (though this is far from saying he has no intellect!). He knows only a changing sensible reality; a world in constant motion. By gradually repeating his experiences of this world and developing his memory, he begins to recognize a certain stability in the midst of all this change: some things stay the same. A 'being' (the most common concept, as we said in the last chapter), some certain bundle of sensible qualities, for example, always greets him in the morning. This bundle has a certain color, and size, and odor, and sound. And whenever this bundle of qualities is around the same sound is repeated; namely, a vocalization that we call 'dog'. This being is now recognized as some definite nature that the child will associate with and refer to as 'dog'. He has abstracted the concept of 'dog' from this abiding, stable bundle of sensible qualities. He is, of course, a long way from perfectly understanding what a dog is. Nevertheless, he has a common, finite concept of dog. This was not formed by means of previous concepts; in fact, it's possible that the child had no previous concepts to draw from. It was abstracted immediately from his sensible experience. Hence, we call it an immediate concept.

Mediate Concepts

Now, once we have a storehouse of concepts that were immediately derived from sense experience we can move to an understanding of other things which we have *not* immediately sensed. For example, none of us have ever met a dodo because they don't exist anymore. How then can we form an idea of it? Try explaining to someone what a dodo is. You might start by asking that someone if they know what it means to be extinct. They answer yes. Then ask them to conceive of a bird. No problem. Now, join the two concepts together and you get 'an extinct bird'. They now conceive of a dodo as an extinct bird. Granted, this is a very imperfect concept—it's certainly not quidditative because 'being extinct' is not of the essence of dodo birds—but they have a concept nonetheless, and it has been caused in them by joining previous concepts. In other words, it is a single new concept caused by the mediation of other concepts.

There are different kinds of mediate concepts; not all are exactly like the example of the dodo. When, for example, I intellectually conceive of a statue of Aristotle, my concept is what we call *actually or objectively mediate*. The statue is the object of my thought; my concept is of 'statue of Aristotle'. But in this concept, the nature of Aristotle *himself* (not the nature of the statue) is represented. By means of my

concept of the statue, I am conceiving of the nature of Aristotle himself. Likewise, when someone points to a picture of Aquinas and says 'that man', our concept immediately refers to the picture and by means of the picture to Aquinas himself. Again, in thinking about the reflection of a man in a mirror I am conceiving the nature of man but as contained in the mirror; the mirror is properly the object of my thought and the nature of mean is known through the mirror. We call this objectively mediate because the object of my thought is one thing (e.g., the statue or the mirror image), but contained in that one object we find a concept of the thing represented (e.g., Aristotle or man). We are not forming a new concept in order to conceive of Aristotle or a man; rather, by means of one concept two things are known. That is, two objects are known in a single act of simple apprehension.

Now, some concepts are mediate in another way. When we form a *new* concept in a *new* act of simple apprehension but by the help and mediation of previously known concepts, we have what is called a *virtually or formally mediate* concept. We can know 'extinction' by one act of simple apprehension, and we can know 'bird' by another. Bird and extinction are known separately, but they have the power (power=*virtus* in Latin, from which we get 'virtually') to be joined together so that a new concept is formed, i.e., extinct bird. 'Extinct bird', then, is known by a new act of simple apprehension, but it is composed entirely of previously known concepts. So, the difference between a virtually/formally mediate concept and an actually/objectively mediate concept has to do with how many acts of simple apprehension are required to conceive the mediate thing. If there is only one act of simple apprehension such that what is conceived mediately is known *in* the primary concept, then we have an actually/objectively mediate concept. So when I conceive of a man's reflection in a mirror I'm primarily conceiving a physical phenomenon of light rebounding off a surface, but by means of this (and in one and the same act of apprehension) I'm also conceiving of the nature of man. However, if the mediate concept is derived from a second act of simple apprehension, then it is virtually/formally mediate. So, when I think 'plain figure', and then I join it to the concept 'three-sided', the concept of triangle is formed in my mind by an act of apprehension different from those by which I conceived of 'plain figure' and 'three sided'.[28]

Immediate concepts are primarily the concern of Psychology; studying how we first abstract these notions and how they develop by interaction with the senses. Logic is concerned mainly with mediate concepts. This is because Logic is primarily concerned with *reasoning* and the syllogism. Well, the syllogism works by joining concepts together to make a conclusion. Hence, the conclusion will always be mediate.

By Presence

A concept can either depend upon the physical presence of its object in order to be conceived or not depend on the physical presence of its object. For example, we can conceive of a chiliagon (i.e., a thousand-sided plane figure) without having a chiliagon sitting in front of us. We can conceive of 'nearness' without ever sensing it, because 'nearness' is not something that you can sense. On the other hand, we cannot conceive of 'this book' or 'that man' without the book or man being present to the senses. Because of this, concepts can be divided into intuitive and non-intuitive (sometimes called abstractive).

Intuitive Concepts

Intuitive concepts are ones which require the real physical sensation of the thing known. To understand this, think back to our discussion of sense knowledge versus intellectual knowledge. We said that the senses know singular things while the intellect knows universals. So, if we are to understand singular things—i.e., if we are to have intellectual knowledge of singular things—we will have to coordinate both

[28] Connotative concepts give us a great source of *objectively* mediate concepts. Remember, a connotative concept is one which implies a relation to something besides itself. The concept of strong implies a relation to a subject which *is* strong; which is *possesses* strength. By reflecting on the concept 'strong' we see that there must be some subject which is implied in this single concept of 'strong'. Granted, whatever the subject is might be indeterminate, but nevertheless that indeterminate 'something' is always *actually* contained in the concept.

our senses and our intellect. In order to conceive of 'this book', I must conceive the nature of book and sense a particular object in which the nature of book has existence. That is, in order to conceive of 'this book' there must be a real book which corresponds to the concept 'book'; some book must be present to my senses because the concept 'this book' is a singular concept, while the intellect only directly knows universal things. 'This book', 'this man', 'this glass of wine', 'Peter', 'Mary', and any other singular concept will need to involve the senses. However, as you'll learn in Psychology there are two kinds of senses, external and internal. You can undoubtedly name the external senses just as Aristotle did: sight, hearing, taste, smell, touch. But did you know that there are also four internal senses? These are the imagination, the common sense, the cogitative sense, and the memory. So, there are external AND internal senses. And, therefore, an object can be sensibly present in two ways: either present to the external senses, or present to the internal senses. The image of a dodo bird that I have in my head is sensibly present to the imagination: I can image the dodo to be a certain size and of a certain color and having a certain plumage. I can even give my imaginary dodo bird a name. We'll call him Barsanuphius. Now, just as my singular concept of 'this book', so my singular concept of 'Barsanuphius' will require the sensible presence of the dodo; however, dodos are extinct and hence cannot be present to the external senses. But they can be imagined. I have in my imagination a singular thing that I call Barsanuphius, and that is sufficient to conceive of him in the intellect. Likewise, I can have the singular concept of 'Peter' when Peter is standing in front of me, but I can also retain the sensation of Peter in my imagination when Peter is nowhere to be found. That is, I have a sensible thing in my imagination that will allow me to intellectually conceive of Peter even when Peter is absent. An intuitive concept, then, is one which requires the presence of a sensible singular; present either to the external senses, or to the internal senses. An intuitive concept is always caused by the sensible presence of its object.

Non-Intuitive Concepts

Non-Intuitive concepts are ones which do not require the sensible presence of the object known; neither in the external senses nor in the internal senses. They do not need to be caused by the sensible presence of that object. Universal concepts are of this sort. When I conceive the nature of 'man' I don't need to be sensing any particular individual man. I'm simply apprehending man in the universal independently of any of my senses. Likewise, 'dodo' is a non-intuitive concept. It isn't caused by the sensation of a dodo bird. Quite the opposite. In the case of the dodo bird, it's caused by joining two concepts together (i.e., the concepts of extinct and bird) and then the image in my imagination follows as a consequence; the phantasm of *Barsanuphius* follows my concept of 'dodo'.

All experimentation deals with intuitive concepts, because experimentation is the cataloguing of singular events. But I don't just mean laboratory experimentation: when a toddler experiments with his toys, he is dealing with concepts of singular events. Experimental knowledge is intellectual knowledge of sense objects which are in motion, or rather sense objects which are changing. We'll learn later on that properly scientific knowledge must be *non-intuitive*, and that intuitive knowledge is only a preparation for scientific knowledge. So we will return to this division—especially when we reach and *induction* and the dialectical syllogism.

By Directness

Our intellect primarily and directly knows the things in the material world. But we can also turn our intellect back on itself and indirectly understand our own understanding. Because of this concepts are divided into direct and reflex.

Direct Concepts

The direct object of the eye is color. The direct object of the ear is sound. And as you'll learn in Psychology, the direct object of our intellects in this life is the quiddity of material things. A direct concept then will be a concept of some material thing—the concepts of 'book', 'man', 'dog', 'color', 'quantity', etc. are all direct concepts—or of something which is known by analogy with material things —i.e., concepts of the immaterial. They bear directly on the proper object of the human intellect.

Reflex (indirect) Concepts

But the intellect can do something that the eye and the ear cannot. It can turn its knowledge back on itself. The eye cannot see 'sight'. The ear cannot hear 'hearing'. This is because the eye and the ear are extended material things and cannot 'bend back' on themselves. But the intellect is not extended— it's immaterial. Hence, it can bend back upon itself and make its own operation an object of intellectual knowledge. That is, the human intellect can understand 'understanding'. The reflex concept, then, is one by which we know our own intellection, our concepts, and even our soul itself. It is a concept by which we know that we know; it is a concept of a concept and it connotes (think back to the division by reason of comprehension) or implies the principles of that concept: namely, the intellect itself and even the soul. So, reflex concepts are also actually/objectively mediate concepts. They are discovered by reflecting on our direct concepts. Exactly how this takes place will depend upon Psychology to prove. For the logician, we need only recognize that there is a distinction between knowing an object outside our concept without reflecting on our knowledge, and knowing our knowledge itself.

The Divisions of the Concept Considered Relatively

So far, we've been dividing the concept in itself and absolutely. That is, we've only been concerned with single concepts by themselves. We've examined a large number of logical properties (i.e., second intentions) that accrue to things as they exist in the mind. We've seen that 'man' in reality only exists in singulars, but in the intellect he is simple and concrete and universal and distributive and univocal, etc. and that he can be finite and quidditative and complete, etc. 'To be concrete', 'to be universal', 'to be quidditative' etc., these are all logical properties that attach to the single concept of 'man'. But there are also logical properties which attach to concepts when they are put *in relation* to one another. In the physical world (independently of the mind), two men placed in relation to each other might take on the roles of, say, employer and employee, or customer and salesman. In the *logical* world, two concepts might take on the roles of identity or diversity, for example. So what we are going to do now is look at these various logical properties which exist between concepts. That is, we are going to divide the concept relatively; we'll see the different relations that one concept can have to another. And we can compare concepts in two ways: 1) by reason of sameness and difference, when by comparing the two concepts we discover one to be the same as the other or not; 2) by reason of inclusion and exclusion, when by comparing two concepts we discover that one always includes the other or excludes the other or is indifferent to the other.

Division of Several Concepts by Reason of Sameness and Difference

Some concepts, when compared to each other, are found to be *identical* and others are found to be *diverse.*

Identical Concepts

Identical concepts are those which signify or represent the same thing. But remember that concepts represent a thing both comprehensively *and* extensively. So two concepts can be identical or diverse in relation to both comprehension and extension or in relation to extension only. When I conceive of 'man' and 'rational animal' I have two concepts which share the same comprehension, and consequently the same extension. But when I conceive of 'rational animal' and 'featherless bipedal animal' there is only an identity of extension. That is, each concept has diverse comprehensive notes, but nevertheless they extend to the same number of inferiors. Again, when I conceive of 2^4 and 4^2, I have concepts which are comprehensively diverse, but extensively identical; i.e., they are concepts containing different comprehensive elements but they have the same number of extensive inferiors.

Concepts which are identical in both comprehension and extension are called *strictly* identical. While concepts which are identical only in extension and not in comprehension are called *equipollently* identical. It's not possible to have concepts which are identical in comprehension but not identical in extension, because comprehension is logically prior to extension, as was explained some time ago—extension depends upon and is determined by comprehension.

Diverse concepts

So, diverse concepts are simply concepts which have different comprehensive notes and different extensive subjects. In other words, they are concepts which represent or signify different things. The concepts of fire hydrant and computer are diverse in both comprehension and extension.

Division of Several Concepts by Reason of Inclusion and Exclusion

Some concepts include one another or exclude one another, while some concepts are wholly indifferent to one another; i.e., they neither include nor exclude the other. The former are called pertinent concepts while the latter are called impertinent concepts.

Impertinent Concepts

When I think 'black' and 'dog', I have two concepts which neither include nor exclude the other. That is, I can think of 'dog' without thinking of 'black' and vice versa. But sometimes one concept *does* include another: the concept of 'man' includes the concept of 'animal'. That is, I can't think of a man without implicitly thinking of an animal, though I can certainly think of a man without thinking of a black man or a white man. Concepts which are connected, concepts which have a relation of inclusion or exclusion to one another are called pertinent concepts (from the Latin, 'pertinare' meaning 'to pertain to'); while concepts which neither include nor exclude one another are called impertinent concepts. 'Dog' and 'black' are impertinent concepts. Dogs neither include nor exclude blackness; rather, they are indifferent to being black or white or any other color. White and sweet neither include nor exclude each other: some sweet things may be white but, then again, maybe not. Learned and prudent are the same: some men may be learned and prudent, some may be one or the other, some may be neither.

Pertinent Concepts

Pertinent concepts, however, are not indifferent to one another; they either include each other or they exclude each other. And because of this they are divided into two kinds: pertinent of *sequel* (those which *include* one another), and pertinent of repugnance (those which *exclude* one another).

Pertinent of Sequel

Concepts are pertinent of sequel when they include each other or follow upon each other; that is, concepts are pertinent of sequel when one concept *infers* the other. When I conceive of man, I'm conceiving of an animal. Hence, animal follows upon the concept of man, at least implicitly. Animal falls within the comprehension of man.

'Three sided plane figure' and 'having three interior angles equal to 180 degrees' are also concepts which always entail one another; they are pertinent of sequel because everything which is a three sided plane figure has three interior angles equal to 180 degrees as a necessary property. However, there is a big difference between conceiving these two things and conceiving 'man' and 'animal'. 'Three sided plane figure' and 'having three interior angles equal to 180 degrees' mutually infer one another; where there is a three sided plane figure, there are three interior angles equal to 180 degrees, and vice versa. We call these concepts *mutual or convertible* because each one infers the other and they are interchangeable (i.e., convertible) in regards to extension. 'Man' and 'animal', on the other hand, do not mutually infer. That is, while the concept of man always implicitly includes the concept of animal (because every man is an animal), the concept of animal does not always include the concept of man (because not all animals are men). Hence, we call 'man' and 'animal' *inconvertibly* pertinent of sequel. Man infers animal, but animal does not infer man.

As an interesting etymological aside, do you recall when we discussed comprehension and extension we said that the extensive subjects were called 'inferiors'? That is because they *infer* the comprehensive notes; i.e., they are inconvertible pertinent of sequels. So, brutes and men are the inferiors of animal—they *infer* the concept of animal. You might speak of them, not as inferiors, but as *infer-ers,* while the concepts which are inferred are called superiors.

Pertinent of Repugnance

Concepts which pertain to each other because of repugnance are concepts which exclude one another. That is, they cannot exist together in the same object. Smart and stupid, black and white, blindness and sight, tall and short. These are all concepts which cannot apply to the same thing in the same way at the same time; they are concepts which signify or represent opposing natures or quiddities. For that reason, they are also called *opposites*. There are two kinds of opposition: proper opposition and improper opposition. Proper opposition refers to opposing attributes which can exist in a subject but not at the same time in the same way: smartness and stupidness, virtue and vice, etc. Improper opposition refers not

to opposing attributes of one subject, but rather to distinct subjects. 'Man' and 'stone' are improperly opposed because no man can be a stone. Yet, we don't say that stone is the opposite of man. Improperly opposed concepts are also called *disparate* concepts.

Proper opposition can be between one form or determination and the absence of that form, or proper opposition can be between two forms or determinations which cannot exist in the same subject at the same time. Hence, proper opposition is divide into negative opposition and positive opposition.

Negative opposition

Concepts are negatively opposed when one concept removes the form that the other one gives. So, blindness is the absence of sight. Blindness is not a thing in itself, but merely the non-existence of sight. This removal of a form can occur in two ways: by contradiction and by privation.

Contradiction

Concepts are contradictory when one concept is the negation of the other: man and non-man, being and non-being, white and non-white, smart and non-smart. Contradictory opposition is the kind of opposition between a thing and its negation. There is no middle ground between contradictory concepts: a thing is either a man or it is not.

Privation

Privative opposition is between a thing and some form or determination which that thing is capable of receiving. Blindness, as I pointed out, is not a thing in itself, but rather the lack of sight in a being which is apt to see. Darkness is the absence or privation of light in a subject capable of being illuminated. Ignorance is the lack of knowledge in a subject which should have it. Insincerity is the lack of sincerity in a subject capable of being sincere. The key to privation is that it is the lack of a form or determination in a subject apt (i.e., capable) to receive it. A stone is not 'blind'; rather, it is non-seeing. A stone is not ignorant, it is non-knowing. Hence, whereas contradiction has no middle ground—e.g., something is either a man or not a man—privation does have a middle ground—e.g., between seeing and blind, we have non-seeing; between knowledge and ignorance we have non-knowing (which is also called nescience). Privation occurs in a subject lacking a perfection which it is capable of receiving; but a stone is not capable of seeing, hence it isn't susceptible to blindness.

Positive Opposition

Concepts are positively opposed not when one concept simply removes the form given by the other concept, but when both concepts gives forms or perfections that cannot exist at the same time. That happens in two ways: by contrariety and by relativity.

Contrariety

Contrary opposition occurs when two concepts represent positive perfections which mutually expel each other from the same subject: red and blue, virtue and vice, bitter and sweet. Sometimes these opposing concepts have a middle ground (and then we call them mediate contraries), but sometimes they do not have a middle ground (and then we call them immediate contraries). Between black and white there are many shades of grey; so, black and white are *mediate* contraries because they have middle ground. Between moral and immoral in a human act there is no middle ground; hence, they are *immediate* contraries. Between odd and even there is no middle ground; hence, they are immediate contraries.

Relativity

Finally, concepts can be opposed because they are correlative notions which imply each other but in *different* subjects. Higher implies lower, teacher implies student, father implies child, front implies back, offense implies defense, etc. Neither of the correlative terms negates or deprives the subject of

something; to be a father is not to lack something, nor is to be offspring to lack some perfection. Rather, each term gives a perfection which cannot exist at the same time, in the same way, and in the same subject as the perfection given by the other concept.

So according to this fourfold opposition, opposed concepts are distinguished into contradictory opposites, privative opposites, contrary opposites, and relative opposites.

EXERCISES:

1. **What is the difference between a mediate and an immediate concept?**
2. **Was your first concept mediate or immediate?**
3. **Is my concept of God mediate or immediate?**
4. **Why are concepts divided into intuitive and non-intuitive?**
5. **Is my concept of 'Rome' intuitive or non-intuitive?**
6. **How about my concept of 'city'?**
7. **And my concept of 'man'?**
8. **What in my concept of 'this book' pertains to the intellect and what pertains to the senses?**
9. **Is Gandalf non-intuitive because he doesn't exist?**
10. **What is the difference between a reflex concept and a direct concept?**
11. **Is my concept of Gandalf direct or reflex?**
12. **How about my concept of God?**
13. **And my concept of this man?**
14. **What about my concept of 'idea'?**
15. **What about my concept of 'sensation'?**
16. **And is my knowledge of 'my intellect' direct or reflex?**
17. **When are two concepts entirely diverse?**
18. **How can two concepts be partly identical and partly diverse?**
19. **My concepts of '7 + 3' and '20 – 10'; are they entirely diverse?**
20. **How about 'the shortest distance between two points' and 'length without breadth'?**
21. **What about 'line' and 'circle'?**
22. **When are two concepts strictly identical?**
23. **'Man' and 'human nature'; are they equipollent?**
24. **How about 'triangle' and 'three-sided plane figure'?**

25. Are the following pertinent or impertinent?

- **a. Man and substance**
- **b. Triangle and orange**
- **c. Triangle and line**
- **d. Triangle and plane figure**
- **e. Dog and cat**
- **f. Dog and fluffy**
- **g. Man and scholar**
- **h. Man and organism**
- **i. Man and Barsanuphius the Dodo**
- **j. Dodo and corporeal**

26. Are the following pertinent of sequel or pertinent of repugnance?

- **a. Baby and adult**
- **b. Man and adult**
- **c. Man and baby**
- **d. Triangle and man**
- **e. Barsanuphius and dodo**
- **f. Higher and lower**
- **g. Higher and non-higher**
- **h. Shaped and shapeless**

27. How are the following concepts opposed to each other?

- **a. Cubed and flat**
- **b. Darkness and light**
- **c. Healthy and sick**
- **d. Healthy and non-healthy**
- **e. Gaseous and liquefied**
- **f. Prudent and imprudent**
- **g. Teacher and student**
- **h. Full and empty**

i. **Yellow and white**

j. **Hearing and deaf**

k. **Solid and hole**

Signs of the Concept: Words or Terms

Up until now, we've been examining the product of simple apprehension: the concept. We've been looking at the concept because our task in Logic is to perfect reasoning, and reasoning happens by putting concepts together and taking them apart. In order to have the best processes of reasoning, we must have the right kinds of concepts.

Now, man is a not a solitary creature. He is born into a society (i.e., the family) and he naturally tends to create civil societies (i.e., the state). But society would be impossible without some sort of communication between its members. Men do not instinctively perform designated roles in society, but they have to discuss and determine who should do what. And unless they interact, society would never tend toward a common goal; everyone would go his own way. So there had to be some way to communicate our thoughts to others. To do this, mankind invented various signs that represent our intellectual operations of simple apprehension, judgment, and reasoning. That is, to make known to others what is taking place on the intellectual level, we invented language; we associated different thoughts with different sounds, and then we associated different sounds with different graphical symbols so that whenever these symbols were repeated, a particular thought or concept would be recalled in the mind. Language, then, is the sign of intellectual knowledge.[29]

"Now, if man were by nature a solitary animal the passions of the soul [intellectual concepts] by which he was conformed to things so as to have knowledge of them would be sufficient for him; but since he is by nature a political and social animal it was necessary that his conceptions be made known to others. This he does through vocal sound. Therefore there had to be significant vocal sounds in order that men might live together. Whence those who speak different languages find it difficult to live together in social unity.

"Again, if man had only sensitive cognition, which is of the here and now, such significant vocal sounds as the other animals use to manifest their conceptions to each other would be sufficient for him to live with others. But man also has the advantage of intellectual cognition, which abstracts from the here and now, and as a consequence, is concerned with things distant fin place and future in time as well as things present according to time and place. Hence, the use of writing was necessary so that he might manifest his conceptions to those who are distant according to place and to those who will come in future time."[30]

Man speaks by means of significant sound. In turn, he knows reality by means of significant concepts; i.e., the concepts in our minds signify or represent reality. So all the instruments we use in knowing and speaking are *signs*. Hence, in order to have thorough and accurate knowledge of all our logical instruments (i.e., thought and language) we should first discuss the nature of a sign. Then we can discuss those particular signs that only animals make and, specifically, those signs that represent the concept: words and terms.

Signs in General

As we did with the concept, we'll begin by giving the definition of signs (thereby explaining their nature, because recall that a definition works by spreading out a things comprehensive notes), then we'll divide it into the various kinds of signs.

The Definition of the Sign

We all have a general understanding of what a sign is. A street sign gives us knowledge of our location, a 'danger' sign alerts us to a threatening situation, a 'no trespassing' sign points out the existence of someone else's property, smoke is a sign of fire, red bumps are a sign of measles, etc. In general, we all

---

[29] Cfr. II-II, q. 91, a. 1., c.; II-II, q. 109, a. 3, ad 1; II-II, q. 110, a. 1, c.

[30] In I Periherm., lect. 1

recognize that a sign is something which gives us knowledge of something else. But signs are much more important (and much more present) than we often recognize. Street signs are surely signs, but so are concepts. Concepts signify other things to us. And language signifies concepts.

A sign, then, is *that which represents something other than itself to a knowing faculty*.[31] Smoke represents fire to the person who sees it; red bumps represent measles to the doctor; STOP represents a law of action to the driver. So, there are three things to consider in any given sign: 1) the thing which signifies something else (e.g., the smoke which is signifying); 2) the distinct object which is known by means of that thing (e.g., the fire which is signified); 3) the relation or nexus between the thing signifying and the thing signified (e.g., the relation of causality between smoke and fire). The sign, properly speaking, consists in that nexus or relation. That relation between the signifying thing and the object signified is called the signification. In other words, the sign formally consists not in the thing signified and not in the thing signifying but in the relation between the two; that relation is like a vehicle moving our knowing powers from a knowledge of one thing to a knowledge of another. However, when I speak of a 'sign' from now on, I'll be referring to the thing which is signified; so, 'smoke' is the sign of fire.

Furthermore, a sign represents something *to a knowing faculty*. Stones are oblivious to signs. Trees take no interest in signification. Only knowing creatures can recognize signs. A sheep sees a wolf and recognizes danger. The eye presents a retinal image and by means of it the power of sight knows the color of the object in the real world. The imagination doesn't really reproduce the things in reality—else our heads would be enormous!—but it has signs (i.e., the phantasms) in which it knows the things we have at some point sensed.

The Division of Signs

So our definition of sign involves a twofold relation: 1) from the thing signifying (which we will call, simply, 'the sign') to the thing signified (e.g., from smoke to fire, from 'no trespassing' to another's property rights, from the concept to the thing in reality); 2) from the sign to the knowing power (e.g., from smoke to the eye, from the concept to the intellect)—so, again, a sign is that which represents something other than itself to a knowing faculty. And we can divide the sign into various kinds of signs as it regards each of these relations: 1) to the thing signified, 2) to the knowing power. In other words, there are different kinds of signs depending on 1) what kind of relation the sign has to the thing signified, and 2) how the knowing power uses the sign to come to know the thing signified.

Related to the Thing Signified

The relation between the sign and the thing signified can be established in two ways: naturally or arbitrarily. Smoke of its very nature signifies some sort of ignition; it naturally signifies an ignited something. A red light does not of its very nature mean that you must stop driving: that a red light signifies 'stop' is purely arbitrary and could change. In fact, the Department of Motor Vehicles could sit down tomorrow and decide that, from now, green will mean stop and red will mean go. Now, arbitrary signs are of two types depending on whether some authoritative decision was made to impose the signification or if it just happened by custom. Hence, signs are divided into three types in relation to the thing signified: natural, conventional, and consuetudinary.

Natural Signs

---

[31] Cfr., III, q. 60, a. 4; De Veritate, q. 9, a. 4, ad 1: "A thing cannot be called a sign in the proper sense unless one can come to know something else as if by reasoning from it…The signs we use are sensible, because our knowledge, which is discursive, has its origin in sense-objects. But we commonly call anything a sign which, being known, leads to the knowledge of something else; and for this reason an intelligible form can be called a sign of the thing which is known by its means."

"The *natural* sign is one that represents from the nature of the thing, independently of any decision or custom."[32] It is an object which of its very nature represents something else without being arbitrarily imposed by some authoritative decision or customary usage. And because its signifying power—its signification— is independent of any decision or choice, it represents the same thing always and everywhere. Because of what smoke is, it will always signify some combustion. A groan is a natural sign of displeasure, while a smile one a person's face is a natural sign of contentment. Electrical activity in a rock is the sign of certain chemical properties. Red bumps are a natural sign of measles. Art is a sign of rationality. Natural signs of their very essence point to something else. Because of this, we do not need to directly observe the thing signified in order to know that it exists—or at least in order to *hypothesize* that something exists. When scientists theorize about physical causes, they are exploring natural signs. Because such-and-such an activity is observed under the microscope scientists reason their way back to the causes which are signified by this activity. Effects, in other words, always signify causes.

Conventional Signs

"The *conventional* sign is one that represents something owing to a voluntary decision of public authority, such as the sound *man*."[33] The vocalization that comes from my mouth when I say 'man' does not naturally signify human nature. If it did, the word for human nature would be the same in every language. But it isn't. The fact that this vocalization should call to mind the concept of human nature is purely arbitrary; it was decided that in English 'man' should represent human nature and there is certainly no reason why this can't change—in fact, in most circles it has indeed already changed. Some people think that 'man' refers only to males, not realizing that our language was derived from Germanic roots: in German, 'man' means people while 'mann' means adult male. So it's silly to think that 'man' is meant to be offensive to women. If anything, English speaking adult males should be offended that they don't get their own word—we're stuck with a generic word for human nature!

Other examples of conventional signs are red lights to indicate a stop, letter grades to indicate academic achievement, a picture of a male and female to indicate restrooms, a bell signifies the end of school, etc. The connection between the thing signifying and the thing signified is in no way natural. The sign signifies merely because it has been consciously chosen to signify. And it could be changed.

Consuetudinary Signs

"The *consuetudinary* sign is one that represents owing to practice alone, independently of any public decision; for example, a napkin on the table signifies lunch." These signs do not naturally represent (because they could be changed) and they were never consciously chosen to signify anything. Instead they signify from mere usage or custom. Let's say a man gets into the habit of taking his pills every evening just before bed. His taking the pills has become a customary sign that his bedtime is approaching. He never intended to signify that bedtime was near by taking his pills, but neither is it natural, because he could have taken his pills in the morning—the significant relationship just happened. In other words, customary signs were never intended to signify anything; they were not voluntarily made to be signs.

Related to the Knowing Faculty

Some signs give knowledge of something else only after the sign itself is first known. So before we can conceive of the necessity to stop our car, we must first see and acknowledge a red light. Before we can

---

[32] John of St. Thomas

[33] ibidem

conclude that a certain man's bedtime is near, we must see him take his pills and recognize that there is a relation between his taking pills and his going to bed.[34]

These signs which must first be known before the thing signified is known we call *instrumental signs*. However, some signs do *not* require us to observe the sign itself before we know what is signified. We call these *formal signs* and I'll explain what they are below. So as regards its relation to the knowing power, the sign is divided into instrumental signs and formal signs.

Instrumental Signs

An instrumental sign is *one which from previous knowledge of itself represents something other than itself*. Smoke doesn't represent fire to the mind unless the smoke first be seen and the mind judges that there is a causal connection between smoke and fire. Instrumental signs signify something else only after they are known in themselves. All the examples we have given above are instrumental signs; they are the most readily observed by us. An instrumental sign is one which is first and foremost some determinate thing, and only secondarily and accidentally a sign. A stop light is first a light, then later it becomes a sign because of the signification we attach to it. Smoke is primarily a thing in itself and only becomes significant when we recognize the nexus between the smoke and the fire. Instrumental signs, then, are essentially things and accidentally signs, and so what's known first is the thing itself and afterwards the signification.[35]

Formal Signs

But sometimes we know a thing signified without first knowing that which signifies—we know something signified before we know the sign in itself. And we know the sign itself only indirectly. This is a formal sign: *one which, without previous knowledge of itself, represents something other than itself*. It's difficult to explain exactly what a formal sign is, because explanation should begin with examples which are better known to the students. Unfortunately, there are only two formal signs in existence: the phantasm and the concept. When I understand something intellectually, I'm making use of concepts because the things I'm understanding don't migrate into my intellect. But, as a child, I understand things for many years before I ever reflect on my concepts and ask *how* I understand them. In fact, we could theoretically go our entire lives without ever thinking about concepts. So what I know first and foremost isn't the intellectual representation of something—what I know primarily isn't the concept itself—but the things in reality. The concept does indeed lead me to a knowledge of other things (hence, it's a sign) but I don't have to know the concept first. In fact, it would be perfectly impossible for me to know the concept first and then know the quiddity of something else second, precisely because the concept is essentially a representation of some quiddity: a concept that represents nothing is not a concept. If I'm understanding, I'm understanding *something*. Intellectual apprehension is a connotative term. I can't understand

---

[34] Cfr. III, q. 60, a. 4, ad 1: "The name and definition of a thing is taken principally from that which belongs to a thing primarily and essentially: and not from that which belongs to it through something else. Now a sensible effect being the primary and direct object of man's knowledge (since all our knowledge springs from the senses) by its very nature leads to the knowledge of something else: whereas intelligible effects are not such as to be able to lead us to the knowledge of something else, except in so far as they are manifested by some other thing, i.e. by certain sensibles. It is for this reason that the name sign is given primarily and principally to things which are offered to the senses; hence Augustine says (De Doctr. Christ. ii) that a sign "is that which conveys something else to the mind, besides the species which it impresses on the senses." But intelligible effects do not partake of the nature of a sign except in so far as they are pointed out by certain signs. And in this way, too, certain things which are not sensible are termed sacraments as it were, in so far as they are signified by certain sensible things, of which we shall treat further on."

[35] De Veritate, q. 9, a. 4: "Although it is true that in natural things, whose effects are more known to us than their causes are, a sign is that which is posterior in nature, the notion of a sign [instrumental], even properly speaking, is not such that a sign need be prior or posterior in nature, but only that is must be known previously by us. For this reason, at times we take effects as signs of causes, as when we judge health from the pulse, and at other times we take causes as signs of effects, as we take the dispositions of heavenly bodies as signs of stormy weather and rain."

nothing. Hence, the concept is not known as a sign in the exact moment that it's functioning as a sign, but only upon reflection. The closest analogy that can be given to help the beginning student understand a formal sign is that of mirror. Imagine walking down the street and catching a glimpse of someone next to you. It appears to be a stranger but there is something familiar about this person. An instant later, you realize that it isn't a stranger at all—it's your own reflection. Properly speaking this is not a formal sign, you have simply misjudged what you were seeing and you mistook reflected light and color for a new person (the mirror itself is a thing first and a representation second). But this is still a useful analogy. In the intellectual concept (and the phantasm, as well) you do not observe the concept first and then see what is known in the concept. That would be like seeing a blank mirror first (i.e., a mirror which has no reflection) and then seeing the mirror image. But this is impossible because a mirror which has no reflection is not a mirror just as a concept which represents nothing is not a concept. It is only upon reflection that you realize it is a mirror and it is only on reflection that you realize you are understanding things through concepts.

So what really is a formal sign? This is really a question for metaphysics but I'll give you a heads up at least: remember I said that an instrumental sign is first a thing and secondly a sign? That is, representing something other than itself is accidental to it, and even if that other signified object didn't exist, the thing which acts as an instrumental sign would still continue to exist. Well, a formal sign is not a thing first and a sign second; a formal sign is *entirely a sign*. That is, its entire nature is to be a sign. Whereas it is of the nature of smoke to be smoke (even if there is no fire) and it becomes a sign only in relation to fire, it is of the nature of formal signs to be only signs and they have no other existence aside from being signs. Recall I said that the nature of signs consists in the relation of signification between what is signifying and what is signified. Well, in formal signs there is *only that relation of signification and the thing signified!* There is no third thing. In other words, formal signs are not things with a relation of signification attached to them. Rather, they are entirely relations. The nature of a concept is to be a relation to some understood object. The nature of a phantasm is to be a relation of similarity to some previously sensed object. To use the mirror analogy again, formal concepts are reflections without the mirror. And whereas we reason *from* or *by* the instrumental signs back to the things they signify (we reason from the presence of smoke to the presence of fire) there is no such rational movement with the formal signs: we don't go from one thing to another; rather, that 'other' is known in the formal sign. Hence, (just to give you some Scholastic terminology) the instrumental sign is called the sign BY WHICH we know something (*quo* or *ex quo*), while the formal sign is called the sign IN WHICH we know something (*in quo*).

"Properly speaking, to discourse [to reason] is to come to the knowledge of one thing through another. There is a difference, however, between knowing something *in* another and knowing it *from* another. For when one thing is known *in* another, the know is, by one motion, directed to both. This is clearly the case when a thing is known in another as in an intelligible form [concept]. This kind of knowledge is not discursive. Moreover, in this regard, it makes no difference whether the thing be seen in its own species or in a different one; for sight is not said to know discursively when it sees a stone either by means of a species [determining, knowable characteristics] received from the stone itself or by seeing the stone's species [determining, knowable characteristics] reflected in a mirror.

"A thing is said to be known *from* another, however, when the motion to both is not the same, but the intellect is first moved to one and from this is moved to the other. Consequently, discourse takes place here, as it evidently takes place in demonstrations. For the intellect is first directed only to principles [premises of the syllogism], then it is directed through the principles to the conclusions."[36]

Again, "Discursion [reasoning] expresses movement of a kind. Now all movement is from something before to something after. Hence discursive knowledge comes about according as from something previously known one attains to the knowledge of what is afterwards known, and which was previously

[36] De Veritate, q. 8, a. 15.; cfr. De Ver., q. 2, a. 3, ad 4.

unknown. But if in the thing perceived something else be seen at the same time, as an object and its image are seen simultaneously in a mirror, it is not discursive knowledge."[37]

This is as far as I want to take the discussion at this point. The nature of relation and sign is a topic for metaphysics. In fact, the logician is only very indirectly concerned with formal signs. We don't order our thoughts by directly manipulating the concepts themselves, but indirectly by arranging the signs of our concepts: by arranging our mental words and terms.

EXERCISES: Are the following natural, conventional, or customary signs?

1. **Smoke as a sign of fire**
2. **Skull and cross-bones on a bottle as a sign of poison**
3. **A ring on the fourth finger as a sign of marriage**
4. **Drinking coffee as a sign that I need to wake up**
5. **A red light as a sign to stop**
6. **Tears on a child's face a sign of discontentment**
7. **Locking the store door as a sign that business hours have passed**
8. **Putting up the word 'closed' in the window as a sign that business hours have passed**
9. **Tipping the hat when passing the church as a sign of respect**
10. **A cat meowing as a sign of pleasure**
11. **A cat placed in the car as a sign that it is going to the groomer**
12. **Making the cross as a sign of faith**
13. **Firing a gun as a sign that the race commences**
14. **Increased pulse as a sign of lying**
15. **A period signifying the end of as sentence**
16. **The word 'man'**
17. **The concept 'man'**

[37] I, q. 58, a. 3, ad 1.

Signs used by Animals Specifically

Hopefully, you now have a better understanding of what signs are. Logic isn't concerned with all signs, though, but only signs that man uses to order thought. We've already discussed the concept in itself (which you now know is a formal sign) so it is left to discuss the external expression of the concept: the word or term. This word or term is expressed to others in three ways: vocally (by using the voice), graphically (by writing or drawing), and gesticulatively (by visual motions).[38] We start with vocalization since it is more common and first in the natural order of development.[39]

Vocalized Signs

Many animals use instrumental vocalized signs to communicate something which is known. Birds have certain calls which excite (by natural instinct) the desire to flee. But when a bird vocalizes some sign, that sign is natural and done by pure instinct. When a man vocalizes, it can also be a conventional sign. Now, in the natural order of development, spoken terms precede written terms, so we begin by looking at vocalization in general (which is common to man and many other animals); then we will look at the various kinds of vocalization including that kind which only man has (articulate vocalization).

Definition of Vocalized Signs

"Voice is the sound of an animal made through the percussion of breathed air on the vocal cord by the soul"[40] and "with the presence of a certain sensible image".[41] Vocalization is the percussion of corporeal organs in an animal under the influence of living forces and the imagination. A 'sensible image' is key here. All voice is significant, though perhaps only *naturally*. A yell is given off under the sensation of pain and it is the sign of pain. "Sometimes the tongue makes sounds which are not voice. Coughing is not voice. For voice to be produced it is required that what strikes the air should be something alive, or with a soul, and also, accompanying this, that an image be present which is meant to signify something. For voice must be significant sound—significant either by nature or conventionally. Hence, the statement that vocal impact proceeds from the soul; for operations proceeding from imagination can be said to be from the soul. It is clear, then, that voice is not the mere impact of breath such as occurs in coughing; and that the principal cause of the production of voice is the soul, using this air, i.e., air inhaled, to force against the windpipe the air within it."[42]

Division of Vocalized Signs

Vocalizations can either be the natural percussion of air along the vocal cords without voluntarily controlled sounds or patterns, or it can be sound produced in the vocal cords with voluntary control and patterning. Hence, the first division of vocalization is into inarticulate and articulate.

Inarticulate Vocalizations

These are common to all animals with voices. Yells, instinctive calls, groans, moans, etc. These sounds involve no voluntary coordinating or controlling of our vocal instruments, nevertheless they signify certain emotions and sensible knowledge that are communicated to other animals. When a brute senses

---

[38] In I Periherm., lect., 2, n. 4.

[39] In I Periherm., lect 2, n. 3.

[40] De II De Anima, Lect. 18.

[41] In I Periherm., lect. 4, n. 3.

[42] In II De Anima, lect. 18.

danger he emits a natural but non-voluntarily crafted vocalization by which his apprehension is communicated to other animals.

Articulate Vocalizations

These inarticulate sounds, though, are not sufficient to communicate the potentially infinite intellectual conceptions of man. So we've been given many other instruments besides simple inhalation and vocal cords to signify our thoughts: we have lips, and teeth, and tongues, and diaphragms, etc. etc. With these instruments, and under the influence of our free wills, we can coordinate our vocalizations and give to them our own conventional significations—i.e., we can make them to be signs of whatever we wish. To do this we invent systems of consonants and vowels. This controlled and near rhythmic development of vocalization is what we call articulation. But not all voluntarily controlled vocalization is significant.

Insignificant Articulation

The classic example is the word 'blitiri'. The word is voluntarily formed by manipulating our tongue, lips, teeth, etc. yet it lacks any conventional signification. It's gibberish. Blitiri doesn't mean anything. Note, however, that 'insignificant' here means lacking any *conventional* signification. Nevertheless, it does *naturally* signify something: namely, desire of the person to speak, even if that desire only produces nonsense.

Significant Articulation

Voluntarily constructed vocalizations are those which conventionally signify something. 'Man', 'dog', 'knowledge', 'Canada', 'to kick'. All of these are vocalizations that signify something which have been intellectually conceived by a person.

Now, there are three things which can be produced by the intellect as we said at the beginning of the course: concepts, propositions, and syllogisms. And we can have significant articulations for each of these. For the concept, we have what is called the spoken *term*[43] (sometimes called the word, however the sign for what is simply apprehended might be several words put together; so we'll use 'term' from now on). For propositions, we have what is called the spoken *enunciation* (also called the *interpretation*—but we'll just stick with 'proposition' so we don't confuse anyone). For the syllogism, we have the spoken *argumentation* (we'll still call it the syllogism). We're only interested in terms right now—we'll deal with enunciations and argumentation later on.

[43] De Veritate, q., 4, a. 1, ad 7. "The nature of a sign belongs more properly to an effect than to a cause when the cause brings about the existence of the effect but not its meaning…But when the effect has derived from its cause, not only its existence, but also its meaning, then this cause is prior to the effect both in existence and in meaning. Hence, signification and manifestation belong more properly to the interior word than to the exterior word, for whatever meaning the exterior word has been adopted to convey is due to the interior word."