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I would like to recapitulate some of the concepts that were discussed at the end of the first logic saves lives podcast. The first hour was mainly Brett and I discussing historical topics to present some context to the narratives we've come to study and understand, but the last half hour we delved into the most important aspect of the essence of logic and the rules associated with it. I had prepared for reviewing and applying the fallacies last week to the Steve Shives presentations we'll be going over in later episodes, but I felt as though I might've lost some people with some of the concepts presented towards the end of the podcast as I hadn't planned to present those in particular, which created a sort of disharmonious blend of many different ideas that might be hard to piece together. I would like to concisely clarify some of those concepts, as they are vitally important to understanding what logic is, what the Trivium is, and how it's a basic *description* of the mind. This short introduction is necessary to understand what an informal fallacy is, as concept formation applies directly to the improper usage of language which creates faulty arguments. The above table of contents is for further reading into the concepts I'll be divulging in this brief, but substantive description.

The ideas of logic are built upon a foundation of how the mind processes information. From observation, we have observed three types of responses to sense stimuli. The first type would be called the primary level, that of a direct-sense experience involving one stimulus and one automatic response, or reflex, with no attendant memory. An example would be a doctor testing out your reflex by applying a mallet against your knee. Your knee automatically responds to the stimulus, with no attendant conscious action on your part. The second level is called the perceptual level. This involves the first level, but adds a brain to the nervous system and subsequently a memory associated with discrete units of stimulus. This memory allows us to connect stimulus together in a causal recognition. An example would be the behavioral conditioning of animals, whereby which they can respond to a sound or a gesture through their sense of hearing or sight, and because of their memory they can respond, automatically, to the behavior that has been conditioned based on the stimulus. This is automatic as well, but has a level of complexity due to the memory of the stimulus.

The last level is the conceptual level, and builds upon the first two. This allows us to abstract, from memory, perceptual instances and differentiate the unique characteristics associated with a sensed phenomenon or thing in reality. An example would be using our five senses to perceive an apple, and then form a concept that extracts the unique characteristics that are universal to all apples, and use a symbol or sound to communicate this abstract concept to others. This level is not automatic – it has a degree of freedom often called free will. Free will is the ability to judge, accurately or inaccurately, the unique characteristics of a concept.

Concept formation is the foundation upon which logic is built, and it's the beginning of the first stage of the Trivium, which we call the General Grammar stage. I mentioned concept formation mixed in with a host of other concepts that might've presented some confusion to the listeners, so let me briefly and basically explain why this idea is so important to logic and the Trivium, and why this is necessary to understand before we dive into applying fallacies to the language people use.

Concepts are immaterial ideas. They have no extension in space and time – you can't measure it. They rest upon an interaction of electrochemical machinery and impulses, but that only allows for the potential for this phenomenon we call conscious reason, it doesn't state what thought we will have or how our ideas match up with reality or other people's thoughts. Concept can be loosely traced back to the Medieval Latin word *conceptum*, "draft, abstract" or classical Latin "(a thing) conceived". It comes from the past participle of *concipere*, *concept*, which means "to take in".

We humans take in stimulus through our five senses, and through our nervous system and memory we can abstract, Latin for "to draw from, to drag out of", in other words, to extricate or extract properties, qualities, and characteristics that we observe from the thing perceived. This is what means it to form a concept. An example would be the apple; we can sense certain characteristics that are in common to many different apples like colors, shapes, sizes, and tastes. From this, we can create a concept about what makes an apple. In order to do that, there are two properties of concept formation that are critical to philosophy and classical, Aristotelian logic. These properties are abstraction and universals.

As I mentioned, to abstract something is Latin for to lift out of, or to extract from something characteristics from the thing being perceived. You can think of it as our mind's ability to compare and contrast information to find what makes things alike or different. From this property, we can identify what I mentioned in the first podcast as key, differentiating factors; qualities and properties that make something truly unique compared to the other things we perceive in reality. Those unique characteristics, through abstraction, are called universals. Universals come from the Latin *uni*, one, *versal*, with respect to many. In other words, universals are properties and qualities that can be said about many things that exist. An apple is a round fruit with red, yellow, or green skin and firm white flesh. A tree is a plant that has branches, bark, and a root system. The following examples can be said about all apples and all trees. How did I identify those characteristics? I perceived many different apples and trees, and I was able to abstract the unique characteristics that all apples and trees have in common. This is what we call essence in Aristotelian logic. We see many different types of apples and trees, but we don't see the nature of the apple or tree, its *appleness* or *treeness*. Through abstraction, we bring all apples and trees under one concept "apple" or "tree", held in our mind, and communicated through language.

What definition does is to take concept formation one step further and ask you to use multiple concepts to define new ones. It asks you to define a term, which is a word or group of words or phrase that identifies a concept, and asks you to define it using other concepts. Man is a rational animal. So we understand the concept man, rational, and animal all separately. But, when you combine them together you use multiple concepts to define what is implied in the concept of man. In other words, you're breaking the art of abstraction into its component parts, like a physicist reducing a force down to its component parts, to help identify the characteristics that make something truly unique and universal. You can think of it, loosely, as the formula logicians use to help identify the universal essence to a concept. The way this is done is by identifying the *genus*, or the *general* characteristics that are in common to man, in contrast to the *specific difference*, or the properties that make man different. In this case, the genus would be animal,

and the specific difference would be rational. Man is a rational animal. From this, you can glean what question this answers, thereby relating it to what category, in existence, this belongs.

So now we have a very basic understanding of what a concept is, and how it relies on two properties to create a **concept; abstraction** and **universals**, which identify the **essence** of a concept, and the “formula” used to define concepts (definition of concept = genus + specific difference). Once we identify the essence of a concept, the universal, we tend to group them into categories based on the unique characteristics of the concept. In the general grammar stage, Gene Odening presented a definition of existence, which is every substance, action, attribute, and relationship that is, was, or ever will be. This definition relates to the concepts of existence; substance is every noun and pronoun, actions are verbs, attributes are adjectives and adverbs, and relationships are prepositions and conjunctions. An apple is a round fruit with red, yellow, or green skin and firm white flesh. Now, as you continue to break concepts down, by definition, to include all of the real, perceivable aspects a thing or entity might have in existence, you end up with Aristotle’s ten categories of being. An example would be the concept of an apple. The apple is a fruit, but what’s a fruit? A fruit is a seed-bearing structure that develops from the ovary of a flowering plant. But what’s a plant? Plants are multicellular eukaryotes. As you continue to ask more questions about what something is, you lose comprehension but gain extension; in other words the terms have less meaning but apply to more and more things in reality. Aristotle was the first to abstract to the most general categories that represent all real things that exist – abstracted from sense perception and understood and communicated through language.

If we go back to the apple example, we can apply the definition of an apple to the general categories of being, or the definition of existence. An apple is a fruit-(substance) with-(relationship) red-(attribute), yellow-(attribute), or-(relationship) green-(attribute) skin-(substance) and-(relationship) firm-(attribute) white-(attribute) flesh-(substance). This simple example can be extrapolated to all types of definitions and be shown to relate to the categories of reality and the definition of existence.

We have a clear line from how our minds interpret stimulus, to developing concepts using abstractions to identify universal essences in things, to formulating definitions and relating the most general categories of reality to which all real things belong and showing how language relates to those basic categories. This is the total subject of general grammar. The long, arduous terminology can be summed up by saying our mind compares and contrasts information it has perceived from our five senses, and makes a judgment, through language, as to what something is or not. Now, in the general grammar stage your listeners will be familiar with the 5 W’s + How. Who, what, where, when, why, and how. These questions effectively answer to the concepts of existence by identifying one of the main constituent categories implied in existence. Similar to the physicist metaphor, we’re doing the same thing here with logic. I broke down what the general grammar stage is based on how we develop and define a concept, which leads up to the five simple questions we ask to start gathering and categorizing data. This is how the mind works.

As a last note, the history of philosophy is basically a history of man’s ability to abstract and create universal concepts. There is a philosophic war about the reality of universals that has been going on since the beginnings of philosophy. This is effectually what was destroyed towards the end of the 19th and the beginning of the 20th centuries with the new psychology and radical empiricism that denied metaphysics for a mechanized viewpoint of the human being, which continues today through philosophies and scientific endeavors such as cybernetics, and transhumanism. If people are interested in understanding the “war on universals” I will refer them to the contents in the beginning of this document and follow the link to “The Problem of Universals”.

Section 3. The two logics (P)

(This section can be omitted without losing anything you will need later on in the book. It's here both to satisfy the advanced student's curiosity and to sell the approach of this book to prospective teachers who may question its emphasis on Aristotelian rather than symbolic logic, by justifying this choice philosophically.)

Almost four hundred years before Christ, Aristotle wrote the world's first logic textbook. Actually it was six short books, which collectively came to be known as the *Organon*, or "instrument." From then until 1913, when Bertrand Russell and Alfred North Whitehead published *Principia Mathematica*, the first classic of mathematical or symbolic logic, all students learned Aristotelian logic, the logic taught in this book.

The only other "new logic" for twenty-four centuries was an improvement on the principles of *inductive* logic by Francis Bacon's *Novum Organum* ("New Organon"), in the 17th century, and another by John Stuart Mill, in the 19th century.

(Inductive reasoning could be very roughly and inadequately defined as reasoning from concrete particular instances, known by experience, while deduction reasons from general principles. Induction yields only probability, while deduction yields certainty. "Socrates, Plato and Aristotle are mortal, therefore probably all men are mortal" is an example of inductive reasoning; "All men are mortal, and Socrates is a man, therefore Socrates is mortal" is an example of deductive reasoning.)

Today nearly all logic textbooks use the new mathematical, or symbolic, logic as a kind of new language system for deductive logic. (It is not a new *logic*; logical principles are unchangeable, like the principles of algebra. It is more like changing from Roman numerals to Arabic numerals.) There are at least three reasons *for* this change:

- (1) The first and most important one is that the new logic really is superior to the old in efficiency for expressing many long and complex arguments, as Arabic numerals are to Roman numerals, or a digital computer to an analog computer, or writing in shorthand to writing in longhand.

However, longhand is superior to shorthand in other ways: e.g. it has more beauty and elegance, it is intelligible to more people, and it gives a more personal touch. That is why most people prefer longhand most of the time - as most beginners prefer simpler computers (or even pens). It is somewhat similar in logic: most people "argue in longhand," i.e. ordinary language; and Aristotelian logic stays close to ordinary language. That is why Aristotelian logic is more practical for beginners.

Even though symbolic language is superior in sophistication, it depends on commonsense logic as its foundation and root. Thus you will have a firmer foundation for all advanced logics if you first master this most basic logic. Strong roots are the key to healthy branches and leaves for any tree. Any farmer knows that the way to get better fruit is to tend the roots, not the fruits. (This is only an analogy. Analogies do not *prove* anything - that is a common fallacy - they only illuminate and illustrate. But it is an illuminating analogy.)

Modern symbolic logic is *mathematical* logic. "Modern symbolic logic has been developed primarily by mathematicians with mathematical applications in mind." This from one of its defenders, not one of its critics (Henry C. Bayerly, in *A Primer of Logic*. N.Y.: Harper & Row, 1973, p.4).

Mathematics is a wonderful invention for saving time and empowering science, but it is not very useful in most ordinary conversations, especially philosophical conversations. The more important the subject matter, the less relevant

mathematics seems. Its forte is quantity, not quality. Mathematics is the only totally clear, utterly unambiguous language in the world; yet it cannot say anything very interesting about anything very important. Compare the exercises in a symbolic logic text with those in this text. How many are taken from the Great Books? How many are from conversations you could have had in real life?

(2) A second reason for the popularity of symbolic logic is probably its more scientific and exact form. The very artificiality of its language is a plus for its defenders. But it is a minus for ordinary people. In fact, Ludwig Wittgenstein, probably the most influential philosophical logician of the 20th century, admitted, in *Philosophical Investigations*, that "because of the basic differences between natural and artificial languages, often such translations [between natural-language sentences and artificial symbolic language] are not even possible in principle." "Many logicians now agree that the methods of symbolic logic are of little practical usefulness in dealing with much reasoning encountered in real-life situations" (Stephen N. Thomas, *Practical Reasoning in Natural Language*, Prentice-Hall, 1973).

- And in philosophy! "However helpful symbolic logic may be as a tool of the . . . sciences, it is [relatively] useless as a tool of philosophy. Philosophy aims at insight into principles and into the relationship of conclusions to the principles from which they are derived. Symbolic logic, however, does not aim at giving such insight" (Andrew Bachhuber, *Introduction to Logic* (New York: Appleton-Century Crofts, 1957), p. 318).

(3) But there is a third reason for the popularity of symbolic logic among philosophers, which is more substantial, for it involves a very important difference in philosophical belief. The old, Aristotelian logic was often scorned by 20th century philosophers because it rests on two commonsensical but unfashionable philosophical presuppositions. The technical names for them are "epistemological realism" and "metaphysical realism." These two positions were held by the vast majority of all philosophers for over 2000 years (roughly, from Socrates to the 18th century) and are still held by most ordinary people today, since they seem so commonsensical, but they were *not* held by many of the influential philosophers of the past three centuries.

(The following summary should not scare off beginners; it is much more abstract and theoretical than most of the rest of this book.)

The first of these two presuppositions, "epistemological realism," is the belief that the object of human reason, when reason is working naturally and rightly, is objective reality as it really is; that human reason can know objective reality, and can sometimes know it with certainty; that when we say "two apples plus two apples must always be four apples," or that "apples grow on trees," we are saying something true about the universe, not just about how we think or about how we choose to use symbols and words. Today many philosophers are

skeptical of this belief, and call it naive, largely because of two 18th century "Enlightenment" philosophers, Hume and Kant.

Hume inherited from his predecessor Locke the fatal assumption that the immediate object of human knowledge is our own ideas rather than objective reality. Locke naively assumed that we could know that these ideas "corresponded" to objective reality, somewhat like photographs; but it is difficult to see how we can be sure any photograph accurately corresponds to the real object of which it is a photograph if the only things we can ever know directly are photographs and not real objects. Hume drew the logical conclusion of skepticism from Locke's premise.

Once he limited the objects of knowledge to our own ideas, Hume then distinguished two kinds of propositions expressing these ideas: what he called "matters of fact" and "relations of ideas."

What Hume called "relations of ideas" are essentially what Kant later called "analytic propositions" and what logicians now call "tautologies": propositions that are true by definition, true only because their predicate merely repeats all or part of their subject (e.g. "Trees are trees" or "Unicorns are not non-unicorns" or "Unmarried men are men").

What Hume called "matters of fact" are essentially what Kant called "synthetic propositions," propositions whose predicate adds some new information to the subject (like "No Englishman is 25 feet tall" or "Some trees never shed their leaves"); and these "matters of fact," according to Hume, could be known only by sense observation. Thus they were always particular (e.g. "These two men are bald") rather than universal (e.g. "*All* men are mortal"), for we do not *sense* universals (like "all men"), only particulars (like "these two men").

Common sense says that we can be certain of some universal truths, e.g., that all men are mortal, and therefore that Socrates is mortal because he is a man. But according to Hume we cannot be certain of universal truths like "all men are mortal" because the only way we can come to know them is by generalizing from particular sense experiences (this man is mortal, and that man is mortal, etc.); and we cannot sense all men, only some, so our generalization can only be probable. Hume argued that particular facts deduced from these only-probable general principles could never be known or predicted with certainty. If it is only probably true that all men are mortal, then it is only probably true that Socrates is mortal. The fact that we have seen the sun rise millions of times does not prove that it will necessarily rise tomorrow.

Hume's "bottom line" conclusion from this analysis is skepticism: there is no certain knowledge of objective reality ("matters of fact"), only of our own ideas ("relations of ideas"). We have only *probable* knowledge of objective reality. Even scientific knowledge, Hume thought, was only probable, not certain, because science assumes the principle of causality, and this principle, according to Hume, is only a subjective association of ideas in our minds. Because we have seen a "constant conjunction" of birds and eggs, because we have seen eggs

follow birds so often, we naturally assume that the bird is the *cause* of the egg. But we do not *see* causality itself, the causal relation itself between the bird and the egg. And we certainly do not *see* (with our eyes) the universal "principle of causality." So Hume concluded that we do not really have the knowledge of objective reality that we naturally think we have. We must be skeptics, if we are only Humean beings.

Kant accepted most of Hume's analysis but said, in effect, "I Kant accept your skeptical conclusion." He avoided this conclusion by claiming that human knowledge does not fail to do its job because its job is not to *conform* to objective reality (or "things-in-themselves," as he called it), i.e. to correspond to it or copy it. Rather, knowledge *constructs* or *forms* reality as an artist constructs or forms a work of art. The knowing subject determines the known object rather than vice versa. Human knowledge does its job very well, but its job is not to *learn* what is, but to *make* what is, to form it and structure it and impose meanings on it. (Kant distinguished three such levels of imposed meanings: the two "forms of apperception": time and space; twelve abstract logical "categories" such as causality, necessity, and relation; and the three "ideas of pure reason": God, self, and world.) Thus the world of experience is formed by our knowing it rather than our knowledge being formed by the world. Kant called this idea his "Copernican Revolution in philosophy." It is sometimes called "epistemological idealism" or "Kantian idealism," to distinguish it from epistemological realism.

("Epistemology" is that division of philosophy which studies human knowing. The term "epistemological idealism" is sometimes used in a different way, to mean the belief that ideas rather than objective reality are the objects of our knowledge; in *that* sense, Locke and Hume are epistemological idealists too. But if we use "epistemological idealism" to mean the belief that the human idea (or knowing, or consciousness) determines its object rather than being determined by it, then Kant is the first epistemological idealist.)

The "bottom line" for logic is that if you agree with either Hume or Kant, logic becomes the mere manipulation of our symbols, not the principles for a true orderly knowledge of an ordered world. For instance, according to epistemological idealism, general "categories" like "relation" or "quality" or "cause" or "time" are only mental classifications we make, not real features of the world that we discover.

In such a logic, "genus" and "species" mean something very different than in Aristotelian logic: they mean only any larger class and smaller sub-class that we mentally construct. But for Aristotle a "genus" is the general or common part of a thing's real essential nature (e.g. "animal" is man's *genus*), and a "species" is the whole essence (e.g. "rational animal" is man's *species*). (See Chapter III, Sections 2 and 3.)

Another place where modern symbolic logic merely manipulates mental symbols while traditional Aristotelian logic expresses insight into objective reality is the interpretation of a conditional (or "hypothetical") proposition such as

"If it rains, I will get wet." Aristotelian logic, like common sense, interprets this proposition as an insight into real causality: the rain causes me to get wet. I am predicting the effect from the cause. But symbolic logic does not allow this commonsensical, realistic interpretation. It is skeptical of the "naive" assumption of epistemological realism, that we can know real things like real causality; and this produces the radically anti-commonsensical (or, as they say so euphemistically, "counter-intuitive") "problem of material implication" (see page 23).

Besides epistemological realism, Aristotelian logic also implicitly assumes metaphysical realism. (Metaphysics is that division of philosophy which investigates what reality is; epistemology is that division of philosophy which investigates what knowing is.) Epistemological realism contends that the object of intelligence is reality. Metaphysical realism contends that reality is intelligible; that it includes a real order; that when we say "man is a rational animal," e.g., we are not imposing an order on a reality that is really random or chaotic or unknowable; that we are expressing our *discovery* of order, not our *creation* of order; that "categories" like "man" or "animal" or "thing" or "attribute" are taken from reality into our language and thought, not imposed on reality from our language and thought.

Metaphysical realism naturally goes with epistemological realism. Technically, metaphysical realism is the belief that universal concepts correspond to reality; that things really have common natures; that "universals" such as "human nature" are real and that we can know them.

There are two forms of metaphysical realism: Plato thought that these universals were real *things* in themselves, while Aristotle thought, more commonsensically, that they were real *aspects* of things which we mentally abstracted from things. (See Chapter II, Section 3, "The Problem of Universals.")

The opposite of realism is "nominalism," the belief that universals are only man-made *nomini* (names). William of Ockham (1285-1349) is the philosopher who is usually credited (or debited) with being the founder of nominalism.

Aristotelian logic assumes both epistemological realism and metaphysical realism because it begins with the "first act of the mind," the act of understanding a universal, or a nature, or an essence (such as the nature of "apple" or "man"). These universals, or essences, are known by concepts and expressed by what logic calls "terms." Then two of these universal terms are related as subjects and predicates of propositions (e.g. "Apples are fruits," or "Man is mortal").

"Aristotle never intended his logic to be a merely formal calculus [like mathematics]. He tied logic to his ontology [metaphysics]: thinking in concepts presupposes that the world is formed of stable species" (J. Lenoble, *La notion de l'expérience*, Paris, 1930, p. 35).

Symbolic logic is a set of symbols and rules for manipulating them, without needing to know their meaning and content, or their relationship to the real world, their "truth" in the traditional, commonsensical sense of "truth." A

computer can do symbolic logic. It is quantitative (digital), not qualitative. It is reducible to mathematics.

The new logic is sometimes called "propositional logic" as well as "mathematical logic" or "symbolic logic" because it *begins with propositions, not terms*. For terms (like "man" or "apple") express universals, or essences, or natures; and this implicitly assumes metaphysical realism (that universals are real) and epistemological realism (that we can know them as they really are).

Typically modern philosophers criticize this assumption as naive, but it seems to me that this is a very reasonable assumption, and not naive at all. Is it too naive to assume that we know what an apple is? The new logic has no means of saying, and even prevents us from saying, *what* anything is!

And if we cease to say it, we will soon cease to think it, for there will be no holding-places in our language for the thought. Language is the house of thought, and homelessness is as life-threatening for thoughts as it is for people. If we should begin to speak and think only in nominalist terms, this would be a monumental historic change. It would reverse the evolutionary event by which man rose above the animal in gaining the ability to know abstract universals. It would be the mental equivalent of going naked on all fours, living in trees, and eating bugs and bananas. (Could monkeys have evolved by natural selection from nominalists?)

While it may be "extremist" to suggest it, such a mental "devolution" is not intrinsically impossible. And changes in logic are not wholly unrelated to it. Already, "internet logic," or the logic of spontaneous association by "keywords," is replacing "genus and species logic," or the logic of an ordered hierarchy of objectively real categories. To most modern minds, those last seven words sound almost as archaic as alchemy or feudalism. Many criticize them as ideologically dangerous. These critics dislike categories because they "feel that" (that phrase is a category confusion, by the way) classifications, and universal statements about classes such as "Hittites could not read Hebrew," constitute "prejudice," "judgmentalism," "oppression," or even "hate speech."

Logic and social change are not unrelated. Not only our logicians but also our society no longer thinks primarily about the fundamental metaphysical question, the question of *what things are*, the question of the nature of things. Instead, we think about how we feel about things, about how we can use them, how we see them behave, how they work, how we can change them, or how we can predict and control their behavior by technology. But all this does not raise us above the animal level in kind, only in degree. The higher animals too have feelings, and things to use, and sight, and action, and even a kind of technology of behavior prediction and control. For the art of hunting is an art of predicting and controlling the behavior of other animals. What do we have that no mere animal has? The thing that many modern philosophers vilify: abstraction. We have the power to abstract and understand universals. This is the thing traditional logic is founded on, and this is the thing symbolic logic ignores or denies.

Logic is deeply related to moral and ethical changes in both thought and practice. All previous societies had a strong, nearly universal, and rarely questioned consensus about at least some basic aspects of a "natural moral law," about what was "natural" and what was "unnatural." There may not have been a greater *obedience* to this law, but there was a much greater *knowledge* of it, or agreement about it. Today, especially in the realm of sex (by far the most radically changed area of human life in both belief and practice), our more "advanced" minds find the old language about "unnatural acts" not only "politically incorrect" but literally incomprehensible, because they no longer accept the legitimacy of the very question of the "nature" of a thing. Issues like homosexuality, contraception, masturbation, pedophilia, incest, divorce, adultery, abortion, and even bestiality are increasingly debated in other terms than the "nature" of sexuality, or the "nature" of femininity and masculinity. It is not an unthinkable suspicion that one of the most powerful forces driving the new logic is more social than philosophical, and more sexual than logical.

Symbolic logic naturally fosters *utilitarian ethics*, which is essentially an ethic of consequences. The fundamental principle of utilitarianism is that an act is good if its probable consequences result in "the greatest happiness for the greatest number" of people. It is an "if... then..." ethics of calculating consequences - essentially, "the end justifies the means" (though that formula is somewhat ambiguous). Symbolic logic fits this perfectly because it is essentially an "if... then..." logic, a calculation of logical consequences. Its basic unit is the proposition (p or q) and its basic judgment is "if p then q." In contrast, Aristotelian logic naturally fosters a "natural law ethic," an ethic of universal principles, based on the nature of things, especially the nature of man. For its basic unit is the term, a subject (S) or a predicate (P) *within* a proposition (p); and its basic judgment is "all S is P" - a statement of universal truth about the *nature* of S and P.

The very nature of reason itself is understood differently by the new symbolic logic than it was by the traditional Aristotelian logic. "Reason" used to mean essentially "all that distinguishes man from the beasts," including intuition, understanding, wisdom, moral conscience, and aesthetic appreciation, as well as calculation. "Reason" now usually means only the last of those powers. That is why many thinkers today who seem at first quite sane in other ways actually believe that there is no fundamental difference between "natural intelligence" and "artificial intelligence" - in other words, you are nothing but a computer plus an ape. (Having met some of these people at MIT, I must admit that their self-description sometimes seems quite accurate.)

Aristotelian logic is not exact enough for the nominalistic mathematical logician, and it is too exact for the pop psychology subjectivist or New Age mystic. Out at sea there between Scylla and Charybdis, it reveals by contrast the double tragedy of modern thought in its alienation between form and matter, structure

and content, validity and meaning. This alienated mind was described memorably by C.S. Lewis: "the two hemispheres of my brain stood in sharpest contrast. On the one hand, a glib and shallow rationalism. On the other, a many-islanded sea of myth and poetry. Nearly all that I loved, I believed subjective. Nearly all that was real, I thought grim and meaningless" (*Surprised by Joy*). Neither mathematical logic nor "experience" can heal this gap; but Aristotelian logic can. It is thought's soul and body together, yet not confused. Mathematical logic alone is abstract and "angelistic," and sense experience and feeling alone is concrete and "animalistic," but Aristotelian logic is a human instrument for human beings.

Aristotelian logic is also easier, simpler, and therefore time-saving. For example, in a logic text book misleadingly entitled *Practical Reasoning in Natural Language*, the author takes six full pages of symbolic logic to analyze a simple syllogism from Plato's *Republic* that proves that justice is not rightly defined as "telling the truth and paying back what is owed" because returning a weapon to a madman is no? justice but it *is* telling the truth and paying back what is owed. (pp. 224-30). Another single syllogism of Hume's takes *eight* pages to analyze (pp. 278-86).

I have found that students who are well trained in Aristotelian logic are much better at arguing, and at understanding arguments, than students who are trained only in symbolic logic. For Aristotelian logic is the logic of the four most basic verbal communication arts: reading, writing, listening, and speaking. It is the logic of Socrates. If you want to be a Socrates, this is the logic you should begin with.

The old logic is like the old classic movies: strong on substance rather than sophistication. The new logic is like typically modern movies: strong on "special effects" but weak on substance (theme, character, plot); strong on the technological "bells and whistles" but weak on the human side. But logic should be a human instrument; logic was made for man, not man for logic.

Section 4. All of logic in two pages: an overview (B)

This is one of the shortest and simplest sections in this book, but it is also one of the most important, for it is the foundation for everything else in logic. If you do not understand it clearly, you will be hopelessly confused later on. (It is explained in more detail in the next section, Section 5.)

The ancient philosophers defined Man as the "rational animal." To be human is (among other things) to reason, to give reasons for believing things to be true.

We can see common forms, or structures, in all human reasoning, no matter what the contents, or objects, that we reason about. Logic studies those structures.

The fundamental structure of all reasoning is the movement of the mind from *premises* to a *conclusion*. The conclusion is what you are trying to prove to be true; the premises are the reasons or evidence for the truth of the conclusion.

The two basic kinds of reasoning are *inductive* and *deductive*. Inductive reasoning reasons from particular premises (e.g. "I'm mortal" and "You're mortal" and "He's mortal" and "She's mortal"), usually to a more general or universal conclusion (e.g. "All men are mortal"). Deductive reasoning reasons from at least one general, or universal premise (e.g. "All men are mortal") usually to a more particular conclusion (e.g. "I am mortal"). Inductive reasoning yields only probability, not certainty. (It is not certain that all men are mortal merely on the basis that four men, or 4 million, are.) Deductive reasoning, when correct, yields certainty. (It is certain that if all men are mortal, and if I am a man, then I am mortal.)

A deductive argument succeeds in proving its conclusion to be true if and only if three conditions are met. These are **the three check points of any deductive argument**.

(1) First, *all the terms must be clear* and unambiguous. If a term is ambiguous, it should be defined, to make it clear. Otherwise, the two parties to the argument may think they are talking about the same thing when they are not.

(2) Second, *all the premises must be true*. You can (seem to) "prove" *anything* from false premises: e.g. "All Martians are infallible, and I am a Martian, therefore I am infallible."

(3) Third, *the argument must be logically valid*. That is, the conclusion must necessarily follow from the premises, so that *if* the premises are true, then the conclusion *must* be true.

(1) A "term" in logic is the subject or the predicate of a proposition (a declarative sentence). *Terms* are either *clear* or *unclear*. Terms cannot be either true or false. E.g. "mortal" is neither true nor false. The *proposition* "All men are mortal" is true, and the proposition "Some men are not mortal" is false.

(2) Propositions are declarative sentences. They are either *true* or *false*. "True," in commonsense usage, means "corresponding to reality," and "false" means the opposite. There is no one simple and infallible way of telling whether any proposition is true or false.

(3) There is, however, a fairly simple and truly infallible way of telling whether an argument is *valid* or *invalid*: the laws of logic, which you will learn in this book.

A deductive argument is logically valid if its conclusion necessarily follows from its premises, invalid if it does not. There are various forms of argument, and each form has its own inherent rules for validity.

All the rules for each form of argument are natural to that form of argument and to the human mind. If at any point in this book you think that any of its logical laws contradict what you already implicitly know by innate common sense, please stop and check; for you must be misunderstanding either the laws of logic or what you think common sense tells you, for *logic does nothing more than make explicit the rules everyone knows innately by common sense*.

Arguments are made up of propositions (premises and a conclusion), and propositions are made up of terms (subject and predicate). Terms are either clear or unclear. Propositions (whether premises or the conclusion) are either true or false. Arguments are either logically valid or invalid. Only terms can be clear or unclear; only propositions can be true or false; only arguments can be logically valid or invalid.

So **the three questions you should habitually ask** of yourself when writing or speaking, and of others when you are reading or listening to them, are:

(1) Are the terms all clear and unambiguous?

(2) Are the premises all true?

(3) Is the reasoning all logically valid?

If the answer to all three of these questions is Yes, then the conclusion of the argument must be true.

So in order to **disagree with any conclusion, you must show that there is either (1) an ambiguous term, or (2) a false premise, or (3) a logical fallacy** in the argument such that the conclusion does not necessarily follow from the premises. (You will soon learn the rules for judging that.) If you cannot do any of these three things, then honesty demands that you admit that the conclusion has been proved to be true. (All this applies to deductive arguments only; inductive arguments do not claim certainty.)

Section 5. The three acts of the mind (B)

This section gives you the outline for all of logic. It is an expansion of the previous section (Section 4) and a summary of the rest of the book.

The basis for the science and art of logic is two facts: the fact that human beings think, and the fact that thought has a structure. That structure can be classified from various points of view and for various purposes. For instance, a physiologist or physician might distinguish brain activity of the autonomic nervous system (e.g. breathing) from activity of the frontal lobes (self-conscious thought). A moralist might distinguish thoughts that are voluntary, and under our control, from those that are involuntary, since we are responsible only for what is under our control. A Marxist would distinguish thoughts supposedly produced by a Capitalist system from those produced by a Communist system. But from the viewpoint of logic, we distinguish three kinds of thoughts, three "acts of the mind":

- 1. Simple apprehension**
- 2. Judging**
- 3. Reasoning**

"Simple apprehension" is a technical term. It means basically "conceiving," "understanding," or "comprehending" one object of thought, one concept, such as 'mortal' or 'man' or 'triangle' or 'triangle with unequal angles.' Animals apparently cannot perform this act of understanding; if they can, they do not express it in words. Computers certainly cannot do this; a computer no more *understands* what you program into it than a library building understands the information in the books you put into it.

Judging is more complex than simple apprehension. Instead of just thinking one concept, like 'man,' it relates two concepts, like "man" and "mortal," to each other by predicating one term (the predicate) of the other (the subject) in judging that, e.g., "Man is mortal" or "Man is not a triangle."

As judging is more complex than simple apprehension, reasoning is more complex than judging. As judging moves from one act of simple apprehension (the subject) to another (the predicate), reasoning moves from two or more judgments (the premises, or assumptions) to another (the conclusion) in arguing that if the premises are true, then the conclusion must be true. E.g. "All men are mortal, and I am a man, therefore I am mortal," or "A man is not a triangle, and that is a triangle, therefore that is not a man."

The mental products produced in the mind by the three acts of the mind are:

- 1. Concepts (the products of conceiving)**
- 2. Judgments (the products of judging)**
- 3. Arguments (the products of reasoning, or arguing)**

Distinguishing between the acts and their objects is not crucial for logic. What is crucial is distinguishing the three acts, and the three objects.

These three mental entities (concepts, judgments, and arguments) are expressed in logic as:

1. Terms

2. Propositions

3. Arguments (the most usual form of which is the **sylogism**)

They are expressed in language as:

1. Words or phrases (less than a complete sentence)

2. Declarative sentences

3. Paragraphs, or at least two or more declarative sentences connected by a word like 'therefore' which indicates an argument

Examples:

1. "Man"

2. "Socrates is a man."

3. "All men are mortal, and Socrates is a man, therefore Socrates is mortal."

(Logic does not deal with *interrogative sentences* (questions, like "What time is it?"), *imperative sentences* (commands or requests, like "Pass the mustard, please"), *exclamatory sentences* (like "Oh! Wow! What a hit!"), or *performative sentences* (like "I dub thee knight"), but only with declarative sentences, sentences that claim to state a truth.) Non-declarative sentences are not propositions.

The difference between *logic* and *language* is (1) that languages are man-made artifices and therefore (2) there are many languages that are different in place and time, while (1) logic is not made but discovered, and (2) there is only one logic. There is no "Chinese logic" or "American logic," no "19th century logic" or "20th century logic," or even "masculine logic" or "feminine logic," just logic. (What is often called "feminine logic" is intuition rather than logic: a formidable and invaluable power of the mind but not teachable by textbooks.) Like mathematics, logic is objective, universal, and unchangeable in its basic laws or principles. But the forms in which these unchangeable laws of logic are expressed are linguistic forms, and these forms are changing and varied.

A *term* has no structural parts. It is a basic unit of meaning, like the number one in math or like an atom in the old atomic theory (when they believed atoms were unsplitable and had no parts).

A *proposition* has two structural parts: the subject term and the predicate term. *The subject term is what you're talking about. The predicate term is what you say about the subject.* The word "subject" and "predicate" mean the same thing in logic as in grammar.

An *argument* has two structural parts: the premises and the conclusion. The premises are the propositions that are assumed. They are the reasons or evidence for the conclusion. The conclusion is the proposition that you are trying to prove.

For instance, in the classic example "All men are mortal, and I am a man, therefore I am mortal," the argument is everything inside the quotation marks. The two premises are (a) "All men are mortal" and (b) "I am a man." The conclusion is "I am mortal." The subject of the first premise is "men" and the predicate is "mortal;" the subject of the second premise is "I" and the predicate is "a man;" and the subject of the conclusion is "I" and the predicate is "mortal."

Structural parts of a term: none

Structural parts of a proposition: subject term & predicate term
Structural parts of an argument: premises & conclusion

We can think of the subject and predicate terms as two rooms which together make up one floor of a building (say, a town house). Each floor is a proposition. A syllogism is a building with three floors. The rooms are the parts of the floors, and the floors are the parts of the building.

1st premise

2nd premise

y. argument

conclusion

These three logical entities answer three different questions, the three most fundamental questions we can ask about anything:

1. A *term* answers the question *what it is*.

2. A *proposition* answers the question *whether it is*.

3. An *argument* answers the question *why it is*.

1. "What are we talking about? "Man."

2. "What are we saying about it?" "That man *is* mortal."

3. "Why is it mortal?" "Because man is an animal, and all animals are mortal, therefore man is mortal."

Terms, propositions, and arguments reveal three different aspects of reality:

1. *Terms* reveal *essences* (*what a thing is*).

2. *Propositions* reveal *existence* (*whether it is*).

3. *Arguments* reveal *causes* (*why it is*).

This (above) is the theoretical basis for the practical art of logic. The practical art consists in discriminating between clear and unclear (ambiguous) terms, true and false propositions, and logically valid and invalid arguments.

Logic is a (practical) *art* as well as a (theoretical) *science*. Therefore it does not only tell us what *is* but also what *should* be; it not only *reveals* these three fundamental logical structures but also *judges* and tries to improve them. For all three can be either logically good or logically bad:

1. *Terms* are either *clear or unclear* (ambiguous).

2. *Propositions* are either *true or false*.

3. *Arguments* are either *valid or invalid*

You will be hopelessly confused for the rest of this book if you do not clearly understand this.

Terms are never true or false in themselves; the propositions they are in are true or false.

Terms are never valid or invalid. Only arguments are valid or invalid. Terms are only either clear or unclear.

Propositions are never clear or unclear; the terms in them are clear or unclear.

Propositions are never valid or invalid in themselves; the arguments they are parts of are either valid or invalid.

Propositions are only either true or false.

Arguments are never clear or unclear; each of the terms in an argument is clear or unclear.

Arguments are never true or false. Each of the propositions in an argument is true or false.

Arguments are only either valid or invalid.

Most (but not all) of logic consists of deciding when arguments are valid. "Valid" is a technical term in logic. It does not mean just "acceptable." *An argument is logically valid when its conclusion necessarily follows from its premises.* That is, "if the premises are all true, then the conclusion must be true" - that is the definition of a valid argument. An invalid argument is one in which the conclusion does not necessarily follow even if the premises are true.

For instance, this argument is valid:

All men are mortal. And I am a man.

Therefore I am mortal.

But this argument is not valid: All men are

mortal.

And all pigs are mortal. Therefore all pigs are

men.

It is invalid not just because the conclusion is false but because the conclusion does not follow from the premises. The following argument is also invalid, even though the conclusion (and also each premise) is true:

All men are mortal. And Socrates is

mortal.

Therefore Socrates is a man.

For this argument has the same logical form as the one above it; it merely replaces "pigs" with "Socrates."

An argument may have nothing but true propositions in it, yet be invalid. E.g.:

I exist.

And grass is green. Therefore Antarctica is cold.

An argument may have false propositions in it and yet be logically valid. E.g.:

I am a cat.

And all cats are gods. Therefore I am a god.

For if both those premises were true (that I am a cat and that all cats are gods) it would necessarily follow that I was a god.

An argument that has nothing but true propositions and also is logically valid is the only kind of argument that is worth anything, the only kind that convinces us that its conclusion is true, and the only kind that we can use to convince others that its conclusion is true.

If an argument has nothing but clear terms, true premises, and valid logic, its conclusion must be true. If any one or more of these three things is lacking, we do not know whether the conclusion is true or false. It is uncertain.

If the terms are	and the premises are	and the logic is	then the conclusion is
Clear Clear Clear Clear	true true	valid	true uncertain .
Unclear Unclear Unclear	false false	invalid	, uncertain
	true true	valid	uncertain
	false	invalid	uncertain
		valid	uncertain
		invalid	uncertain
		valid	

(See also p. 194 for more on the relation between truth and validity.)

Logic gives us rules for deciding when an argument is valid or invalid. It also gives us ways of defining terms so as to make them clear and unambiguous. Unfortunately, logic cannot give us any one way to tell whether any proposition is true. There are many ways of finding truth: sensation, intuition, reasoning, experimentation, authority, experience, etc.

(By the way, "what is truth?" is a very easy question to answer, as we shall see in Chapter VI, Section 2. We all know what the word means: it means knowing or saying what is. Aristotle defined truth in words of one syllable: "If a man says of what is that it is, or of what is not that it is not, he speaks the truth; if he says of what is that it is not, or of what is not that it is, he does not speak the truth." Defining truth is easy, finding it is harder.)

Because there are three acts of the mind and three corresponding logical entities (terms, propositions, and arguments), there are three basic questions we should habitually ask in each of the four basic language arts of reading, writing, listening, and speaking. The more we habitually ask these three questions, of ourselves (when speaking or writing) and of others (when listening or reading), the more critical and logical our thinking is. The questions are:

1. What do you mean? (Define your terms.)
2. What's the point? (What's your conclusion?)
3. Why? (Prove it.)

When you want to make an unanswerable argument, you must be sure of three things:

1. Be sure your terms are clear.
2. Be sure your premises are true.
3. Be sure your logic is valid.

If you fulfill all three conditions, you have proved your conclusion.

If you want to answer someone else's argument, you must find in it one of the three following errors:

1. a term used ambiguously
2. a false premise
3. a logical fallacy, an invalid argument, a conclusion that does not necessarily follow from the premises

If you cannot find any one of these three, you must admit that the conclusion is true. For this is the power of logic: if the terms are unambiguous and the premises are true and the logic is valid, then the conclusion really *is* true and has been proved to be true.

	1ST ACT OF MIND	2ND ACT OF MIND	3RD ACT OF MIND
NAME OF ACT	Understanding	Judging	Reasoning
LOGICAL EXPRESSION	Term	Proposition	Argument (usually syllogism)
LINGUISTIC EXPRESSION	Word or Phrase	Declarative Sentence	Paragraph
EXAMPLE OF EACH	"Man " "Mortal"	"Socrates is a man."	All men are mortal. And Socrates is a man. Thus Socrates is mortal.
STRUCTURAL PARTS	None	Subject Term & Predicate Term	Premises and Conclusion
QUESTION ANSWERED	What it is	Whether it is	Why it is
ASPECT OF REALITY	Essence	Existence	Cause
GOOD WHEN	Clear or unambiguous	True	Valid

HOW ACHIEVED	Definition of terms	No one way	Rules of Logic
BAD WHEN	Unclear or ambiguous	False	Invalid
QUESTION TO	What do you mean? (Define your terms.)	What is your point? (State your conclusion.)	Why? (Prove it.)

I: The First Act of the Mind: Understanding

Section 1. Understanding: the thing that distinguishes man from both beast and computer (P)

(This section is more philosophical than logical, but it is important because it fleshes out the positive alternative to nominalism and provides the essential philosophical foundation for Aristotelian logic.)

As we have already reported, a new species of human has appeared: one that does not know the difference between a human mind and a computer, between "natural intelligence" and "artificial intelligence." Some of these people even teach philosophy!

For centuries there have also been some people - many of them philosophers - who say they do not know what the difference is between a human being and an ape. After all, apes seem to reason quite well sometimes. If you put an ape in a pit with a dozen wooden crates, he might figure out how to get out by piling up the crates against a wall in the form of a stairway, whereas some humans would not figure that out.

But there is one simple, observable behavior that clearly distinguishes humans from both computers and animals: asking questions. Computers never question their programming (unless they have been programmed to do so); computers never disobey. They have no will, therefore no will to know. And animals, though curious, cannot ask formulated questions; their language is too primitive.

There is a story that Aristotle, after one of his lectures, was disappointed that his students had no questions afterwards, so he said, "My lecture was about levels of intelligence in the universe, and I distinguished three such levels: gods, men, and brutes. Men are distinguished from both gods and brutes by questioning, for the gods know too much to ask questions and the brutes know too little. So if you have no questions, shall I congratulate you for having risen to the level of the gods, or insult you for having sunk to the level of the brutes?"

Logic specializes in questioning. The three most basic questions humans

ask are: What, Whether, and Why, i.e. What is it? Is it? and Why is it? These are dealt with in the three parts of logic.

The part that most clearly distinguishes humans from computers is the first: understanding a "what," an "essence," the nature of a thing. Computers understand *nothing*; they merely store, process, relate, and regurgitate data. You don't really think there is a little spirit somewhere inside your hand-held calculator, do you? But the world's most complex computer has nothing qualitatively more in it than that, only quantitatively more. An *amoeba* is closer to understanding than a computer, for it has some rudimentary sensation of feeling (e.g. it detects food).

A baby often goes around pointing to everything he sees, asking "What's that?" The baby is a philosopher. "What's that" is philosophy's first question. (Look at any Socratic dialogue to see that.)

The act of understanding, or "simple apprehension" as it is technically called, produces in our minds a *concept*. (Sometimes we use the word "idea" as synonymous with "concept," but at other times we use the word "idea" more broadly, to include judgments and arguments as well as concepts.)

We do not merely understand *concepts*, we understand *reality* by means of concepts. Our concept of a house is our means of understanding the real house. The real house is physical, but our concept is not. The house is independent of our mind, but the concept of it is not: it is in our mind. If all we understood was our own concepts, we would not understand objective reality.

Concepts are amazing things. They can do what no material thing in the universe can do. They can transcend space and time. No body can be in two places

1 The use of the traditional inclusive generic pronoun "he" is a decision of language, not of gender justice. There are only six alternatives. (1) We could use the grammatically misleading and numerically incorrect "they." But when we say "one baby was healthier than the others because they didn't drink that milk," we do not know whether the antecedent of "they" is "one" or "others," so we don't know whether to give or take away the milk. Such language codes could be dangerous to baby's health. (2) Another alternative is the politically intrusive "in-your-face" generic "she," which I would probably use if I were an angry, politically intrusive, in-your-face woman, but I am not any of those things. (3) Changing "he" to "he or she" refutes itself in such comically clumsy and ugly revisions as the following: "What does it profit a man or woman if he or she gains the whole world but loses his or her own soul? Or what shall a man or woman give in exchange for his or her soul?" The answer is: he or she will give up his or her linguistic sanity. (4) We could also be both intrusive and clumsy by saying "she or he." (5) Or we could use the neuter "it," which is both dehumanizing and inaccurate. (6) Or we could combine all the linguistic garbage together and use "she or he or it," which, abbreviated, would sound like "sh . . . it."

I believe in the equal intelligence and value of women, but not in the intelligence or value of "political correctness," linguistic ugliness, grammatical inaccuracy, conceptual confusion, or dehumanizing pronouns.

at the same time, but a concept can. Suppose someone asks you whether you think San Francisco or Boston is a more beautiful city. You understand the question, and you answer it.

Your mind compared (and therefore was present to) two cities 3000 miles apart - at once!

Your concepts did what your body cannot do. Though your body is unimaginably tiny compared with the universe, your concept of the universe is greater than the universe! For if you understood the word "universe," your thought 'surrounded' the universe - the same universe

that surrounds your body. You did that by having a *concept* of the universe.

Concepts have at least five characteristics that material things do not have. They are spiritual (or immaterial), abstract, universal, necessary, and unchanging.

1. **Concepts are spiritual (immaterial, non-material).** Compare the concept of an apple with an apple. The apple has size, weight, mass, color, kinetic energy, molecules, shape, and takes up space. The concept does not. It is "in" your mind, not your body. It is not in your brain, for your brain is part of your body. It has no size, so it cannot fit there. (If you say that it does have size, the size of an apple, then you must say that your brain must get as big as an elephant when you think of an elephant.) It has no weight, for when you stand on a scale and suddenly think the concept "tree," you do not gain the slightest amount of weight.

In contrast to the *concept* "apple," the *word* "apple" is just as physical as an apple. It takes up space on the page, and it is made of molecules. The spoken word also is made of molecules: wave-vibrations of sound of a certain size and shape. But between these two material things - the apple and the word "apple"

- there is the concept. That is the only reason why we can use the word "apple" to mean the physical apple we eat. We use one physical thing (the word "apple") as a symbol of another physical thing (the apple we eat), and that mental act, or mental relation, that we set up, is not a third physical thing. It is a concept, and its *meaning* is the real apple even though its *being* is not the being of an apple. (It is not in space, has no molecules, etc.) The concept's *meaning* is "a physical fruit that grows on apple trees, has red or green skin, etc.," but the concept's *being* is not physical (material), but spiritual (immaterial).

Our having the concept of an apple is dependent on our having a physical body, of course: it is dependent both on the eye, which perceives the apple, and on the brain, which works whenever we have a concept. If we had never seen an apple, we would never have a concept of one, and if we had no brain we could not think the concept of an apple. But the concept is not just the physical apple or the visible word or even the sense image, which is somewhere between a physical and a spiritual thing. (We will see the difference between a concept and a sense image more clearly in the next few paragraphs.) The sense image is like a scouting report sent out by the intellect. The intellect is like a king who stays in a soul-castle and sends out scouts (the senses) to report to him what's going on in his kingdom. Or, to change the image, the intellect is like a paralytic in a wheelchair who directs a blind man where to push him. (In this image,

the intellect is symbolized, paradoxically, by the physically sighted paralytic and the senses by the blind pusher.) The two are interdependent.

When a thing is known, it acquires a second existence, a mental existence; the *thing* becomes a *thought*. If familiarity did not dull us, we would find this utterly remarkable, unparalleled in all the universe. No galaxy, no physical energy, no cell, no animal can do this; only a mind can give a thing a second life.

Every language speaks of the human mind, or intellect, as doing something more than the (animal) senses do: as going "deeper" or "below the surface" or "penetrating" what is sensed, like an X-ray; as going beyond appearances to reality, beyond *seeing* to *understanding*. (Thus the irony in a blind poet or "seer" like Homer, John Milton, or Helen Keller "seeing" more than sighted people.) Only because we distinguish between appearance and reality do we ask questions. There would be no philosophy and no science without this distinction.

2. Concepts are abstract. The English word "abstract" comes from the Latin *abstraho*, "to draw (*traho*) from {*ab(s)*}" or "to drag out of." Our mind extricates, or separates, something from something else. What is this something?

When we form a concept, we abstract one aspect of a concrete thing from all its other aspects - e.g. the size of a flower (when we measure it), or its color (when we paint it). No one can physically or chemically separate the size from the color, or either one from the whole flower; but anyone can do it mentally.

We can abstract, or mentally separate, adjectives from nouns. Animals simply perceive "green-grass," but even the most primitive men mentally distinguished the green from the grass; and this enabled them to imagine green skin, or red grass, even though they had never seen it. And once they imagined these things, they set about making them, e.g. by dyeing their skin green from the juice of grasses, or painting pictures of red grass with dye made from beet juice. (When he was two, my son made the thrilling discovery that he could make "purple doo-doo" by mixing up blue and red Play-Doh® in the shape of a hot dog.) Technology and art both flow from this human power of abstraction.

The most important act of abstraction is the one by which we abstract the essential from the accidental. By having a concept we can focus on the essence and abstract from the accidents. Some people are reluctant to do this. Their conversation is utterly concrete - and utterly boring. You want to scream at them, "Come to the point!" These people have few friends, for to have friends you must learn to abstract, i.e. select, set apart, or pick out, the things that interest both them and you. Abstraction fosters friendship - a concrete payoff!

Abstractions have received bad press in the modern world. Too bad. The next time you hear someone say "I'm a concrete, practical person, and I hate abstractions," remind them that babies are very concrete - and uncivilized.

Abstract ideas do not move us as much as concrete things do. Intellectuals, who live with abstractions, are often practically ineffective dreamers and rarely "movers and shakers" of men, because men will not usually live and die for abstractions that move only our mind - even stirring abstractions like "liberty,

equality, fraternity" or "democracy" or "freedom" - but for concrete things that move their loves, like their families or their buddies next to them in the trenches.

3. Concepts are universal. Ask a child what he wants and he may answer, "Everything!" He has formed a universal concept. (Most concepts are only relatively universal, not absolutely universal like "everything" or "something" or "being.")

E.g. "tree" is a universal concept because it is a concept of not only that one tree in your yard, but of all trees. "Beauty" is a universal concept, and when we judge whether San Francisco or Boston is more beautiful, we judge both cities by the universal concept "beauty" (or "beautiful city").

The literal meaning of "universal" is "one with respect to many" (*unum versus alia*). This means that a concept, while remaining one - one essence, one meaning - nevertheless is true of many things, predicable (sayable) of many things, applicable to many things. This oak and that oak and that maple are all "trees." We can truly apply the concept "tree" to any and every possible and actual tree that ever was, is, or will be.

The concept signifies something common to many different things. This oak and that oak are different in size, and oaks and maples are different in shape of leaves and taste of sap, but all are trees. All share the same common essence, or essential nature. That is what we are seeking to know when we ask "*What is that?*"

Only the concept gets at this one-in-many, this common essence in many different things. It is not in sense perception that we see this universal. We perceive only individual men and women, who are either tall or short, either old or young, but "human being" is neither male nor female, neither tall nor short, neither old nor young. "Human nature" does not *look* male or female, tall or short, old or young. It does not "look" at all; it "means." Appearances are particular; but essences, or meanings, or the natures of things, are universal. You cannot touch them or feel them; you can only understand them. They are known by concepts.

Section 3. The "problem of universals" (P)

The fact that most terms are universal (predicable of many things) has given rise to one of the classic problems in the history of philosophy, the so-called "problem of universals." First raised by the ancient Greek logician Porphyry, the problem arises when we ask this question: What is there in reality that universal terms refer to - especially *abstract* universal terms like "beauty" or "humanity"? It is clear that concrete singular terms like "Socrates" or "the moon" refer to concrete individual entities that exist in a particular space and time; but where

and when do we find beauty or humanity, as distinct from this beautiful thing or that human being?

We have said that terms express concepts, that concepts are universal, and that concepts refer to the *essences* or *natures* of things. Are these essences universal, like the concepts we have of them?

If they are not, then it seems that our concepts of them are not accurate, for they do not correspond to their objects. And in that case, our concepts would distort rather than reveal the true nature of things.

But are universals then real things? Is beauty real as well as beautiful things? Does humanity or human nature or the human species really *exist* in addition to the 6+ billion human beings that *have* the same essential human nature?

Plato thought they did. He called these universals "Forms" or "Ideas" - not ideas in minds but Ideas outside minds, objective Truths; not thoughts but the objects of thoughts. He believed there were two kinds of reality, two "worlds": a world of concrete, material individual things in space and time that we know by our bodily senses, and another world of immaterial universal Forms that we know with our minds through concepts.

The "two worlds theory" seems fantastic to common sense and an example of what one philosopher (Alfred North Whitehead) calls "the fallacy of misplaced concreteness," treating an abstracted aspect of a thing (its essential nature) as if it were another concrete thing. This theory of Plato's is sometimes called "Extreme Realism" because it claims that universals are "extremely real," so to speak - just as real as individual things, in fact *more* real since they are timeless and immortal and unchangeable. A beautiful face changes with age, but beauty does not.

The theory most totally opposed to Plato's is called Nominalism. The fourteenth century medieval philosopher William of Ockham is usually credited for inventing the theory, and modern philosophies such as Empiricism, Pragmatism, Marxism, and Positivism have embraced it and made it popular. Nominalism claims that universals are only names (*nomini*) that we use as a kind of shorthand. Instead of giving each individual tree a separate proper name, we group together, for our own convenience, under the one vague name "tree," all those things that resemble each other in certain ways (e.g. having trunks and branches and leaves). But in reality, all trees are different, not the same; not one-in-many ("uni-versal"), but only many.

Nominalism seems logically self-contradictory, for if all trees are different, how can it be true to call them all "trees"? The very sentence that says all trees are *not* really the same presupposes that they are! If universals are only our names for individuals that resemble each other in certain ways, those "certain ways" must be *really universal* (e.g. all have trunks, branches, and leaves); so we have eliminated one universal ("tree") only by appealing to three others ("trunk," "branches," and "leaves"). *Something* in trees must justify our use of a universal

term "tree." What is this? Is it their "resemblance" or "similarity"? But they must resemble each other in *something*. What could this be but their nature, their essence, their treeness, what-trees-really-are?

Aristotle, as usual, takes a middle position between these two extremes, and his view accords best with common sense. His position was developed by the Arabic philosopher Avicenna and by St. Thomas Aquinas in the Middle Ages. It is called "Moderate Realism," and it holds that essences are objectively *real* (contrary to Nominalism) but not real *things* (contrary to Extreme Realism). They are the essential "forms" or natures of things. Forms exist in the world only in individual material things, but they exist in our minds as universal concepts when our minds abstract them from things. It is the very same nature (e.g. humanness) that exists in both states; otherwise our concept of it would not be accurate, would not be a concept of *it*, of what really is in the things. A universal form such as humanness exists in the world only individually, but the same form or nature exists in the mind universally, by "abstraction" from individuals.

So according to Aristotle the Nominalist is right to say that universality is only in the mind, not in things, but wrong to say that there is nothing in reality that is the object of universal concepts. And the Extreme Realist is right to affirm that universals are objectively real and not just names, but wrong to think they are "substances." (Aristotle's technical term for concrete individual things was "substances.") They are the "forms" of substances (e.g. the treeness of trees, the humanness of humans, the beauty of beautiful things, the redness of red things). Some are *essential* forms (like "humanness") which a thing must have in order to be what it is, others are *accidental* forms (like "redness") which a thing can gain or lose and still remain what it is, as when a tomato changes from green to red.

This apparently very technical, abstract, logical dispute has great practical consequences. If universals are more real than individuals, then individuals, and human individuals too, are not *primarily* important - a convenient philosophy for totalitarians! And if individual things are less real than universals, then the senses do not reveal anything very important, and only the few "brains" who can think very abstractly are wise. On the other hand, if universals are not real at all, then we have the even more radical consequence of skepticism: reality is an unknowable chaos, and all so-called universal truths are merely subjective and man-made, including all principles of science and ethics.

DISCUSSION ON CONSCIOUSNESS AND COGNITION

(Definition of Consciousness - the mental faculty in living beings which grasps and/or reacts to existence. Or, the faculty which is aware of its surroundings [its environs]).

The Three Levels of Consciousness

1. The primary level is simple sensation or **direct-sense experience** involving one stimulus and one *automatic* response, or reflex, with no attendant memory of the event. This level is shared by all living entities, plant and animal. This is actually a pre-consciousness level as the living entities which possess this faculty only, and none of the additional levels listed below, have no mentality as such. Mentality is a rudimentary nervous system rather than having only the store of data present in protein chains, RNA, and DNA.
2. The second level, that of the **percept**, involves the addition of memory, which does reside in a mentality (a nervous system including a brain). The memory is of two or more connected-sense-experiences (several discrete beams of light, several discrete waves of sound, several discrete quantities of pressure, and so on; acting on an appropriately receptive sense organ) that form an *automatic* unit of cognition or impression such as sight, hearing, touch, taste, or smell.
 - a. The perceptual faculty characteristically leads to the *awareness of things or entities*. All things that are perceived have *concrete existence* (exist in the physical universe - the realm of extension) rather than *abstract existence* (exist only in *human* consciousness as an idea which does not have the quality of extension). The perceptual is an *automatic* function. For example: open your eyes and you see, a noise is made and you cannot help but hear, or a pressure on your body is involuntarily felt, and so on. Because "memory" is a primary constituent of perception, rudimentary learning, or the integration of past experiences (through trial and error), is present at this stage. This level is shared by the so called higher animals with man.
3. The third level is **conceptual**, or forming an abstract idea generalized from the memory of two or more perceptual instances which have been retained in memory as similar in one aspect or another (our ability to identify *universals*). These are the ideas having abstract existence which are mentioned in the previous paragraph. For example: a lily pad in a pond, a frog sitting on it, and other items of foliage in the area are all seen to display the same outer color; so, one aspect in which they have similarity (universality) is green – man pointedly *conceives* of "green or greenness". He forms a *concept* of the color green by connecting it with a symbol (a word) which can be spoken, written, or held as a thought. As a conceptual being can discern universals, he can also distinguish particulars, opposites, corollaries, and contrasts.

Another example: we have observed that the predatory animals, which have been man's companions through his tenure on earth, always have and still do hunt for their food. Man, who previously hunted and gathered exclusively, has, over that period of time, discovered the controlled means to raise his food by having the capacity to establish and act upon the complex concept of "agriculture". A concept is not simply a word, but the corollary *representative* of every thing, attribute, action, and relationship for which it stands. Said another way but in the same sequence, a word/concept is either a noun, adjective, verb, or a prepositional phrase (along with other parts of speech which indicate further details).

The "basic" power in this attribute is to abstractly integrate from percepts, such as fashioning the primary tools of the mind: descriptive word/concepts (e.g., green) without which reasoned *thinking* cannot occur - that is, we identify an observed thing, attribute, etc., etc., with symbols like letters, numbers, hieroglyphs, gestures, organized sounds, and so forth. It must be emphasized that words are used not only for communication, but also for the process of rational thought. Conceptual thinking *requires* words.

The "greater" power is the ability to build other concepts from previously established concepts. In other words, to garner further abstractions from abstractions themselves - such as forming the high level abstraction of "agriculture" as including the lower level constituents of raising food, namely agronomy and animal husbandry. This is the same process in which the higher level concept of "furniture" encompasses the lower level concepts of chairs, tables, beds, etc. Another way this greater power is applied is in connecting concepts to form sentences, sentences to form paragraphs, and paragraphs to form fully integrated literary or mathematical discourses.

Said alternatively, we form a hierarchical thought edifice built upon a foundation of observation (percepts), to the "idea" of connecting those observations with low-level abstract symbols like *words* (concepts), and, lastly, to grammatically combine a number of concepts to form high-level, *complete* thoughts (sentences and propositions).

Through concentrated mental imagery, it is possible for actions and relationships to be modeled *before* they happen. This level requires the exercise of free-will or volitional effort (often a great amount of effort!) . . . it must be focused upon . . . it is *non-automatic*. Conceptual consciousness is pro-active rather than reactive, as are direct-sense and perceptual consciousness'. This "pro-activity" is the engine which propels human development forward at an ever increasing rate.

The conceptual faculty characteristically leads to *self-awareness*, or consciousness of one's own consciousness. The name for humans in the discipline of Anthropology is homo-sapien-sapiens. The 'sapien-sapiens' in the classification refers to 'a being' aware of itself, that is, self-awareness. In some circles this is termed the Fourth Level Consciousness which evolves from the following process: [1] Mineral Consciousness; [2] Vegetable (Plant) Consciousness; [3] Animal and Bicameral Consciousness and, presently, to [4] Self Consciousness. Speculation is that the level yet to come is [5] Unitary/Cosmic Consciousness, or, at times, in the Western Tradition - Christ Consciousness.

(The lack of awareness, differentiation, and definition of these three modes of cognition, especially that of the *conceptual*, is what has led man to virtually all of his confused states of being.)

These are elusive, abstract topics to comprehend. Here are some restatements of what was presented above which might help bring clarification.

Perception (observation; the use of our five instruments of knowledge, our senses), is the *basic* state of human cognition; the memory of several instances of awareness constituting experience and, finally, the ability to learn or associate through memory from experience.

Conception involves thinking or *creating* associations themselves by symbolizing experiences and consolidating or integrating these associations in various novel combinations which have never been experienced as such.

Reason (Rationality): the faculty which integrates our perceptions (data provided by our **senses**) by means of forming conceptions. This raises our knowledge from the perceptual level, which we share with the animals, to the **conceptual** (abstractive) level which we alone have been observed to have attained. The method which reason employs in this process is **the integrated Trivium**.

1. Through sense observation, form concepts and complete propositions from raw data in a discursive or grammatical manner to form a factual body-of-knowledge.
2. Subject that organized, factual body to the rules of logic for the elimination of all contradictions within its content and; thus, yield valid understanding.
3. Test this validity through cogent expression (forceful conviction) to one's self or, better yet, persuade another party as to one's conclusion via the rules of rhetoric.

Since each of these elements is based on the facts of reality, the conclusions reached by a process of reason are objective and consistent with reality; hence, accessible to all men, the *rational animals*.

Finding the root of the concept *rational* - **ratio** - might offer additional clarification. Man is literally the animal that can discern, identify and use *ratios* or proportions. This is the a most concise definition of "man", his reasoning ability, and all this implies. It speaks eloquently to the refined subtlety of which we are capable. The first realization of ratio was in identifying causality - or the Law of Cause and Effect. For every cause there is exactly one effect, for every effect there is exactly one cause . . . this is the Prime Ratio, the ratio of 1:1. From this beginning, observations led to all of the other ratios which we use: the octave and its various divisions in music and astronomy; the ratios of Pi and Phi (the Golden Ratio); the Pythagorean Theorem and Fibbonacci Sequence in science, engineering, and the plastic arts and so on. Birds fly, fish swim, men discover and use ratio.

From the Western, Abrahamic Traditions:

In the time before Eve, when Adam was alone in the Garden of Eden except for the animals and vegetation, God is said to have tested him with a question. "What impressions do you have of your companions in the Garden, Adam?" Adam replied, "I see all about that which is like me, but I see nothing about which is anything like me." The test was successfully answered because Adam recognized the living entities, like himself, all around, but that he was the only entity he could observe which was aware of itself and, by implication, of the great magnitude and proportion of that difference. He had expressed the wider scale of awareness, not only of *kind*, but also of *degree*. Thus, as the story goes, God granted him the company of Eve to help spread this quality in the Garden. This is the quality of Grace, the quality of conceptual thought, that all persons have inherited; and, it is important to add, of which each is free to cultivate and use... or not.

The Three Levels of Cognition

There are three distinctive modes of human cognition:

1. The Mythopoeic Mode (a contraction of mythic and poetic), which is the first development of these modes, uses analogical methods (or, comparisons) in attempting to illuminate phenomena. For example, an earthquake had been said to be caused by the anger of a super-natural god/being like Neptune. Anger and earthquake are compared as signifying tumult in a well plotted, narrative story which, in the final analysis, is a human mental construct -- a fiction -- a fantasy. Here, there is no basis for a rational argument or for the advancement of another possibility in explanation. Therefore, the refinements which are focused upon in this mode are those of poetic or literary style rather than in efforts of uncovering truth.
2. The Philosophic Mode, developed next, dispensed with extraneous entities and motivations. It makes observations of the phenomenon itself through the filter of logic (to methodically detect and eliminate *propositional* contradictions). Thales of Miletus, the ancient Greek 'Father of Western Philosophy', proposed that an earthquake was the last event in a chain of natural occurrences; that the immediately preceding link was the violent disruption of the surface of the earthly ocean which was itself effected by the agitation of the larger cosmic ocean. This was an erroneous explanation, but it tried to delimit itself to the observable, natural world rather than involving the fantasies of an additional super-natural dimension. The value here is in the consistent manner in which a phenomenon is explained within the natural, knowable realm itself (that which is apparent to our five senses). If an error is present, as it is in the given example, a correction is possible by repeatedly applying the principles of the trivium, and particularly rules of logic, as a greater amount of knowledge -- gained over time -- is focused upon the question of truth.
3. The Scientific Mode, the latest development, uses physical demonstration; that is, controlled experimentation in explaining phenomena. The aim of a controlled experiment is the successful practical demonstration in the execution of a statement of theory. If the full understanding of Nature is not present, or if there is an error in that theoretical statement, the designed experiment will not go to completion and the statement will have remained a hypothetical one. If the understanding is sufficient and; therefore true, any number of such experiments will go to completion and all witnesses to the events will have perceived exactly the same actions and relationships in the process of those completed cycles. The proof of a successful scientific demonstration is self-evident, in other words, to **all** observers; as are the geometric shapes of a circle, a square, and a triangle to all human observers with unimpaired physical senses.

In the authorship of a scientific theory, which has been successfully demonstrated by experiment, the qualifications and quantification necessary for that demonstration will be included in the theoretical statement of explanation. As time has progressed into the more modern era, a sufficient amount of quantifiable data has been discovered about the pertinent conditions for producing the effects of an earthquake. The discovery is that very specific volcanic and/or geological conditions (not hydrodynamic conditions as Thales had assumed) in very specific geographical locations, will produce earthquakes. These may be influenced by the gravitational effects of the Moon, but enough information along those lines has not yet been analyzed. Rather than being a controlled experiment, a natural earthquake possesses all of the quantifiable criteria that has been gathered over time, and can be accurately correlated after the fact. The point to be made here is that both earthquakes and successful experiments are objective events which are perceivable to all witnesses in like fashion. Discoveries of the laws of objective nature and demonstrations of those laws in objective nature are what form the discipline of delineation in the scientific mode.

The following is an excerpt from another letter which may better clarify **The Seven Liberal Arts & Sciences**. *Liberal* is used here not in the modern, but in the classical sense: it is literally - liberating or setting individual minds free from ignorance through the understanding of reality. As regards contemporary society, this understanding would liberate us *from* task masters of all sorts - despots in schools and in the workplace; unscrupulous professionals; and self-serving propagandists in government, media, and advertising - by giving us the freedom *to* competently explore reality for ourselves. *Refer to Jan's definition of liberal.*

DISCUSSION ON GRAMMAR - Primary Organization of Thoughts

GRAMMAR - not only the rules developed and applied to the ordering of word/concepts for verbal expression and communication in the form of a sentence, but our first contact with thinking systematically about reality. Put simply, this is the initial, self-conscious technique used in properly (that is, discursively and sequentially) organizing factual data into a coherent body of knowledge on a particular subject. This includes a broader definition of grammar which targets any and all topics, not only that of language.

Grammar usually connotes the rules of language to express thought. This suggests the *primacy of language* in grammar. It is called "special grammar" which properly relates words to other words within a particular language like English, German, or Latin. The grammar to be described is intended to establish the *primacy of thought*; that is, using grammar to initially organize our thoughts. This is called "general grammar" which properly relates thought to reality or to that which exists (these are the primary rules of existence as processed by humans).

Single words by themselves have no meaning beyond what they denote. A word is not a complete thought. "Slow", "green", "above", "bird", only point out phenomena like actions, attributes, relations, and things - they are not complete thoughts. A sentence, a series of words containing a subject and a predicate, is the first representation of a *complete thought* which has meaning.

At times, a thought needs more than a word representing a thing (a substantive - noun or pronoun), and another word stating something about the subject upon which the thought is predicated (a verb), but also a word or words standing for something to complete the thought, something which completes the meaning of the predicate, a complement or an object. (Note the spelling of *compl-e-ment* which refers to being completed. It is different from the more commonly used term referring to admiration, spelled *compl-i-ment*.) This is the basic structure of conceptual thought: subject, predicate, and complement; or subject, verb, and object. In so called progressive schools, this is stated as a thing (a substantive) which performs an action or describes a state of being (a verb) upon another thing which is acted upon (an object, which is also a substantive). Grammar can be used for efficiently organizing a number of such similar basic thoughts into a more complex composition for subjection to analysis and/or synthesis (these last two concepts will be discussed in #3 - On Logic). The type of sentence which declares something - something which can be affirmed or denied - is the one which will be discussed. Sentences which ask questions, state commands, or make an exclamation cannot be subject to opinion (i.e., affirmed or denied). Declarative sentences are the only ones which can be called *propositions*. A series of simple propositions and propositional arguments constitute complete, integrated bodies of knowledge; or, they can stand and be judged on their own.

Example - Definition / Sentence

Existence is every *substance, action, attribute, and relationship* that is, was, or ever will be.

Concepts of Existence:

1. **Substance**- a person, a place, or any substantial *thing* perceived through the five
2. "Instruments of Knowledge"; the five senses: **Pronouns and Nouns**

3. **Action**- those things that nouns do, as in motion or states of being: **and Verbs**
4. **Attribute**- property of an entity like color, dimension, quantity or quality of force, traits of life/sentience, etc.: **Adjectives** (noun modifiers) and **Adverbs** (verb modifiers)
5. **Relationship**- comparisons among existents, usually spatial and/or temporal:
6. **Prepositions** - *Words* which connect other words to show the
7. relationship among the things those words represent.
8. The words ***or, and, but, etc.***, are words and concepts to show relationships among *thoughts* and are used for unit economy in communication: **Conjunctions**

Concepts of Consciousness:

These are seven of the nine essential components in the study of grammar, presented in the logical order, if not the chronological order, in which they were probably developed for expression and communication. The other two are articles (*a* or *an* and *the*) placed before a noun to show whether it is general or particular, and exclamatory interjections (words which can stand alone as a sentence, like - *Wow!* or *Yea!*). All other grammatical structures are details within them.

The words as used are not necessarily the identifying parts of speech in the example-definitional sentence, but it is meant to illustrate that the order in grammar refers to items and events in reality; to the universe around us and not just to some arbitrary rules of mere writing or speech as prescribed by *authorities or social conventions* such as was unsuccessfully attempted when the rules of Latin were applied to English? This is the way the human mind begins to interact with its environment, its surrounding natural existence, in its uniquely conceptual capacity.

(General) Grammar, as mentioned initially, can be applied to all subjects and propositions, not just those that deal with language. The data comprising any topic can be ordered by defining what is acting or relating, the subject ([pro-]nouns and modifiers); the names of the actions or relationships themselves (verbs / prepositions and modifiers); and that which is being acted upon or related to - the object. This primary-level organization is now ready to be understood (scrutinized or proven) by subjection to the rules of logic. In logic, for example, entire phrases or sometimes paragraphs within a proposition need be identified as subject, predicate, and complement (technically this is termed "subject" and "*theme*") so as to be analyzed deductively (see #3, On Logic).

SUMMARY

The work of grammar is to identify, gather, and discursively arrange raw, factual data of a similar nature into a specific body-of-knowledge. Alternatively stated, the work of grammar is to convert raw data into coherent information.

The effect of grammar is to produce primary, or first-order, knowledge of a subject.

