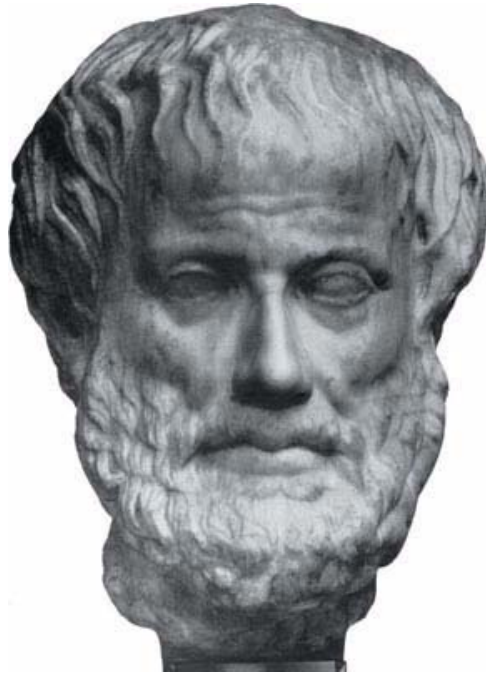




Highlights of Ancient Greek Philosophy

by Khan Amore

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Aristotle (384 -322 B.C.)

A Greek philosopher, born in Stagira (a.k.a. Stagirus), a Greek colony a few miles from Mount Athos on the Macedonian peninsula of Chalcidice, **Aristotle** is (along with **Plato**) regarded as one of the two most influential philosophers in Western thought. As **Socrates** taught **Plato**, so **Plato** taught **Aristotle**, and the three of them together are responsible for the state of Western philosophy as we know it. And because **Aristotle** was in turn the teacher of **Alexander the Great**, and it was he who instilled the love of Greek wisdom into the young Macedonian conqueror, it may be said that Aristotle helped to catalyze **Alexander's** spread of Hellenistic (Greek) civilization throughout the world. Although Aristotle always considered himself a Platonist, and venerated his master, he nevertheless differed from **Plato** on many points. Whereas Plato was an idealist who believed that all that we perceive through the senses is but an imperfect representation of the perfect and eternal *ideas* which underlie them — and sensory data is thus to be discounted — **Aristotle** held that what we know of the world must begin not with abstract ideas, but with what we perceive through our senses (an approach known as *empiricism*.) This philosophical approach to the acquisition of knowledge is of course

the epistemology behind the *scientific method* which is still used by scientists today, so Aristotle may be said to be the *Father of the Scientific Method*. Aristotle dedicated his life to accumulating a vast collection of facts and observations which — despite the inclusion of many errors — amounted to the beginnings of Physical Science. Insofar as Aristotle's method was experimental and inductive, he was in harmony with modern science, and indeed it may be said that *Aristotle laid the foundation of modern science*. Perhaps his greatest contribution to human civilization, though, was *Aristotelian Logic*, for it was he that first formulated the science of *Logic*, and the fundamental laws of reasoning laid down by him have not been amended or improved since he set them forth. Aristotle's most fundamental laws of reasoning are: 1) *the law of identity*, that A is always the same as A; 2) *the law of contradiction*, that A cannot be both B and not-B; and 3) *the law of the excluded middle*, that A must be either B or not-B. Aristotle also brought the logical argument known as the *syllogism* to its full state of development. A *syllogism* is a deductive form of reasoning in which from two given or assumed propositions (called the *premisses*, both of which contain a common, or *middle*, term) a third term (called the *conclusion* — from which the middle term is absent) is deduced. Perhaps the most famous syllogism runs thus:

Every man is mortal.
Socrates is a man.
Therefore, Socrates is mortal.

The power of logic lies in the fact that it enables us to determine whether a given conclusion is true or false *from the form of the argument itself*, without even knowing anything else about the subject. We may never have heard of Socrates, but if the two premisses of the above syllogism are correct (i.e., that every man is mortal; and that Socrates is a man) then we know with complete certainty that the conclusion (i.e., that Socrates is mortal) must also be correct. Syllogisms that are correct in form can only be erroneous if one or more of the premisses is incorrect. Consider the following syllogism:

Every metal is an element.
Bronze is a metal.
Therefore, bronze is an element.

Let us assume that we know nothing whatsoever about chemistry or metallurgy. Logic enables us to evaluate the truth or falsity of the above syllogism, from its form alone. The laws of reasoning assure us that this second syllogism is correct, but — and this is extremely important — *only if both of the premisses are true*. In the given example this is not the case: *Not* every metal is an element, for some are mixtures of two or more metallic elements (such mixtures we call *alloys*) and as it turns out bronze itself is a mixture of the two elements, copper and tin. Therefore, although this syllogism is correct in form, the conclusion is false because one of the premisses is false; but one cannot

know whether or not the premisses are true without special knowledge of the subject matter, and so special knowledge of the subject matter *is* necessary, after all, in order to evaluate whether or not the premisses — and thus the conclusion — of the syllogism are true. Aristotle may have been referring to this weakness of the syllogism when he said:

“Accept one absurdity and the rest follow.”

— Aristotle

He was certainly referring to this requirement of any syllogism whose conclusion is true when he wrote:

“A false [argument] depends on the first false statement in it. Every syllogism is made out of two or more premisses. If then the false conclusion is drawn from two premisses, one or both of them must be false: for (as was proved) a false syllogism cannot be drawn from true premisses.”

— Aristotle, *Prior Analytics*

This inherent “weakness” of the syllogism can actually become a *strength*, though, for we can use syllogisms to test the truth of premisses by observing whether or not the conclusions that they inescapably lead to are true or not — which is the mechanism behind **Zeno of Elea**’s form of logical argument known as the *Reductio ad Absurdum*. The *Reductio ad Absurdum* proceeds thus: 1) the truth of premiss X inescapably implies conclusion Y; 2) conclusion Y is clearly impossible; therefore, 3) premiss X cannot possibly be true. The work in which this last quote from Aristotle appears, *Prior Analytics*, along with its companion works, *Posterior Analytics*, *Categories*, *On Interpretation*, *Topics*, and *On Sophistical Refutations* together make up the first known primer of logical reasoning, (known collectively as *Organon* — the collection of Aristotle’s logical treatises) and it is for this reason that Aristotle may rightly be called *the Father of Logic*. Although Aristotle used both *inductive* reasoning (i.e., inferring general laws from particular instances) and *deductive* reasoning (i.e., inferring particulars from general laws), he clearly preferred the deductive approach of his master, **Plato**. But it is because he wrote the first primer on how to reason correctly, that Aristotle is recognized as *the founder of the science of Logic*. What is even more remarkable is that he was also Logic’s perfecter. It has been said that since the time of this Greek sage the laws of correct reasoning have made no further progress, and the science of Logic that we have today is almost exactly as he gave it to us.

As to his beginnings, Aristotle was born in a small Greek settlement in Thrace. His father, **Nicomachus**, was physician to **Philip of Macedon**’s father, **Amyntas II** (the grandfather of **Alexander the Great**). Aristotle’s father probably tutored him in anatomy and in the medical empiricism of **Hippocrates** — for medicine had for generations been the family profession, passing from father to son — but in his seventeenth year Aristotle was sent to **Plato’s Academy**, where he studied for twenty

years. There the two rival strains in the history of thought — the mystical and the empirical — met and warred in the conjunction of the two philosophers. The physician's son in him struggled with the pupil of the puritanical *metaphysician*, and neither side won — Aristotle never quite resolved the conflict. He gathered enough scientific observations to fill an encyclopedia and then tried to force them into the Platonistic mold in which his scholastic mind had been formed, but found himself forced to refute his venerated master at every turn, causing him to utter the famous lament:

“Plato is dear to me, but dearer still is Truth.”

— Aristotle

As a youth, Aristotle was an earnest student, and soon caught the eye of his master. According to Diogenes Laertius, when Plato read at the Academy his soporific treatise on the soul, Aristotle was the only auditor who sat it out, while all the rest “rose and went away.” This alone must have been enough to endear Aristotle to his master. It was only when Plato died (in 347 B.C.) that Aristotle finally left the Academy, but before he left he built an altar to Plato and gave him almost divine honors. It would seem that Aristotle had loved Plato even if he could not agree with him. Accompanied by **Xenocrates** (another of Plato's disciples), Aristotle then went to the court of **Hermeias**, who had studied with him at the Academy, and who had raised himself from slavery to become the dictator of Atarneus and Assus in upper Asia Minor. There Aristotle married Hermeias' niece and adopted daughter, **Pythias** (in 344 B.C.). The couple was about to settle in Assus when Hermeias was assassinated by the Persians, who suspected him of planning to help in **Philip of Macedon's** proposed invasion of Asia, and so Aristotle fled with his bride to the nearby island of Lesbos. There Aristotle devoted himself to studying the natural history of the island, and to the joys of wedded bliss until Pythias died after giving him a daughter. Although Aristotle later married — or at least lived with — the hetaera, Herpyllis, he maintained to the end of his life a tender devotion to the memory of Pythias, and at his death asked that his bones be laid beside hers. (It would seem that he was not the emotionless bookworm that one might picture from his works.) In 343 B.C. **Philip of Macedon**, who had probably known him as a youth in the court of his father, **Amyntas**, invited Aristotle to undertake the education of his (Philip's) son **Alexander**, then a wild lad of thirteen. Accepting the invitation, Aristotle went to Pella, where he labored at the task for four years. In 340 B.C. Philip commissioned Aristotle to direct the restoration and repopulation of Aristotle's home town, Stagirus, which had been laid to waste in the war with Olynthus, and to draw up codes of law for it. These tasks he accomplished well enough that the satisfied city commemorated its re-establishment by him with an annual holiday, and the experience led him to a lifelong comparative study of constitutions and systems of government. To him, every constitution was a social experiment which had been conducted, but which no one had bothered to comparatively analyze the results of, to see which systems of government worked well, which did not, and *why*. In 334 B.C. the fifty-year-old Aristotle returned to Athens and — probably

aided by funds from **Alexander**, who had just set out upon his Asiatic conquests — opened a school of rhetoric and philosophy. For its site he chose the most elegant of the Athenian gymnasiums, a group of buildings dedicated to *Apollo Lyceus* (god of the shepherds), surrounded with shady gardens and covered walkways. In the morning he taught advanced subjects to regular students, and in the afternoon he lectured to a more popular audience, probably on rhetoric, poetry, ethics, and politics. He collected there a large library, a zoological garden, and what we would today call a museum of natural history. The school came to be known as the *Lyceum*, and the group of scholars as well as that group's philosophy were named *peripatetic* from the covered walks (*peripatoi*) through which Aristotle liked to stroll (*peripateo*) with his students as he discoursed. A rivalry developed between the *Lyceum* (whose students were mostly of the middle class), the *Academy* (which drew its membership largely from the aristocracy), and the school of **Isocrates** (which was frequented chiefly by colonial Greeks). The competition between these schools was moderated by the emphasis of **Isocrates** on rhetoric, of the *Academy* on mathematics, metaphysics and politics, and of the *Lyceum* on natural science. Aristotle set his pupils to gathering and coordinating knowledge in every field: the customs of the barbarians, the constitutions of the Greek cities, the chronologies of victors in the Pythian games and the Athenian Dionysia, the organs and habits of animals, the character and distribution of plants, and the history of science and philosophy. As Will Durant put it, these researches became a treasury of data upon which he drew, sometimes too confidently, for his varied and innumerable treatises. For the layman Aristotle wrote 27 popular dialogues, which **Cicero** and **Quintilian** considered equal to Plato's, and indeed it was by these that Aristotle was known in antiquity. Unfortunately, these dialogues are lost. What remains to us of Aristotle's work is a mass of technical, at times bombastic, verbiage. Unlike **Isocrates**, who stressed style over substance, Aristotle evidently thought that what he was saying was more important than the way he was saying it, for he refused to sacrifice precision of expression for elegance of expression. In consequence, Aristotle's style of writing tended to be almost unreadably dull. Aristotle may have recognized this shortcoming for, perhaps in an attempt to compensate for this conspicuous lack of eloquence in his work he resorted instead to grandiloquence. Aristotle's works which remain to us were intended mainly for consumption by scholars, and are about as tedious for the layman as reading Ph.D. theses today — they are didactic treatises, not literary works. These were rarely referred to by ancient scholars, and were apparently composed in the last twelve years of Aristotle's life, from notes made *for* his lectures by himself, or *from* his lectures by his pupils. These technical compendiums were not known outside the *Lyceum* until they were "published" (i.e., allowed to be hand-copied) by Andronicus of Rhodes in the 1st Century B.C. Forty of them survive, but Diogenes Laertius mentioned 360 more — probably brief monographs. In view of the fact that Aristotle's remaining works were meant to be read by scholars, not laymen, perhaps the great Philosopher may be forgiven for his occasional stylistic lapse into high-faluting professorial pomp. As Will Durant put it, "In these ashes we must seek the once living thought that in later ages won for Aristotle the

title of ‘*The Philosopher*.’ We must approach him expecting no brilliance like **Plato**’s and no wit like **Diogenes**’, but rather a rich argosy of knowledge, and such conservative wisdom as befits the friend and pensioner of kings.”

It may be said that both the lives of **Alexander** and **Aristotle** were expressions of conquest and synthesis. Perhaps it was the great philosopher who instilled into the mind of the young conqueror that ardor for unity that gave some grandeur to Alexander’s victories. Whatever the case, we do know that through all his campaigns Alexander carried with him a copy of **Homer**’s *Iliad* annotated by Aristotle; often he placed it under his pillow at night beside his dagger, as if to symbolize the goal and the instrument by which that goal is to be achieved. Aristotle formed Alexander’s mind and Hellenized the conqueror who then, in turn, Hellenized the world. Alexander had a passion for reading and learning which only increased with time, and, possibly at Aristotle’s suggestion, Alexander sent a commission to explore the sources of the Nile, and generously gave funds for a variety of scientific inquiries. According to **Pliny**, Alexander even went so far as to give orders to his hunters, gamekeepers, fishermen and others to supply Aristotle with whatever species and information he might request. Apologizing for his interest in lowly life-forms, Aristotle said, “In all natural objects there lies some marvel, and if anyone despises the contemplation of the lower animals, he must despise himself.” Aristotle may even have played an indirect role in setting the intellectual course of that great center of world learning, *Alexandria, Egypt*, for Alexander’s general **Ptolemy Lagus** — who must have gotten the “bug” from Alexander — became the enlightened ruler of Egypt after Alexander’s death, and made his capital, Alexandria, the think-tank of the world. Aristotle’s influence on Alexander was clearly beneficial to the world and so it is unfortunate that, before their deaths, the philosopher and the conqueror had a falling-out. It seems Aristotle’s nephew, **Callisthenes** accompanied Alexander’s expedition as official historian, and when Alexander, near the end of his career, threw Callisthenes into prison for insolence and conspiracy (where he died seven months later) this brought to an end the friendship between Alexander and Aristotle. The fact that supreme power eventually led Alexander to turn on his friends must have left the great conqueror unloved in his final days, for as Aristotle put it:

“No one loves the man whom he fears.”

— Aristotle

The year 322 B.C. saw the deaths of **Demosthenes**, **Diogenes**, and **Aristotle**. Aristotle had long been unpopular in Athens, for the *Academy* and the school of Isocrates disliked him as a critic and a rival, while the Athenian patriots looked upon him as a leader of the pro-Macedonian party, due to his erstwhile close association with Alexander. When Alexander died (in June of 323 B.C.) Aristotle’s foes took advantage of the situation to bring an accusation of impiety against Aristotle. Heretical passages of his books were brought as evidence of his impiety (for Aristotle, like **Epicurus**, sought to replace

Religion with a natural ethic), and these were bolstered by the charge that he had offered divine honors to the dictator, Hermeias, who, having been a slave, could not have been a god. These persecutions must have been thoroughly depressing, but depression (called *melancholia* in former times) was not regarded as a mental illness in those days, but was considered a natural reaction to lamentable circumstances. Moreover, because it was the result of a willingness to face adversity and to accept unpleasant truths — instead of living in denial of these truths — depression was even regarded as an accompaniment to greatness:

“Great men are always of a nature originally melancholy.”

— Aristotle

And because depression can most reliably be escaped by immersing oneself in creative work, depression often *drives* creativity, and hence genius. Another way in which Aristotle may have softened his melancholia was by accepting it as part of the price of being a man who dares to look upon unpleasant truths, and to be honest with himself about what he sees — in other words, the *acceptance* of depression itself as something natural under the given circumstances takes much of the venom out of it. But Aristotle also seems to have regarded *humor* to be an essential complement to depression, judging from his statement that:

“Melancholy men are of all others the most witty.”

— Aristotle

And just how did Aristotle define wit?

“Wit is educated insolence.”

— Aristotle

We picture a perhaps insolent Aristotle in his final days, with critics, rivals, and prosecutors closing in on him after Alexander’s death. Just as lightning always strikes the highest points, so malicious human envy drives men to delight in bringing low those who tower above them. Well, after the death of the great conqueror, *Aristotle* was the highest left standing in Athens, and so in this sense Aristotle’s greatness was indeed directly linked with the depressing circumstances he found himself in, when the Athenians clamored to bring him down. Aristotle quietly left the city, saying that he would not give Athens a chance to sin a second time against philosophy. [Aristotle was referring, of course, to the execution of **Socrates** by the Athenians, for impiety.] He withdrew into the exile of the home of his mother’s family in Chalcis, leaving the *Lyceum* in the care of **Theophrastus**. The Athenians passed sentence of death upon him *in absentia*, as they had with **Anaxagoras**, but had neither the need nor the opportunity to

execute it, for either through a stomach illness aggravated by his flight, or, as some say, by taking poison, Aristotle died of his own accord a few months after leaving Athens, in his 63rd year.

Before getting into the details and criticisms of Aristotle's philosophy, and his impact on history, it might be well to offer a side light which might serve to illuminate how Aristotle's works have come down to us. Aristotle's successor, **Theophrastus**, was also a great scientist who studied plants as closely as Aristotle had studied animals — although both of these inquisitive men did seminal work in *many* fields. Theophrastus (who wrote 400 volumes dealing with almost every subject from love to war, and who more fully developed the field of *Botany*, which **Aristotle** had begun) was a worthy successor as head of the *Lyceum*, so worthy, in fact, that if there had been no Aristotle, his period in history might well have been called *the time of Theophrastus*. But the patterns of history repeat, and that political tool known as "Religion" again reared its ugly head, and Theophrastus suffered from murderous religious intolerance just as **Anaxagoras**, **Socrates**, and **Aristotle** had. In 307 B.C. the Athenian state issued a decree requiring the Assembly's approval in the selection of leaders for the philosophical schools. At about the same time, Theophrastus was indicted on the old faithful charge of *impiety*, prompting Aristotle's successor to leave Athens just as Aristotle (and Anaxagoras) had been forced to do. So many of his students followed him that shopkeepers complained of a ruinous fall in trade. Within a year the decree was annulled, the indictment withdrawn, and Theophrastus returned in triumph to preside over the *Lyceum* until his death at the age of eighty-five. The *Peripatetic* School did not long survive him and science left impoverished Athens for affluent Alexandria, Egypt, and the *Lyceum*, which had dedicated itself to research, subsided into penurious obscurity. Fortunately, Aristotle's books fared better. Owing to the scarcity of books (each of which had to be hand-written and hand-copied) there were no Greek libraries until those collected by **Polycrates** [see the Amazing Story of Amasis and Polycrates] and **Peisistratus** in the Sixth Century B.C. In the Fifth Century B.C. we hear of the private libraries of the playwright, **Euripides**, and the archon, **Eucleides** — and of course, we know of no *public* library before the Great Library of Alexandria — but in the Fourth Century B.C. Aristotle amassed the first really extensive private collection of books, four hundred of which he had authored. When Aristotle was driven from Athens he bequeathed his books to **Theophrastus**, who in turn bequeathed them (in 287 B.C.) to Neleus, who took them to Scepsis in Asia Minor, where they were buried, says tradition, in order to escape the literary cupidity of the Pergamene kings. After almost a century of this damaging internment the volumes were sold around 100 B.C. to Apellicon of Teos, an Athenian philosopher. Apellicon found that many passages had been eaten away by the damp, so he made new copies, filling in the gaps as intelligently as he could (this, and subsequent interpolations and translations, may go far to explain why Aristotle's written works are not the most fascinating in history.) When Scylla captured Athens (in 86 B.C.) he appropriated Appellicon's library and transported it to Rome.

There the Rhodian scholar **Andronicus** recorded and published the texts of Aristotle's surviving works — an event almost as stimulating as the re-discovery of Aristotle was to prove in the awakening of medieval philosophy. When what remained of the Alexandrian Library was burned by the Christians, the Alexandrian Museum was shut down for good, and the last Keeper of the Flame of Knowledge — **Hypatia** — was publicly assassinated by a mob of Christian monks at the command of a Saint, the age of Greek wisdom came to an end and the Dark Ages fell upon the world. In the ensuing benighted millennium a few of the pearls of ancient Greek culture survived in Syria, Mesopotamia, and Babylonia, and the classics of Greek science and philosophy were preserved in the Syriac language. After the advent of Islam in the 7th Century A.D., the Moslem Caliphs became intrigued by these ancient Greek treatises, and had them translated into Arabic. Dazzled by the brilliance of the lost Greek culture, prominent Moslem intellectuals (such as **Al-Mansur**, the Caliph who, in A.D. 762, founded the city of Baghdad) dispatched messengers to Constantinople and other Hellenic cities — even to traditional enemies — asking for Greek books, especially in medicine and mathematics. It was in this way that **Theon** and **Hypatia's** recension of **Euclid's** *Elements* came into Islam. In A.D. 830 the rationalist Caliph, **Al-Mamun** established at Baghdad, at the cost of 200,000 dinars (nearly a million dollars) a “House of Wisdom” (*Bayt al-Hikmah*) as a scientific academy, observatory, and public library. There the ardent admirer of ancient Greek wisdom installed a corps of translators, and paid them from the public treasury. It was to this institution (founded by **Al-Mamun**) that Islam owed its intellectual awakening — that Islamic flowering of science, literature, and art which accompanied the re-discovery of ancient Greece, just as this re-discovery was to do again for European culture when Europe was awakened from its millennium of intellectual stagnation by the *Renaissance*. It is fortunate for the world that while Europe was in its Dark Ages, the Moslem world (whose intellectual center was Baghdad) was in its Renaissance, for it was in this way that the works of **Galen, Plato, Euclid, Claudius Ptolemaeus, Hippocrates, Aristotle** and many others were preserved for us by Moslems through our Dark Ages. For example, it was through its Arabic version that **Theon** and **Hypatia's** recension of **Claudius Ptolemaeus' Almagest** received its name (a name which in Arabic means “the Greatest,” for it was indeed the greatest masterpiece of astronomical science until the time of Kepler and Newton.) Around the time of the first *Crusades* (i.e., the “holy wars” waged by the Christians against the Moslems in an attempt to “recapture” the Holy Lands from them) some Arabic books were brought back to Europe, where they were translated into Latin and copied by Christian monks. Among the ancient Greek books which found their way back to Europe in this way were the works of Aristotle, and Aristotle made such an impression on the monks (who were at the time the only literate people in Europe) that it caused the birth of a theological and philosophical movement known as *Scholasticism*. Dominant from about the middle of the 11th Century A.D. to about the middle of the 15th, Scholasticism attempted to use natural human reason, and in particular, the philosophy, logic, and science of **Aristotle** to try to make sense of the supernatural dogma known as “Christian revelation.” The

ultimate goal of the movement was to integrate into an ordered system both the natural wisdom of Greece and Rome, and the religious faith of Christianity. The term “scholastic”, which originally applied to the heads of the medieval monastic or cathedral schools from which the universities developed, finally came to be applied to anyone teaching philosophy or theology in such schools or universities. The chief concern of the scholastics was not to discover new facts but to integrate the knowledge already acquired separately by Greek Reason and Christian revelation. The underlying assumption was that reason and revelation must ultimately be in harmony if both are true. The scholastics maintained that the same God was the source of both types of knowledge and that Truth was one of His chief attributes, so that He could not contradict Himself in these two ways of speaking to men. The scholastics assumed that any apparent contradiction between revelation and reason could be traced back to either an incorrect use of reason or to an inaccurate interpretation of the words of revelation. However, because the scholastics believed that revelation was the direct teaching of God himself, it possessed for them a higher degree of truth and certitude than reason did. In conflicts between religious faith and philosophical reasoning, faith was thus always the supreme arbiter — the theologian’s decisions overruled those of the philosopher. Throughout the scholastic period philosophy was called the “handmaid of theology”, not only because the truth of philosophy was subordinated to that of theology, but also because the theologian attempted to make sense of revelation using philosophy. The most characteristic feature of the scholastics was their respect for — and indeed abject submission to — authority in both philosophy and theology. The authorities they adopted as infallible were the great philosophers of Greece and Rome — particularly **Aristotle** — and the early Christian “Fathers of the Church” — particularly **Saint Augustine**. On those rare occasions when the scholastics had original thoughts, they always quoted accepted authorities to lend credence to their opinions. Often the appeal to authority was little more than a safeguard designed to show that the scholastic’s views were in continuity with the accepted dogmas of the past and were not mere novelties, for novelty and originality of thought were diligently avoided. After all, in the theocratic millennium when the Church ruled Europe, (i.e., the Medieval period) any original view was likely to be construed as *heresy* — for which a man might end up as the guest of honor at a type of human barbecue known as an *auto-da-fe*. Strangely, the scholastics considered the heathen **Aristotle** to be the infallible authority in philosophy, calling him simply “the Philosopher,” although the Early Christian theologian and Father of the Church, **Saint Augustine** was taken to be a higher authority, subordinate only to the Bible and the official Councils of the Church. Because dogma and violently-enforced orthodoxy were the order of the day when the Church ruled, the scholastics adhered most closely and uncritically to authority in accepting Aristotle’s opinions in the empirical sciences such as physics, astronomy, and biology. Their uncritical acceptance of Aristotle’s scientific views — as yet another article of unquestioning faith — produced a serious weakness in scholasticism, and was one of the principal reasons for its scornful rejection by Renaissance and later scientists. The scholastic movement declined after the middle of the 14th Century, by which time it

had degenerated into a pedantic rigid formalism, in which disputing theologians would attempt to use Aristotelian Logic in the course of lengthy and pompous debates on burning theological issues like how many angels could sit on the head of a pin. Before Aristotle's works were re-introduced to Europe they had been translated from Greek into Syriac and then into Arabic. Interpolations and translation errors inevitably crept in with each re-translation, and at each step the Moslem translators and copyists sought to reconcile Greek philosophy with the *Koran*. At the same time, some apocryphal works were attributed to Aristotle (such as the *Theology of Aristotle*) which were actually the work of Neo-Platonists of the Fifth Century who hoped to legitimize their own attempts at syncretism by fraudulently ascribing their views to the venerated philosopher. It was much the same when Aristotle's works were re-translated into Latin by Christian monks laboring under the ever-present threat of roasting for heresy if their interpretations of the pagan philosopher's works did not prop up their shaky Christian theology. It was likely at this point that Aristotle's (as well as **Plato's**) purported references to "God" (singular and capitalized) crept into the works. Indeed, it would be difficult to tell with certainty which words in his works were Aristotle's own, and which words were the interpolations of later translators and copyists, each having their own points of view to legitimize and promote. When the Dark and Middle Ages gave way to the Renaissance (literally, the *Rebirth* of Classical Greek Wisdom) the still-pious Christians who first dared to make forays into free-thinking became Aristotle's harshest critics, blaming the Greek philosopher for the decline and eradication of rational inquiry, and the supremacy of dogmatism during the Medieval period. One still hears this charge parroted today by Christians who — unwilling to accept the obvious fact that *Christianity* was the cause of the Dark Ages — are eager to blame a heathen for this thousand-year-long period of intellectual stagnation. Aristotle *invented* the tools for rational free-thinking and gave them to the world. He *invented* Logic, and the empirical approach known as the *scientific method*. Is he then to be blamed if these tools, designed to facilitate free-thinking, were used instead to reinforce religious dogma by people who didn't dare to think any thought which was not precisely in line with the dogmas of the theocrats who burned free-thinkers at the stake? No, Aristotle was not the cause of the dogmatism and widespread ignorance of the Medieval period — *religious faith* elevated to an intolerant tyranny was the cause. The abject submission to authority (which is, after all, the basis of *all* religion) was what lobotomized the mind of Medieval man, and no man, no matter how brilliant, should ever be taken as infallible or beyond question, as Aristotle was by the scholastics for whom the only safe form of argument was the *argument from authority*. Even today, it is tempting to dismiss automatically the assertions made by an idiot (a logical fallacy known as an *argumentum ad hominem*) and to accept automatically the assertions made by a respected intelligent person (a logical fallacy known as an *argumentum ad verecundiam*). But the truth or falsity of an argument is unaffected by the intelligence or stupidity of the person making the assertion, for even a fool may now and then be right by chance, and intelligence does not confer infallibility. It is therefore that each proposition must be evaluated on its own merits, without

considering the source. Such a refusal to accept *any* authority — bowing only to reason itself — is the basis of free-thinking, and the source of all progress. Those Medieval monks who elevated Aristotle to just another authority whose *ex cathedra* pronouncements were beyond question — like the Pope's — violated the intent of Aristotle's works, for these works were designed to *free* the mind of man by giving each man the tools to do his own thinking, not to fetter the mind of man with yet another violently-enforced orthodoxy. It is hoped that the writer of this article will be forgiven for this digression, which traces the tortuous way in which Aristotle's works have come down to us — albeit in somewhat adulterated form — and traces also the violent forces of intolerance and orthodoxy which are still at work in the world, ever threatening to crush freedom of thought, to once again lobotomize the mind of man. Having recounted Aristotle's adoption by dogmatic Medieval Scholastics — who subverted the intent of his work, using it in an attempt to prop up their shaky theology — and having offered a rebuttal of the criticism of Christians who are eager to blame the Dark Ages on him (a thousand-year-long period of superstitious ignorance which was clearly caused by the totalitarian tyranny of their own religion), let us now return to the philosophy of Aristotle himself.

Aristotle's most important surviving treatises may be arranged under six headings:

- 1) LOGIC: *Categories, Interpretation, Prior Analytics, Posterior Analytics, Topics, On Sophistical Refutations*. After his death, these logical treatises of Aristotle were collectively given the name *Organon* (meaning “Instrument” of thought — a term which today is taken to refer to any means of reasoning or system of logic) and this collection became *the* textbook of logic for the next two thousand years.
- 2) SCIENCE:
 - a) NATURAL SCIENCE: *Physics, Mechanics, On the Heavens, Meteorology*
 - b) BIOLOGY: *History of Animals, Parts of Animals, Movements of Animals, Locomotion of Animals, Reproduction of Animals*
 - c) PSYCHOLOGY: *On the Soul, Little Essays On Nature*
- 3) METAPHYSICS: *Metaphysics*
- 4) ESTHETICS: *Rhetoric, Poetics*
- 5) ETHICS: *Eudemian Ethics* [Note: *Eudemonism* is defined as a system of ethics basing moral obligations on likelihood of actions to produce happiness],

Nichomachean Ethics (so named because Aristotle's son, **Nichomachus**, edited this work.)

6) POLITICS: *Politics, The Constitution of Athens*

The scope of this list makes it clear that Aristotle was a pre-Renaissance Renaissance man who took in nearly the whole sphere of knowledge. Although he must be considered a universal genius, his genius was of a linear, plodding, methodical sort, like that of the mathematician rather than of the lateral, imaginative, flash-of-insight sort that we normally associate with creative brilliance. Although in his philosophical treatises Aristotle too often loses himself in deductive reasoning, he nevertheless lauds *induction*, accumulates in his scientific works a vast wealth of observations, and occasionally records his own *experiments*, or those of others. Because of his occasionally-inductive and often experimental approach to the acquisition of knowledge, *Aristotle must be considered the Father of the Scientific Method*, as well as the first man known to have organized cooperative scientific research, and the man who created the fields of *Embryology* and *Zoology*, and began the field of *Botany*, which his successor, **Theophrastus**, brought to a higher state of development. In considering the many errors which crept into Aristotle's works, it would be well to remember that this sage covered vast fields — some of which he *created* — and thus had many opportunities to err.

As his accomplishments would suggest, Aristotle was primarily a Natural Philosopher (i.e., a *scientist*), not purely a Metaphysical Philosopher of **Plato**'s ilk, yet he was broad-minded enough to consider the metaphysical ramifications of his physical findings, and this makes him one of the few great spirits in history who merged Natural Philosophy with Metaphysical Philosophy, joining the natural with the mystical. In overview, it might be said that there were three strains in Greek Philosophy: the *physical*, the *metaphysical*, and the *ethical*. The *physical* strain began with the Ionian philosophers (including **Anaxagoras**) and culminated in the empirical tradition of **Aristotle**; the *metaphysical* strain began with **Parmenides**, reached its zenith in **Plato**, and faded into the twilight zone of Religion in the hands of the *Neo-Platonists*; and the *ethical* strain began with **Socrates** and reached its full maturity in the *Stoic*, **Zeno of Citium**. The *physical* development ended in the breaking away of Natural Philosophy (i.e., *Science*) from the less practical forms of philosophy in **Archimedes** and **Hipparchus**; the *metaphysical* development ended in the *skepticism* of **Pyrrho** and the later *Academy*; and the *ethical* development remained until *Epicureanism* and *Stoicism* were assimilated into Christianity.

As to his philosophy, Aristotle was deeply influenced by Plato, yet he nevertheless opposed the Platonistic doctrine of "ideas," holding that an "idea" has no power to produce the corresponding concrete object, and it thus introduces a new complication, while explaining nothing (much as the concept of a "God" of unknown origin introduces

a new complication without explaining anything.) In place of the barren concept of the “idea” he introduced that of “form,” holding that the form of a building in the architect’s mind is in some sense the cause of the building, having a tendency to produce a concrete reality like itself through the agency of the builders. Aristotle introduced **four kinds of “causes”**: the *formal cause*, the *material cause*, the *final cause*, and the *efficient cause*. Thus, in the case of a building, the *formal cause* would be the plan in the constructor’s mind; the *material cause* would be the fact the stones were cut and piled atop one another, or boards were cut and nailed together; the *final cause* would be the end or purpose for which the building was designed (for example, the *final cause* of a granary may be the fact that a place is needed to store grain); and the *efficient cause* is the actual builder. Aristotle was, to begin with, interested in the process and the technique of reasoning; as we have already mentioned, his analysis of the process of reasoning was so incisive that his collection of logical treatises known as the *Organon* became the textbook of Logic for two thousand years. Longing to think clearly, Aristotle shared with **Socrates** a passion for defining his terms by classifying things and ideas into which genus they belong, and then noting the specific differences that distinguish them from all other members of that class. For example, in response to the question, “What is man?” he would answer by classifying man with other, similar life-forms: “Man is an animal.” Then he would specify what he considered to make man unique among the other animals: “Man is a *rational* animal.” [Perhaps the men that Aristotle knew were rational, but if man is indeed a rational animal, there is very little evidence of it *this* day in age!] It is characteristic of Aristotle’s methodical way that he arranged in **ten categories** the fundamental aspects under which anything can be considered or classified: 1) *substance*, 2) *quantity*, 3) *quality*, 4) *relation*, 5) *place*, 6) *time*, 7) *position*, 8) *possession*, 9) *activity*, and 10) *passivity*. Aristotle accepted the senses as the only source of knowledge. He held that “universals” are generalized ideas which have no objective existence outside the mind of the thinker, but are formed from many perceptions of similar objects. In other words, Aristotle considered “universals” to be conceptions, not things, and he criticized his predecessors for having drawn the Universe — or at least their theories of it — out of their heads instead of devoting themselves to experimentation and to observing the world as it really is. Although **Plato** had defined philosophy as “the science of the idea,” **Aristotle** redefined it as “the science of the universal essence of that which is actual.” These definitions shed light on the stylistic differences between Plato and Aristotle: Plato’s definition is succinct, perhaps even poetic — although vague, abstract, and insubstantial, while Aristotle’s definition is ineloquent and tediously wordy, but down-to-earth and more substantial. This divergence of style between Plato and Aristotle was largely a matter of temperament. There was in Plato a powerfully imaginative, almost fantastic, streak which inclined him always to bold flights of fancy and away from the humdrum details of the everyday world. On the other hand, there was nothing other-worldly about Aristotle. In ethics, in science, in politics, even in theology, Aristotle was only interested in man’s place in *this* world, and how man could best understand and improve the *real* world. Aristotle dedicated his life to examining the “humdrum details”

of the world, and found marvels in even the lowliest life-forms. While Plato sought spiritual escape from this world, (a tendency which leads naturally to monasticism) Aristotle was more characteristically Greek in that he delighted in immersing himself in the world around him, finding it to be filled with wonders and beauty — which is precisely the spirit of the modern scientist, or the naturalist.

In science, Aristotle picked up where **Democritus** left off, and he ventured boldly into every field. He was weakest in mathematics and physics, and confined himself to the study of first principles. He sought in his *Physics* not new discoveries but clear definitions of the terms used: *matter, motion, space, time, continuity, the infinite, change, and end*. In Aristotle's view, motion and space are continuous — they are not made up, as **Zeno of Elea** assumed, of infinitely divisible moments or parts; the “infinite” exists potentially, but not actually. Aristotle perceived (though he did not solve) the problems that were to arouse **Newton**: *inertia, gravity, motion, and velocity*; he had some idea of the parallelogram of forces (i.e., vector summation) and stated the *law of the lever*, before **Archimedes** quantified it: “The moving weight will more easily move the farther [the applied force] ... is from the fulcrum.”

On the subject of astronomy, Aristotle held that the heavenly bodies — and certainly the Earth — are *spherical*, for only a spherical Earth could explain the shape of the Moon when it is eclipsed by the intervention of the Earth between it and the Sun. Aristotle also grasped the leisureliness of secular changes that occur over geological time: periodically but imperceptibly, he tells us, the sea is replaced by the land, and land by sea; countless nations have appeared and disappeared, whether through swift catastrophe or plodding geological time. “Probably every art and philosophy has been repeatedly developed to the utmost and has perished again,” he tells us. In Aristotle's view *heat* is the chief agent of geological and meteorological changes (a view which still holds up well today). He hazarded explanations of clouds, fog, dew, frost, rain, snow, hail, wind, thunder, lightning, rainbows, and meteors. Some of his theories seem bizarre today, but the epochal importance of Aristotle's little treatise on meteorology is that it invokes no supernatural agencies, but seeks to account for vagaries of the weather through *natural causes* operating in certain sequences and regularities. Natural science could go no farther than Aristotle took it until invention gave it instruments of greater scope and precision, with which to observe and measure the natural world.

It was in the field of *Biology* that Aristotle was most at home, and it was in this field that he observed most widely and abundantly, and made the most mistakes. Aristotle's supreme achievement was his consolidation of previous discoveries in life science. With the help of his pupils, he gathered data on the flora and fauna of the Aegean countries, and brought together the first scientific collections of animals and plants, including scientific information and life-forms sent back from the military expeditions of **Alexander the Great**. Having investigated about 540 species of animals, Aristotle

classified the animal kingdom into *enaima* and *anaima* (“blooded and bloodless”) approximately corresponding to our *vertebrates* and *invertebrates*. He subdivided the “bloodless” animals into testaceans, crustaceans, mollusks, and insects; and the sanguineous animals into fishes, amphibians, birds, and mammals (thus paving the way for **Carl von Linné**, 21 centuries later, who shared Aristotle’s passion for classifying life-forms, and who developed the binomial *Linnean System of Classification of organisms* that we still use today.) Indeed, it must be said that Aristotle’s “Ladder of Life” was the very prototype of modern classification schemes. In this *Scala Naturæ*, it is clear that Aristotle came to view nature as organized gradually from lifeless matter through complex forms of plant and animal life. This view is reflected in Aristotle’s model of biological organization (i.e., the *Scala Naturæ* or “Ladder of Life”) which was really the first theoretical framework in the history of biology. Aristotle covered vast and varied fields in biology. He studied organs of digestion, excretion, sensation, locomotion, reproduction, and defense. He also studied the types and ways of fishes, birds, reptiles, apes, and hundreds of other groups; their mating seasons and their methods of bearing and rearing their young; the phenomena of puberty, menstruation, conception, pregnancy, abortion, heredity, and twins; the habits and migrations of animals, their parasites and diseases, their modes of sleep and hibernation. He also gave an excellent account of the life of the bee, and recorded exceptional modes of development of fish (such as the fact — rediscovered in modern times — that in one species of dogfish the offspring is linked to the womb of the mother by an umbilical cord and placenta, much in the manner of a mammal.) But Aristotle also recorded many queer incidental observations: that the blood of oxen coagulates more rapidly than that of most other animals; that some male animals, especially the goat, have been known to give milk; that “in both sexes the horse is the most salacious of animals after man.” [Perhaps he was unacquainted with the chimpanzee.] Aristotle was particularly interested in reproductive structures and habits of animals, and he marveled at the multiplicity of ways in which Nature achieves continuance of species, “preserving the type when she is unable to preserve the individual.” He further noted that the life of animals revolves around two foci: *eating* and *reproduction*. Aristotle called the female organ of generation the “ovary” for he regarded it as essentially an egg repository. He hypothesized that the female element of reproduction contributes building material and food to the embryo, while the male element contributes energy and movement; the female is the passive element, while the male is the activating agent. In some ways, Aristotle anticipated many theories of 19th Century biology. Like **Von Baer** he taught that in the embryo the characteristics of the genus appear first, those belonging to the species appear second, and those belonging to the individual third. [We know today that the human embryo rather resembles at first a protozoan (when it is a freshly-fertilized ovum), then a fish embryo, (complete with a structure resembling gill slits of embryonic fish, and a tail) eventually resembling an ape embryo, as if tracing the entire evolution of the individual’s species in the course of its gestation. Only when the embryo has developed to the *fetal* stage, beginning some 35 days after conception, does the occupant of a woman’s womb

begin at all to resemble a human being — or at least a primate.] Aristotle’s description of the chick embryo shows him at his best:

“If you wish, try this experiment. Take twenty or more eggs and let them be incubated by two or more hens. Then each day, from the second to that of hatching, remove an egg, break it and examine it ... With the common hen the embryo becomes first visible after three days ... the heart appears like a speck of blood, beating and moving as though endowed with life; and from it two veins with blood in them pass in a convoluted course, and a membrane carrying bloody fibers from the vein ducts now envelopes the yolk ... When the egg is ten days old, the chick and all its parts are distinctly visible.”

— Aristotle, *History of Animals*, VI, 2-3

According to Aristotle, the human embryo develops like a chick: “In the same way the infant lies within its mother’s womb ... for the nature of the bird can be likened to that of man.” His theory of analogous organs enables him to see the animal world as one: “A nail is the analogue of a claw, a hand of a crab’s nipper, a feather of a fish’s scale.” At times he comes quite close to the modern theory of evolution:

“Nature proceeds little by little from things lifeless to animal life in such a way that it is impossible to determine the exact line of demarcation ... Thus, next after lifeless things in the upward scale come the genus of plants, relatively [unlively] as compared with animals, but alive as compared with inanimate objects. There is in plants a continuous scale of ascent towards the animal. There are certain objects in the sea concerning which one would be at a loss to determine whether they are animal or vegetable ... Some animals are rooted, and perish if they are detached ... in regard to sensibility, some animals give no sign of it, others indicate it obscurely ... And so throughout the animal scale there is a graduated differentiation.”

— Aristotle, *History of Animals*

Aristotle further considered the ape to be an intermediate form between man and other viviparous animals, and, commenting on **Empedocles’** *Theory of Evolution*, Aristotle presented history’s first lucid exposition of the *emergence of species by random chance, and the survival of only the fittest of them*:

“Why should not Nature work, not for some end, or because it is better so, but just as the sky rains — not in order to make the grain grow, but of necessity? For the vapor that is drawn up must cool, and when it is cooled, must become water and descend; and when this occurs, the grain grows. Similarly, if the grain is spoiled on the threshing floor, it did not rain for the sake of this — in order that the grain might be spoiled — but this simply followed. Why then should it not be the same, then, with the parts in Nature — that our teeth, for example, should come up of necessity, the front ones sharp and fitted for tearing, the molars broad and useful for grinding food, not because they are formed for this end but simply by chance? And so with all the other parts in which we suppose that there is purpose. *Whenever all the parts turned out as they would if they had come to being for a purpose, these creatures survived, being organized spontaneously in a fitting way; whereas those which grew otherwise [and were maladapted] perished — and still do perish ...*”

— Aristotle, *Physics* Book II, Chapter 8

This concept lies at the very heart of the modern theory of Evolution, which we today attribute to **Charles Darwin**. Amazingly, in his very next sentence Aristotle *rejected* this essentially modern notion of **Empedocles** on the grounds that he could not accept that anything in Nature happens at random. This Aristotle did because he enthusiastically embraced the view taught by **Socrates** and **Plato**, that one must not confuse the antecedent conditions which are necessary for a given event, and the true cause which really explains *why* it occurs. In a view which is much more useful to ethical philosophy than to Natural Philosophy (science) Socrates, Plato, and Aristotle held that the best explanation, the only *real* explanation, consists in identifying the end or *purpose* to be achieved by any event. The underlying assumption of this view is that what is true of human behavior is also true of mere physical events. This is a clear case of anthropomorphism — the attribution of human qualities or motives to non-human (sometimes even inanimate) things — for, whereas human behavior can be explained in terms of purposes, the same surely cannot be said of plants, or seas, or the stars. But Aristotle explicitly overrules this objection when he states, in his *Physics*, “As in intelligent action, so in Nature. Intelligent action is for the sake of an end, therefore the nature of things also is so.” In his exposition of the Empedoclean *Theory of Evolution* quoted above, Aristotle seems to have disagreed with the concept that he so compellingly presented because he held that things in Nature do not happen at random or by chance. “We do not ascribe to chance the frequency of rain in winter,” he countered, and fire does not burn by chance, nor is each sunrise a random event. “Therefore action for an end is present in things which come to be and are by nature.” Aristotle had in his hands the *Theory of Evolution* almost in its entirety, he compellingly presented this concept created by **Empedocles**, and at the last minute he deferred to **Plato**’s mode of thinking, and rejected it. This was clearly Aristotle’s biggest boner. The conclusion does not follow, that all things happen for a purpose, simply because the sun rises with predictable frequency and not by chance; moreover, to assume that this is so stands very much in the way of scientific progress. Certainly, the rising of the sun is not a random event — there is an order inherent in Nature and everything always occurs in accordance with Natural Laws. The more that we understand these natural laws, the more we are able to predict

the things that happen in the Cosmos, and the less unpredictable — the less *random* — the happenings in the world appear to be. But the fact that regularly-recurring phenomena such as the rising of the sun are not random events does not oblige us to assume that there must be some human purpose or goal behind what is in essence matter's complete obedience to Natural Law. The great defect in the approach which Aristotle thus adopted consists in the fact that it *seems* to yield satisfactory results, which, however, yield no real advance in our knowledge at all, and even *stymie* any such advance. The tendency of flames to rise upwards Aristotle might "explain" by saying that their "end" or their "aim" is to reach a higher place; that plants grow can similarly be explained by the supposition that they aim at achieving the full-grown state. But these explanations are not fruitful — they are really nothing more than rephrasings of the very fact to be explained: fire rises because it naturally does so, and plants grow because they grow. If we accept such explanations, we are not likely to investigate these phenomena further in order to determine the natural laws that are at work. Genuine advances in scientific understanding have in fact always taken the form that **Socrates**, **Plato**, and **Aristotle** explicitly rejected — that is, the discovery of the antecedent conditions upon which a certain result is found to follow. It was clearly a mistake for Aristotle, the great Natural Philosopher, to adopt the teleological approach of his masters, who were after all *ethical* philosophers, and the scientific polemicists of the Renaissance, hoping to encourage practical research into causes in this sense, reserved their most withering criticism and contempt for Aristotle's damaging wrong step at this important point. The best we can say about this, Aristotle's greatest blunder, is that at least it reveals that Aristotle was open-minded enough to present a view he disagrees with (i.e., the *Evolutionary Theory* of **Empedocles**) in not only a fair manner, but even compellingly. That he regarded such open-mindedness as an ideal to be striven for is evidenced by his famous quote:

"It is the mark of an educated mind to be able to entertain a thought without accepting it."

—Aristotle

Another mistake made by Aristotle was his adoption of the *geocentric cosmological theory* of **Eudoxus**. In this view, all of the celestial bodies revolve about a fixed Earth on concentric crystalline spheres of different radii, and since everything plainly appeared to revolve about the Earth, our planet was of course taken to be the center of the Universe. Not a century after Aristotle, a Greek astronomer of the Alexandrian school, **Aristarchus of Samos**, proposed the more nearly correct *heliocentric theory* (i.e., that the Earth and other celestial bodies revolve about the *sun*) but this new theory was abandoned due to large discrepancies between prediction and observation, and the more accurate *epicyclical geocentric theory* of **Claudius Ptolemaeus** was favored until the time of **Copernicus**. We cannot blame Aristotle for not knowing what we know today — that the rotating planets revolve about the sun in elliptical orbits. This is not an easy thing to figure out simply by looking at the sky without the aid of instruments. Nobody in

Aristotle's time could know for sure what it would take the invention of the telescope to prove: that the Earth is *not* the center about which everything else in the Universe revolves. Yet somehow we fault Aristotle for not being omniscient, and we blame on *him* the violently-enforced orthodoxy of those mouthpieces of God, the *scholastic* churchmen who adopted him as one of their unquestionable authorities. More harmful to the advancement of science was Aristotle's view that the same Natural Laws do not apply everywhere in the Universe — that different Natural Laws apply in the Heavens as those that we see operating here on Earth. But again, Aristotle did not originate the distinction between celestial and terrestrial physics. Such a distinction was taken for granted by his predecessors. After all, on Earth, did not all objects tend to fall down or rise (in the case of smoke) while in the heavens everything revolved and stayed up forever? Again, without a telescope, it is by no means obvious that the same Laws of Nature apply in heaven as they do on Earth. If Aristotle could be faulted for anything in this regard, he should be faulted only for failing to question what he was taught — things that seemed obvious to everyone around him. Who among us is not guilty of the same fault? (Those who are foolhardy enough to question the prevailing orthodoxy today are still persecuted for this unpardonable crime, just as they always have been.) It is sometimes held that Aristotle's pioneering work in Logic has been damaging to the advancement of man as well. This, however, is certainly unfair. It is true that his investigation and classification of certain types of deductive argument was so masterfully done that for centuries it was thought to be both final and complete; but this prejudice (coupled with the abject submission to authority among those Medieval Monks, the *Scholastics*) was not Aristotle's fault. It is unfair to bring his own greatness as a charge against Aristotle. All our conceptions of the material world — *scientific theories*, as we call them — should be but temporary devices to be abandoned when occasion demands. *This is a proposition which Aristotle himself put forth.* In expounding the motions of the planets he advised his readers to compare his views with those that they themselves reach. Does this sound like the dogmatic pronouncement of an intellectual tyrant? The fact that his scheme lasted for two thousand years without effective criticism is no fault of his. It is rather evidence that the men who followed him — strait-jacketed as they were by violently-enforced orthodoxy and religious dogma — were dwarves compared with “the master of those who know.” On the whole, what Aristotle achieved has withstood the test of time amazingly well, and in many ways his work on logic was more powerfully creative than anything else that he did. Even if in Medieval times Aristotelian Logic was abused as a prop for religious dogma, the mental discipline which it provided for at least two thousand years was on balance enormously beneficial to the history of thought. Perhaps it is because he was so great, that we are disappointed to find that Aristotle, like every other man that ever lived, was not infallible. His voluminous works contain many errors — some of them gross. His *History of Animals* is replete with ludicrous errors. In this work, for example, we are expected to believe that mice die if they drink in summer; that elephants suffer from only two diseases — catarrh and flatulence; that all animals but man develop rabies when bitten by a mad dog; and that eels are generated spontaneously.

Aristotle knew the internal organs of animals better than those of men, for neither he nor **Hippocrates** seem to have overridden religious taboos by dissecting human bodies. As the result of some sort of prohibition against actually checking to see if these things are so, Aristotle thought that men have only eight ribs, that women have fewer teeth than men, that the heart lies higher than the lungs, that the heart and not the brain is the seat of sensation (he was misled by the insensitivity of cerebral tissue to direct stimulus), and that the function of the brain is (literally) to cool the blood. In keeping with his view that everything happens by design, Aristotle said that “It is evident that plants are created for the sake of animals, and animals for the sake of men.” [If he had stated instead that “Animals arose only because of plants, and plants in turn have come to depend upon the animals that parasitize them,” he might have come closer to the truth, for animals could never have arisen without plants — and would cease to exist without them — because without plants, the Earth’s atmosphere would lack free oxygen, and all the food that animals need to survive comes ultimately from plants. But we animals are not quite mere parasites of plants — we serve an important purpose for them. We replenish the atmosphere’s minuscule supply of carbon dioxide, which plants need to survive, and, bribed by their beauty or the sweet nourishment of their fruits, we animals help to broadcast the seeds of the plants, even going so far as to nurture their offspring. Considering these facts, it is clear that plants and animals are *symbionts* — each depending upon the other for their very existence.] In Aristotle’s view, even human buttocks were designed for a purpose: “Nature has made the buttocks for repose, since quadrupeds can stand without fatigue, but man needs a seat.” [Aristotle, *Politics*] And yet even this last passage reveals the mind of the scientist at work: Aristotle takes it for granted that man is an animal, and seeks natural purposes for the anatomical differences between beasts and men. Despite its many errors, the *History of Animals* must be regarded as Aristotle’s supreme work, and the greatest scientific product of Fourth Century (B.C.) Greece. Biology had to wait twenty centuries for its equal.

When he turned to the study of man, Aristotle’s approach was less scientific and more metaphysical. He defined the soul (*psyche*), or vital principle, as the “primary entelechy of an organism” — in other words, the organism’s inherent and destined form, its urge and innate direction of growth. In Aristotle’s view, the soul is not something added to, or residing in, the body, rather, it is coextensive with the body. It is the sum of the functions of the organism, so that the soul is to the body as vision is to the eye. And because it is the functions that dictate the structure needed to accomplish those functions, it might be said that the soul forms the body. In keeping with his penchant for drawing distinctions and classifying things according to these distinctions, Aristotle maintained that the soul has three grades: 1) the Nutritive, 2) the Sensitive, and 3) the Rational. Plants share with animals and men the nutritive soul (i.e., the capacity for self-nourishment and internal growth); animals and men have in addition the sensitive soul (the capacity for sensation); the higher animals as well as men have the “passive rational” soul (the capacity for simpler forms of intelligence); man alone has the “active rational” soul (i.e., the capacity

to generalize and to originate.) We are informed that Aristotle regarded this “active rational” soul as a part or emanation of that creative, rational power of the Universe, which some today call “God;” and this “active rational” soul is immortal. But this immortality is impersonal — what survives is the power, not the personality. The human individual is a unique and mortal amalgam of nutritive, sensitive, and rational faculties — he achieves immortality only relatively, through reproduction, and only impersonally, through death, for when we die we become in a sense immortals, since once we are dead we can never die again (barring reincarnation), and this meets the definition of an immortal: one who will never die.

There are some passages in Aristotle which sound very much like they may have been written by later Christian theologians and fraudulently attributed to the great philosopher, who was so highly venerated throughout Medieval times (the *Theology of Aristotle* was certainly an apocryphal work, *in its entirety*.) For example, we are expected to believe that Aristotle insisted that all causes must be traced back to the “First Cause Uncaused,” and all motions must be traced back to the “Prime Mover Unmoved.” We are further expected to believe that Aristotle insisted that we must assume some origin or beginning for the motion and power in the world, and this source is “God.” Furthermore, this “God” is the sum and source of all motion, so that “He” is the sum and goal of all purposes in Nature; “He” is the Final, as well as the First Cause. Moreover, this “God” is pure thought, rational soul, contemplating itself in the eternal forms that constitute at once the essence of the world, and “God.” The reader will note that these mystical references to “God” (singular and capitalized) are anachronistic. In Aristotle’s milieu there were *many* gods and goddesses, each having a name of his or her own, and **Jesus of Nazareth** had not been born. The Jews were of course already monotheistic in Aristotle’s time, but it seems highly unlikely that this keen scientific mind would adopt the irrational theological ontology of the barbarian cult of the “One God,” *Yahweh*. This would seem out of keeping with Aristotle the logician, the biologist, the naturalist, the scientist. These mystical ruminations which have been attributed to Aristotle sound very much like interpolations or outright fraudulent attributions made by later Christian copyists. At very least they so much contradict Aristotle’s usual down-to-earth way of thinking as to suggest a complete and sudden break in his normally-rationalistic thought patterns and a descent into mysticism. It is possible that in Aristotle, as in **Plato** and **Newton**, rationality coexisted side-by-side with irrational mysticism, but it is also possible that Medieval Christian copyists, seeking to legitimize their shaky doctrines, fraudulently passed off their own mystical ruminations for those of the venerated philosopher.

Aristotle’s view on the arts was that the purpose of art, like metaphysics, is to capture the essential form of things:

“The aim of art is to represent not the outward appearance of things, but their inward significance.”

— Aristotle

Art is an imitation or representation of life, but no mere mechanical copy. That which art imitates is the soul of the matter, not the body or matter itself, and through art's mirroring of essence even the representation of an ugly object may be beautiful. According to Aristotle, Beauty is Unity — the cooperation and symmetry of the parts in a whole:

“Beauty is a gift of the gods.”

— Aristotle

In *drama* this unity is primarily a unity of action; according to Aristotle's analysis, the plot must concern itself with one action chiefly, and may admit other actions only to advance or illuminate this central tale. If the work is to be of high excellence the action must be noble or heroic. Aristotle believed that art may make even terror beautiful — and so to purify it — by giving it significance and form. Aristotle understood the cathartic benefits of tragic drama: by arousing our profoundest feelings, and then pacifying them through a resolving denouement, the tragic drama offers us a harmless and yet soul-deepening expression of emotions that might otherwise accumulate to neurosis or violence; tragic drama shows us pains and sorrows more awful than our own, and sends us home discharged and cleansed. There is a pleasure in contemplating any true work of art, and it is a mark of civilization to provide the soul with works worthy of such contemplation.

According to Aristotle, *comedy* developed “out of those who led the phallic procession.” A *komos* (or “revel”) was at that time constituted by a company of people carrying sacred phalli, and singing dithyrambs to Dionysus, or hymns to some other fertility god. Sex was central to this ancient form of Nature Worship, for the culmination of the ritual was a symbolic marriage aimed at the magical stimulation of the soil — the impregnation of Mother Earth, as it were, so that she would bear the fruits that maintain all life in the world. Hence, in early Greek comedy, as in most modern comedies and novels, marriage and presumptive procreation form the proper ending of the tale. The comic drama of ancient Greece would today be regarded as obscene because its origin was frankly phallic; it was originally a *joyous celebration of reproductive powers, in which sexual restraints were temporarily suspended*. [If the reader wishes to participate in an updated version of such an orgiastic festival, he or she should check out the section in this web-site entitled Take This Orgy Survey and Party Naked!]

In Aristotle's view, *the good life is the happy life*, and in his *Nichomachean Ethics* (so called because it was edited by Aristotle's son, Nichomachus) Aristotle proposed not (like **Plato**) how to make men good, but (like **Democritus**) how to make them *happy*. All things other than happiness, he maintained, are sought with some other end in view; happiness alone is sought for its own sake. Certain things are necessary to lasting

happiness: good birth, good looks, good health, good luck, good reputation, good friends, good money and goodness itself. “No man can be happy who is absolutely ugly,” said Aristotle, and “As for those who say that he who is being tortured on the wheel, or falls into great misfortunes, is happy provided only he be good, they talk nonsense.” [Aristotle, *Ethics*] With a candor rare in philosophers, Aristotle quoted the answer of Simonides to king Hieron’s wife, who asked whether it was better to be wise or to be rich: “[It is better to be] Rich, [than wise] for we see the wise spending their time at the doors of the rich.” But wealth is merely means, it does not satisfy anyone but the miser, and since wealth is relative, it seldom satisfies a man long. The secret of happiness is action, the exercise of energy in a way suited to man’s nature and circumstances. In Aristotle’s view, Virtue is a practical wisdom, an intelligent appraisal of one’s own good. Usually virtue is a golden mean between two extremes; intelligence is needed to find this mean, and self-control (*enkratia* or “inner strength”) is needed to practice it. Virtue, then, is not an act but a *habit* of doing the right thing. At first this habit must be enforced by discipline, since the young cannot judge wisely in these matters; in time, that which was the result of compulsion becomes a habit, “a second nature,” almost as pleasant as desire. Despite the fact that he had earlier indicated that happiness is to be found in action, Aristotle concluded that the best life is the life of thought. Thought is the mark or special excellence of man, and “the proper work of man is a working of soul in accordance with reason.” Furthermore,

“The most fortunate of men is he who combines a measure of prosperity with scholarship, research, or contemplation; such a man comes closest to the life of the gods.”

— Aristotle, *Ethics*

“Those who wish for an independent pleasure should seek it in philosophy, for all other pleasures need the assistance of men.”

— Aristotle, *Politics*

Regarding slavery, Aristotle looked upon the slave as an animate tool, and thought that slavery would continue in some form until all work could be done by self-operating machines [this prediction did not fall far short of the truth, for it was the Industrial Revolution that ended slavery.] That he did not think the life of the common laborer was much better than the life of the slave is evidenced by his statement that:

“All paid jobs absorb and degrade the mind.”

— Aristotle

Presumably, Aristotle did not refuse pay for his teaching, though, in the fear that this might degrade his mind.

Aristotle's views on government were remarkably utilitarian, for he believed that *the function of the state is to organize a society for the greatest happiness to the greatest number*. He felt that the state is a natural development, for "Man is by nature a political animal" [Aristotle, *Politics*] — that is to say, man's instinct leads him to association with others of his kind. Having collected and studied 158 Greek constitutions, Aristotle divided them into three types: *monarchy* (i.e., the "rule of one" — usually a king or queen), *aristocracy* (i.e., the "rule of the best" — technically, the most outstanding citizens, although this usually amounted to a ruling class of nobles), and *timocracy* (defined by **Plato** as a state in which love of honor and glory is the guiding principle of the rulers, but defined by **Aristotle** as a state in which political power is in direct proportion to property ownership). Any one of these types of government may be good according to time and place and circumstance. "Though one form of government may be better than others," said Aristotle, "yet there is no reason to prevent another from being preferable to it under particular conditions." [Aristotle, *Politics*] With a degree of insight that can only come from studying the historical results of many types of government, Aristotle concluded that *any form of government can be good when the ruling power seeks the good of all rather than its own profit, and in the contrary case, any type of government is bad*. Every type of government can degenerate into oppression when it becomes government for governors instead of for the governed. When this happens monarchy lapses into despotism, aristocracy into oligarchy (the rule of an elite few), and timocracy degenerates into democracy ("rabble rule," by those uneducated and untrained for it). When the single ruler is good and able, monarchy is the best form of government, but when he is a selfish autocrat (absolute, dictatorial ruler) we have a tyranny (today meaning an oppressive or cruel rule, but in historically a *tyrant* was one who seized absolute power without legal right, and a *tyranny* was the rule of the tyrant regardless of whether that rule was fair or oppressive) which is the worst form of government. An aristocratic government may be beneficial for a time, but aristocracies tend to deteriorate. As Aristotle put it, "Noble character is now seldom found among those of noble birth, most of whom are good for nothing ... Highly gifted families often degenerate into maniacs, as, for example, the descendants of Alcibiades and the elder Dionysius; those that are stable often degenerate into fools and dullards, like descendants of Cimon, Pericles, and Socrates." [Aristotle, *Rhetoric*] When aristocracy ("the rule of the best") decays it is usually replaced by a plutocratic oligarchy (the rule of the wealthy few). This is better than the despotism of a king (a bad monarchy) or a mob (a bad democracy), but a plutocratic oligarchy almost invariably results in the conscienceless exploitation of the poor by the wealthy, until the poor can take no more, and rise up in bloody revolt. Aristotle assures us that democracy (meaning government by *demos*, i.e., the common citizen) is just as dangerous as oligarchy (the rule of a privileged few) for it is usually based upon a revolutionary victory of the poor over the rich in the struggle for power, and leads to a suicidal chaos. Aristotle thought that democracy is at its best when it is dominated by peasants (rustic land-laborers) who own their land, and is at its worst when ruled by the urban rabble of mechanics and tradesmen. Aristotle acknowledged that the

“multitude judge of many things better than any one person, and that from their numbers they are less liable to corruption,” [Aristotle, *Politics*] and this is the greatest virtue of democracy. But government requires more than just incorruptibility — it requires a special knowledge of statecraft and it is highly unlikely that, say, a man trained in wrestling or football instead of in statecraft will be able to wisely rule a state or nation, and this is the flaw in democracy. Contrary to the idealist fantasy one hears asserted as an article of faith today, Aristotle maintained that *all men are created unequal*, and he cautioned that the upper classes will as readily make seditions if an unnatural equality is enforced, as the lower classes will rebel when inequality becomes too extreme. According to Aristotle, when a democracy is dominated by the lower classes the rich are taxed to provide funds for the poor, and giving money to the poor is “like pouring water into a sieve” [Aristotle, *Politics*]. And yet a wise conservative will not let poor people starve. “The true patriot in a democracy ought to take care that the majority are not too poor ... he should endeavor that they may enjoy perpetual plenty; and as this is also advantageous to the rich, what can be saved out of the public money should be divided among the poor in such quantity as may enable each of them to buy a little field.” [Aristotle, *Politics*] If this could be done, then poor beggars would become peasant farmers and would cease to depend upon hand-outs from the state — and might actually begin to *contribute* (through the taxes they pay) to the system which pulled them out of destitution. Aristotle went on to offer some modest recommendations, not for an utopia, but for a modestly better society. Although Aristotle’s style is often long-winded, bombastic, and ineloquent, his insights, based upon much comparative study, are worthy of being kept alive in the mind of man. He suggested that a wise ruler would, in considering any proposal, consult with those having many years of experience directly related to that proposal. This would allow him to find out in advance whether the scheme would be useful, “for almost all things have already been found out.” [Aristotle, *Politics*] Regarding the issue of communism versus private possession, Aristotle astutely observed that “what is common to many is taken least care of, for all men have greater regard for what is their own than for what they possess in common with others.” [Aristotle, *Politics*] He further asserted that “those states are best instituted wherein the middle classes are a larger ... part than either the rich or the poor ... Whenever the number of those in the middle [class] .. has been too small, those who were the most numerous, whether the rich or the poor, always overpowered them [and took control] ... When either the rich get the better of the poor, or the poor of the rich, neither of them will establish a free state.” [Aristotle, *Politics*] To avoid these oppressive dictatorships from above or below, Aristotle proposed a “mixed constitution” or “timocracy” — a combination of aristocracy and democracy, in which the right to vote will be restricted to landowners, and a strong middle class will be the balance wheel and the pivot of power, for...

“When there is no middle class, and the poor greatly exceed in number, troubles arise, and the state comes to an end.”

— Aristotle

Aristotle further suggested that “The land ought to be divided into two parts, one of which should belong to the community in general, the other to the individuals separately.” [Aristotle, *Politics*] In Aristotle’s time, each Greek city was a self-ruled and largely independent state unto itself. So natural was the concept of the city-state to the Greeks before the advent of high-speed travel and high-speed global communications, that one word — *polis* — sufficed for both “city” and “state.” Under Aristotle’s system, all citizens would in this city-state system own land, and only they shall vote or bear arms. They would constitute a small minority of the population — ten thousand at most. This limit to the population of citizens was for logistical purposes: Aristotle conceived the state as an association of freemen under one government and capable of meeting in one assembly; a democratic state of more than 10,000 citizens, he thought, would be impracticable. “None of [these citizens] should be permitted to exercise any mechanic employment or live by trade, for these are ignoble, and destroy excellence.” [Aristotle, *Politics*] But neither should they be husbandmen (farmers): “... the husbandmen should be a separate order of people” — presumably slaves, for Aristotle regarded slavery as legitimate. His justification of slavery ran thus: As it is right that the mind should rule the body, so it is just that those who excel in intelligence should rule those who excel only in strength. (Aristotle would have been bewildered and perhaps disgusted to find that today democracy has degenerated into a plutocratic kakistocracy — a rule of wealthy dunces.) Under Aristotle’s system the citizens would elect public officials, and hold each to account at the end of his term. “Laws, properly enacted, should define the issue of all cases as far as possible, and leave as little as possible to the discretion of the judges,” [Aristotle, *Rhetoric*] and “It is better that law should rule than any individual ... [for] He who entrusts any man with supreme power gives it to a wild beast, for such his appetites sometimes make him; passion influences those who are in power, even the very best of men; *but Law is Reason without Desire.*” [Aristotle, *Politics*] In Aristotle’s view, it is the province of a state to regulate property, industry, marriage, the family, education, morals, art, literature and music. For example, Aristotle advocated that all youths be trained in music of the Dorian mode, which was thought to make men brave and dignified. Of course, state regulation of music, literature, and art amounts to censorship, and censorship is incompatible with freedom of expression and intellectual advancement. In this respect, Aristotle’s state resembles **Plato’s** dystopian Republic. Although Aristotle was himself an aristocrat, he was forced to admit that one of the short-comings of aristocracy (“rule of the best”) is that it tended to degenerate into a plutocracy (rule of the wealthy). The example he cited was the wealthy Spartans, who in his time owned “domains of vast extent, the others having nothing; all the land is in the hands of a few.”

Aristotle’s view on population control was that “It is even more necessary to take care that the increase of the people should not exceed a certain number ... [for] to neglect this is to bring certain poverty upon the citizens.” [Aristotle, *Politics*] Abstinence was of course not even *considered* as a means of population control — for this runs contrary to human nature — and contraceptives were in those days not very reliable, so Aristotle

advocated abortion, holding this to be far preferable to infanticide. Another means to population control that Aristotle recognized was homosexuality and lesbianism, and indeed, he even attributed the homosexual tendencies of Greek culture to fear of overpopulation — although, of course, wives and daughters were sequestered by the men that owned them in Greek culture, leaving only prostitution and homosexuality as sexual outlets for the many sex-starved males that were seldom even allowed to *see* a woman.

On the subject of eugenics, Aristotle — like the Spartans before him, and like **Luther** after him — decreed that “nothing imperfect or maimed shall be brought up.” [Aristotle, *Politics*] Finally, on the subject of the military, Aristotle rejected the belligerence of the Spartans and exhibited a surprisingly enlightened pacifism: “Since the highest virtue is intelligence, the pre-eminent duty of the state is not to train the citizens to military excellence, but to educate them for the right use of peace.”

Will Durant’s concluding words on Aristotle buck fashionable trends toward harsh criticism of Aristotle’s influence on history, and are worth repeating here:

“It is unnecessary to sit in judgment upon Aristotle’s work. Never before, so far as we know, had anyone reared so impressive an edifice of thought. When a man covers a vast field many errors may be forgiven him if the result adds to our comprehension of life. Aristotle’s faults — *or those of the volumes that we perhaps wrongly count as the considered product of his pen* — are too obvious to need retailing. He is a logician, but he is quite capable of bad reasoning; he lays down the laws of rhetoric and poetry, but his books are a jungle of disorder, and no breath of imagination stirs within their dusty leaves. And yet, if we penetrate this verbiage we find a wealth of wisdom, and an intellectual artistry that opened many paths in the country of the mind. He did not quite found biology, or constitutional history, or literary criticism — there are no beginnings — but he did more for them than any other ancient whom we know. To him science and philosophy owe a multitude of terms that in their Latin forms have facilitated learned communication and thought — *principle, maxim, faculty, mean, category, energy, motive, habit*. He was, as Pater called him, ‘the First of the Schoolmen’; and his long ascendancy over philosophical method and speculation suggests the fertility of his ideas and the depth of his insight. His treatises on ethics and politics stand above every rival in fame and influence. When all deductions have been made he still remains ‘the Master of Those Who Know,’ an encouraging testimony to the elastic range of the human intellect, and a comforting inspiration to those who labor to bring man’s scattered knowledge together into perspective and understanding.”

— Will Durant, *The Story of Civilization*, Book II, *The Life of Greece*

Unable to top such a conclusion, we leave the reader with a couple of aphoristic parting shots from the pre-eminent philosopher himself:

“Dignity does not consist in possessing honors, but in deserving them.”

— Aristotle

and ...

“Well begun is half done.”

—Aristotle

