Greek Contributions to Human Civilization

by Khan Amore

1. The ancient Greeks invented **Democracy**. The very term itself is of Greek derivation, meaning "People's Rule." Never before (and, sadly, never *since*) has a people been ruled collectively, by a majority vote of its citizens. Unlike modern states which call themselves "Democratic" the Greeks had a *true* Democracy: Whenever any important decision of state needed to be made (such as the decision of whether or not to go to war) the citizens would meet in a plenary public council, and the most eloquent backers of a proposal would make their case before the assembly, and the most eloquent dissenters would offer rebuttal. The citizens would then vote on whether or not to enact the proposal, and the will of the majority would prevail. There are, however, a few disadvantages to this system of government. First of all, it is well-adapted for small city-states in which all citizens can be called together in council, at moment's notice, whenever a governmental decision needs to be made, but for large states or empires in which the citizens are separated by vast distances, Democracy was really not practicable (although it *might* be workable again today, thanks to the Internet, a global telecommunications network which could be used to link the whole world into a single community, capable of near-instantaneous intercommunication). The English aristocrat, Winston Churchill, once said, "The best argument against Democracy is a five-minute talk with the average voter." This quote points out another disadvantage inherent in Democracy: A Democracy can only work well if the voting citizenry is intelligent, wise, well-educated, apprised of current events, and is ever-willing to shoulder the burden of running the state. In ancient Athens, Democracy worked well because the Ionian Greeks *were* brilliant, well-apprised of current events, and were taught that taking an active part in running their state was not only a duty, but an honor — it was the price of Freedom. And because the only people who could vote to go to war were the same people that would be *fighting* that war (i.e., male citizens), the decision to go to war was never taken lightly. Today, in that self-proclaimed bastion of "Democracy" called the United States, we do not have a true Democracy in which the citizens make all important decisions of state directly, rather the United States is a *Republican State* where, in essence, the only decision the citizens are allowed to vote on is the choice of *which despot* is to rule over them for the next few years. In the United States, those who decide on war do not themselves participate in the slaughter — they never see or feel the suffering which results from their decision to attack other nations — and so a situation is more likely to arise in which a simple-minded despot, for reasons of arrogance, vanity, hatred, or the hunger for power, wealth, or greatness, may cower in a bunker on the other side of the world from the battle field as he sends the young pawns of his nation into harm's way, to kill innocent men, women, and children of other nations, or be themselves killed in the attempt. It could be argued that a representative form of government such as that which we find in the United States is really better suited to the Age of Specialization, for we might expect a career politician to be better able to run the country than would

a cab-driver or janitor, but the persuasiveness of this argument is diminished when we consider the caliber of career politicians of the U.S. in our time. Before they had a Democracy, the ancient Greeks had an *Aristocracy* (meaning "Rule of the Best") but Americans are so dead set against a nobility, or ruling class, that they gladly choose *Plutocracy* ("Rule of the Wealthy") or even *Kakistocracy* ("Rule of the Worst") in its stead. Helen Keller was referring to this quintessentially American tendency when she said, "We, the people, are not free. Our Democracy is but a name. We vote? What does that mean? We choose between Tweedledum and Tweedledee." To make matters worse, most of the candidates that we have to choose from we know nothing about, and our votes really amount to little more than random drawings of names. Even if we should know something about a given candidate, there is really no way of knowing what decisions that candidate will make once he is in a position of power. Another flaw in Democracy is that it assumes that the votes of two football players are worth more in deciding national energy policy than the vote of one physicist. Truth is not decided by a majority vote. If it were, then the Earth would in truth have been flat throughout the whole of the Middle Ages. Democracy is inefficient and fickle — but therein lies both its weakness and its strength. If two nations, a democratic nation and a nation ruled by a dictator, were to be attacked, the dictatorship would certainly be faster in responding than the nation that would have to debate the matter and then put it to the vote. But the "Rule of Many" offered by a true Democracy provides crucial checks and balances that would serve to prevent a fool or a madman from entrenching himself in a position of power and wreaking havoc upon the world. As events in the very first years of the Third Millennium have proved, one fool in a position of power can do more damage than a hundred wise men can set right again. A true Democracy would limit the damage which could be done by a single fool in power, unless, of course, the majority of the voters were also idiots (which, sadly, is not a far-fetched scenario.) A dictatorship is certainly more efficient when it comes to legislation, too, for a dictator can dash off laws as quickly as he can write them, and they can be quickly enacted without debate. But perhaps the inefficiency of Democracy is an *advantage* in the case of law-making. Laws should not be too easy to make, for the fewer laws a nation is burdened with, the better. Because it diminishes Freedom, excessive legislation should be outlawed, but this is unlikely to happen because the people who would be called upon to make this anti-legislation law would, in passing such a measure, be putting themselves out of a lucrative and leisurely job. It would seem that the legislational inefficiency of Democracy is our best hope in curtailing excessive legislation. As Will Rogers put it, "Just be glad you're not getting all the government you paid for." But, just because we don't live in a true democracy doesn't mean that we shouldn't bother to vote. In a Democracy, politics is everyone's business. Or duty. What's the point in having a voice in your government (however small) if you fail to use it, and by voluntary muteness allow yourself to be ruled *oligarchically* by the few fools who *do* speak up? As Plato put it, "Those who are too smart to engage in politics are punished by being governed by those who are dumber." Democratic nations are not ruled by their

citizens in general, but by those few citizens who bother to vote. Local or primary elections usually have a low voter turn-out, and in these elections your vote has more clout because there are fewer votes. For example, if you were the only voter to turn out for such an election, your vote would totally determine the outcome of the election, and your opinion would be the only one which mattered out of those of all the voters who didn't bother to vote. If you live in a "democracy" and you don't bother to vote, you might as well be living under a dictatorship, for in either case you have no say in what happens to you. Those that don't vote have no advantage over those that *can't* vote. If you don't vote, you give up your bitching rights, and you will deserve whatever you get.

2. The ancient Greeks invented **Tragedy**, **Comedy**, **Drama**, and **Theatre**. Indeed, most of our theatrical terms derive directly from the Greek. For example, the word "tragedy" comes from the Greek *tragoidia*, meaning "goat-song," in reference to the fact that it arose from the mimic representations, in dancing and singing, of satyr-like Dionysian revelers dressed in goat costumes; "comedy" similarly comes from the Greek word, *komos*, "to revel;" *Drama* is itself a Greek word meaning "action;" and "theatre" comes from the Greek *theatron*, which in turn is believed to come from the Greek word *theaomai*, meaning "Behold!" A spectator of a fifth century B.C. dramatic performance (or play) would walk along the level aisle (*diazoma*) and climb up the steps (*klimakes*) to reach his seat in a given section (*kerkis*) of the horse-shoe shaped theatre (*theatron*), a semi-circular ascending stepped bank of seats which looked down upon the performance. The theatres were quite large, in fact, the theatre of Dionysus in Athens seated some 17,000 persons. Before the spectators lay a level circular area called the *Orchestra*, in the center of which stood an altar, which often served as a stage prop in the plays. The performances were often religious in character and the throne of the presiding priest of Dionysus was the best seat in the house. Most of the maneuvers and dance figures which were performed by the *chorus* as they presented their *Odes* were performed in the *Orchestra*. To the right and left of the *Theatron* were the *Parodoi*, which were entrances and exits for both spectators and for masked actors or *chorus* members. Directly beyond the circular *Orchestra* lay the *Skene*, or scene-building. In most plays, the *skene* represented the façade of a house, a palace, or a temple, and normally had three doors which served as additional entrances and exits for the actors. Immediately in front of the scene-building was a level platform, called the *proskenion*, where most of the dramatic action took place. Flanking the *proskenion* were two projecting wings, called the *paraskenia*. Dramatic productions of the Fifth Century B.C. often employed two mechanical devices. One, the *Eccyclema*, was a sort of platform on wheels which, so far as we can discover, was rolled out from the *skene* and held stage setting intended to represent an interior scene. The other was the known simply as "*the machine*." Often at the close of a play the dramatist resorted to the introduction of a god into the action, in order to miraculously resolve unresolved problems and tie together loose plot elements. Such a god would naturally be expected to appear from above, so the

dramatic deity was brought in by some sort of crane or derrick, called "the machine," and lowered onto the stage, perhaps suspended on the end of a rope. Inasmuch as the god who was lowered into play in this way usually served to disentangle the complicated threads of the plot, and often seemed to be brought in gratuitously by playwrights unable to work out a dénouement from elements already in play, the term *deus ex machina*, ("the god from the machine,") has become standard in dramatic criticism. [The plot of Khan Amore's novel, *HYPATIA*, might be said to involve a "*deus ex **tempus** machina*."] In Athens of the Fifth Century B.C. dramas were presented only twice a year, during religious festivals. Elsewhere, and at other times, plays were presented at rural festivals in various Greek communities, when the productions were "taken on the road." In the city, the less important of the festivals, called the *Lenaea*, or Festival of the Wine-Press, was held in January/February of each year. The more important festival, though, was the so-called *Greater Dionysia*, which was celebrated annually in March/April in honor of the god, Dionysus. Huge audiences attending these orgiastic festivals also made it a point to watch the dramatic performances, which were held daily for about a week in each of the two seasons. Early in the Fifth Century B.C. the admission to the performances was free, but later the cost was two *obols*, which could be refunded by the State to anyone who could show that this cost would inflict undue hardship. Under Pericles, these admission fees to the theatre were secured from the public treasury for each citizen who chose to ask for it. Present-day miserly American Philistines affiliated with the Republican party may grumble that even the *original* "Democrats" were "bleeding-heart, artsy-fartsy, tax-and-spend liberals," but it must be kept in mind that taxes are the price we pay to live in a civilized society, and in the higher civilization of the ancient Greeks, the theatre was the equivalent of the modern pulpit, press, and television rolled into one. The policy of paying everyone's admission to the theatre was not merely to keep the populace entertained, but was rather a measure intended to edify and to advance the intellectual training of the citizens — citizens who needed to be kept educated, for the welfare of the state depended upon their wisdom, as they were the true rulers of the Democracy. Just as in ancient Rome, where it was the duty of emperors, senators and wealthy aristocrats to foot the bill for public entertainment ("Bread and Circuses,") so in ancient Athens a wealthy citizen stood the cost of theatrical production — it was a responsibility which was placed upon him by the State, and was regarded as a legitimate obligation of his high position and citizenship in a society which was, after all, the source of his wealth and privileged existence. Thus it seems that the wealthy pagans of ancient Greece felt it was their sacred duty, through patronage of the arts, to pay back the society which had given them so much.

3. The ancient Greeks invented **Logic**. The science of logic was first formulated by **Aristotle**. Later investigations into this field served only to extend his work, but did not alter its basic principles. Logic is the science dealing with the principles of valid reasoning and argument. Aristotle devoted his attention almost exclusively to *a priori* or *deductive* logic, which derives the particular from the general, and this form

of syllogistic reasoning served as the primary tool of thought which enabled the development of Euclidean Geometry, which in turn continues to serve as the foundation of mathematics in general. (The fuller development of logic's *inductive* form had to await the arrival of Francis Bacon and John Stuart Mill.) Again, Logic may be defined as the *Science of Reasoning*, or the *Science of the Laws of Thought*. The laws of thought are *natural laws*, like gravity, with which we have no power to interfere, or to change, as we can do with man-made laws. Logic is quite simply the most powerful tool of thought in man's possession. It enables us to determine with complete certainty, whether a given proposition is correct or incorrect, *from the form of the argument itself*, without even knowing any of the particulars. To illustrate the power of this tool of reasoning, consider the well-known syllogism: 1) All men are mortal. 2) Socrates is a man. Therefore, 3) Socrates is mortal. We may not know whether or not all men are mortal, or whether Socrates is in fact a man, but Logic assures us with complete certainty that if these two premises are correct, then the conclusion (i.e., that Socrates is mortal) is without a doubt correct, too. The logical, rational, Greek mode of thought disappeared from the face of the Earth right around the time of Hypatia's brutal public assassination by a band of Christian monks under the command of Saint Cyril. At that critical juncture in history, when the Last Keeper of the Flame of Greek Knowledge was snuffed, Faith finally vanquished Reason, and for a thousand benighted years the mind of man stagnated and wallowed in the violence and madness of religious superstition.

4. The ancient Greeks invented **Science**. Not this science or that science, mind you, but *science in general*. The word itself derives from the Latin *Scientia*, from *scire*, "to know," although this derivation is misleading, for science is by no means Roman in origin. The literal meaning of the word *Science* is "knowledge," but the term is really taken to mean "a systematic body of knowledge of the physical Universe and all it contains, derived, formulated, and accumulated in accordance with logical and scientific principles." Science may be divided into three types: 1) *Applied Science*, a discipline which uses the methods and findings of science solely for the practical purpose of developing and producing new technology, products, or structures, 2) *Natural Science*, a study dealing with material phenomena, and based mainly on observation, experiment, and induction (as in chemistry and biology), and 3) *Pure Science*, a pursuit of truth or knowledge depending on logical deductions from self-evident truths (as in the fields of mathematics or logic) without overriding concern for practical applications. It should come as no surprise that the same people that gave us logic should also give us science, which relies so heavily on logic. Mind you, some attempts at the systemization of knowledge were made in the older civilizations of ancient Egypt and Babylonia — attempts which included the designation of units of measure, the development of a simple arithmetic and geometry used mainly for land surveying, and the elaboration of a calendar based on the observed periodicity of astronomical events, but the Egyptians and Chaldeans, clever as they were, did not use logical reasoning as a general method of discovering Truth

as did the Greeks. The earliest peoples to attempt to discover the *causes* of natural phenomena through observation and reasoning were the Ionian Natural Philosophers of ancient Greece, including Pythagoras of Samos, who derived the earliest system of geometry. Later Greeks, including Plato and Aristotle, largely abandoned the observational method of the Ionians in favor of *metaphysics*, although Aristotle did not discard the observational method entirely, for he did attempt biological experimentation. In the 3rd Century B.C. (in the "Alexandrian Age") the Alexandrians Aristarchus and Hipparchus applied scientific methods to the study of astronomy and Archimedes devised the elementary principles of mechanics and hydrostatics, thus laying the groundwork for the development of both Physics and Calculus by Isaac Newton almost nineteen centuries later. Indeed, some of the findings of the ancient Greek Natural Philosophers have been incorporated without alteration into modern science. Even today, just as every beginning student of Mathematics must still learn the Pythagorean Theorem, so every beginning student of Science and Engineering is still taught Archimedes' Hydrostatic Principle, and Archimedes' principles of levers and compound pulleys. Mind you, Archimedes did not invent the lever. That tool has been in use from time immemorial — even an ape may use a stick as a lever — but it is one thing to use or even to contrive a device, and quite another to lay bare its exact mathematical principles, and to follow these principles to their logical conclusions. This is what Science does, and this type of logical analysis is the gift that the ancient Greeks gave to the world. Indeed, this was the whole trend of the Greek mind. As Edith Hamilton puts it in her excellent work, *The Greek Way to Western Civilization*, "To be versed in the ways of nature means that a man has observed outside facts and reasoned about them. He has used his powers not to escape from the world but to think himself more deeply into it. To the Greeks the outside world was real and something more, it was interesting. They looked at it attentively and their minds worked upon what they saw. This is essentially the scientific method. The Greeks were the first scientists and all science goes back to them." After the Church gained ascendancy, and religious Faith ruled the world, this rational, free-thinking, quintessentially Greek mode of thought disappeared from the face of the Earth for nearly a thousand years. Throughout the Dark Ages and Middle Ages, when the Church ruled Europe, Science made little advance other than in the work of the Arabian alchemists. Then, near the close of the Middle Ages, when those few surviving earlier works of the ancient Greek scientists were re-discovered (having been preserved in Moslem libraries), Greek rationality came once again into the world, and the foundations of modern science were laid on this substratum of ancient Greek wisdom.

5. The ancient Greeks invented **Lyrics**. The lyric was originally a song to be sung to the accompaniment of the lyre — an ancient, three-stringed to twelve-stringed (usually seven-stringed) instrument having two horns and a sounding board made of a tortoise shell covered with bull's hide. The poet and musician, Terpander ("Delighter of Men"), who was born on Lesbos, is known as the first Greek lyric poet because he

was the first to set poems to music. Having killed a man in a brawl, this inaugurator of the *Great Age of Lesbos* was exiled, and found it convenient to accept an invitation to live in Sparta. There he lived the remainder of his days, teaching music and training choruses. It is said that his life ended at a drinking party, when he was singing. It seems that one of his auditors threw a fig at him while his mouth was open wide to sing one of the extra notes he had added to the music scale, and this edible token (whether of reward or criticism) lodged in his windpipe and choked him to death in the very ecstasy of song. (Because praise and criticism were more likely to be expressed physically in earlier times, when a performer "died" on stage in those days, he *really* died.) Terpander was followed later in the 7th Century B.C. by those other famed lyricists of Lesbos, **Alcaeus**, who invented the *Alcaic Strophe*, and **Sappho**, the greatest poetess of all time, whose lyrical love poems are the most sublime ever written.

6. The ancient Greeks invented the field of study we call **History**. The word itself means "investigation" in Greek. Of course, since the end of Pre-Historic times, men had been recording chronicles, legends, and myths, but there is a difference between story-telling and unbiased, unjudgmental, strictly factual history, and the man who is called the "Father of History" was a Greek. His name was **Herodotus**. Born in Fifth Century B.C. Halicarnassus (a Doric Greek colony in Southwest Asia Minor, which at the time was under the domination of Persia), Herodotus wandered the world in search of knowledge, enjoyment, wonder, and beauty, recording all he saw in a delightfully selfless, unfiltered and unprejudiced style. He was the first sight-seer in the world, and perhaps the happiest one as well. His journeys practically reached the boundaries of the known world of his time, and he recorded the many wonders he saw in his book *History* — a term used for the first time by him, in our sense of the word. The hallmarks of Herodotus' style were those of the ideal historian: the complete omission of personal bias, the unflagging allegiance to truth rather than dogma, and the complete suspension of judgment. His writing is without mannerism, without an iota of self-consciousness. It is always simple, direct, lucid, interesting, and readable. As an example of his open-mindedness, and of the care he always took to differentiate what was known from what was merely *believed*, of the West he wrote:

> "I am unable to speak with certainty. I can learn nothing about the islands from which our tin comes, and though I have asked everywhere I have met no one who has seen a sea on the West side of Europe. The truth is no one has discovered if Europe is surrounded by water or not. I smile at those who with no sure knowledge to guide them describe the ocean flowing around a perfectly circular earth."
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> — Herodotus

This is an example of the way in which the Greek mind worked. The great river Ocean encircling the Earth had been described by Homer, the revered, even sacred authority, and by Hesiod, second only to Homer, and yet Herodotus without a qualm about impiety blithely declines to accept the truth of this assertion on authority, yet he is always mildly tolerant of other people's views and never dogmatic about his own. Quite as characteristic of Herodotus is his matter-of-fact statement that the priestess at Delphi had been more than once bribed to give an oracle favorable to one side in a dispute. This was attacking the Greek holy of holies — like accusing the Pope of taking bribes. Herodotus had a great respect for the Delphic oracle, but to his mind that was no reason to suppress a charge which he had investigated, and which the evidence supported — and it was *certainly* no reason to refrain from investigation. As Edith Hamilton put it, "When an authority, no matter how traditionally sacrosanct, came into conflict with a fact, the Greeks preferred the fact. They had no inclination to protect 'sound doctrine taught of old.' A new force had come into the world with Greece, the idea of Truth to which personal bias and prejudice must yield."

7. The Greeks of the Sixth century B.C. originated the secular, rationalistic, empirical approach to **Medicine** which still today dominates mainstream medical practice. Man has practiced medicine from pre-historic times, but, although in earliest times some excellent herbal medicines were in use (notably *opium*), the healing arts were in general intimately associated with the rites of magic and religion. The duties of the shaman, witch-doctor, or medicine man of primitive cultures often included not only guardianship of health, but also propitiation of spirits to ensure successful crops, and the destruction of enemies with magical spells. Illness was attributed to evil spirits (which fetishes, amulets, and talismans were used to avert), the sick were sometimes killed to defuse epidemics, and the mentally deranged were regarded with awe. Primitive medical treatments were generally mystical in nature, although there was an extensive plant lore which in some cases may have exceeded our own knowledge of poisonous or healing plants (for example, consider the blow-gun poison, *curare.*) Medical practice in Egypt arose around 3000 B.C. but at first, it too, was magico-religious in nature. Gradually, Egyptian medical practice began to include empirico-rational elements such that, while diseases of inaccessible organs were still treated by the spells and incantations of the priest-magician, diseases of accessible areas (such as the skin or eyes) were treated in a more rational manner by healers which were the first in history to qualify as *physicians*, not mere sorcerers or priests. Third-Dynasty Egyptian medicine was the best of its day, and the ancient Nile-dwellers even practiced *dentistry*. In Mesopotamia, a vast number of medical remedies were in use (including more than 500 drugs), but, because of the theocratic system prevailing in Assyria and Babylonia, the practice of medicine in those countries could not break away from the influence of demonology and magical practices. Semitic influence on Mesopotamian life squelched any possibility of medical advance, as the concept of *sin* as the cause of disease grew predominant, and prayer supplanted medicine. Hebrew medicine was similarly retarded by the strait-jacket of religion. Disease was considered evidence of the wrath of God, and the only surgical procedure in practice

was the ritualistic mutilation of circumcision. Ancient Hindu (Vedantic) medicine of 1500 to 1000 B.C. was far better. The Hindus of that time had a very rich *materia medica* — they even used marijuana and henbane for inducing anaesthesia, and the ancient Hindu drug *Rauwolfia serpentina,* became the first modern tranquilizer. In the field of operative surgery the Hindus are acknowledged to have attained the highest skill in all antiquity. They were probably the first to perfect skin grafting, and plastic surgery for the nose. Unfortunately, with the rise of Buddhism in India the study of anatomy was prohibited, and the Moslem conquest brought further decline and ultimate stagnation in the field of medicine. Nearby, in ancient China, doctors were paid when their patients were kept well, not when they were sick. Believing that it was the doctor's job to *prevent* disease, Chinese doctors sometimes even paid the patient if the patient lost his health. If a patient died, a special lantern was hung outside the doctor's house, and at each death another lantern was added. If a physician's residence accumulated too many lanterns, his business would naturally decline, and the doctor would be left no recourse but to open a lantern shop. Lantern salesman probably abounded in those days, for in ancient China the progress of medicine was impeded by that culture's abject reverence for authority. Although some effective drugs were in use (notably opium), and the novel form of counter-irritation offered by acupuncture was developed there, religious prohibitions against dissection in ancient China resulted in inadequate knowledge of body structure and function, and without anatomical and physiological research, medicine was unable to advance. Although the earliest Greek medicine also labored in the domain of magic and spells, by the 6th Century B.C. Greek medicine had become thoroughly secular, stressing the importance of clinical observation and experience. Around the 5th Century B.C. **Alcmæon** of the Pythagorean school in the Greek colony of Croton in southern Italy was the first to assert that it was the brain, and not the heart, that was the seat of the senses. In that same period, two other famous schools of Greek medicine flourished in Cos and Cnidus, under the semi-priestly sect known as the *Æsclepiads*. It is likely that students of both these schools contributed to the *Hippocratic Corpus*, a collection of writings by more than one author, although popularly attributed to **Hippocrates** of Cos, known as the *Father of Medicine*. In all these works there is no mention of supernatural cures. Although some of the medical theories that the ancient Greeks labored under may today seem absurd (such as the Empedoclean concept that disease is an expression of a disturbance or imbalance of the four "elements" of Anaxagoras, namely, fire, air, water, and earth) this was the first time in history that an entire system of medicine arose which intentionally and systematically excluded any element of magic, of religion, of the supernatural. Indeed, throughout the rest of the ancient world those who practiced the healing art were regarded as magicians or priests versed in supernatural magic rites, while the Greeks alone called their healers *physicians,* which means "those versed in the ways of nature." The highest ethical standards were demanded from the physicians of that time, who were required to take the celebrated *Hippocratic Oath,* an oath still taken by physicians today. Knowledge of Anatomy was based on the study of animals, and

Physiology was based on the four cardinal humors, or fluids, of the body, namely blood, phlegm, yellow bile, and black bile. Although this outmoded theory may today seem ridiculous, it should be remembered that a theory doesn't need to be true to be of value in the ascent of man — if a theory generalizes a large number of seemingly unrelated facts, and is used to predict new results, and especially if it leads to new discoveries, then it has served its purpose well, and should not be regarded with embarrassment later, when that theory is discarded for a better one. The true genius of Hippocrates is to be found in the justly venerated *Aphorisms* and *Prognostics*, containing pithy expressions of philosophic outlook and vast clinical experience. Although not a practicing physician, the philosopher **Aristotle** contributed greatly to the development of medicine by his dissections of numerous species of animals. Not content with merely being the *Father of Logic*, Aristotle also made himself the *Founder of the field of Comparative Anatomy*. By the 3rd Century B.C. Alexandria — the seat of the famous Library, and the world's first University, called the "Museum" — was firmly established as the center of Greek medical science. It was in Alexandria that the anatomist **Herophilus** performed the first recorded public dissection of the human body, and the physiologist **Erasistratus** established for all time the important nutritional function of the blood. Among the followers of these pioneers in the field of medicine were the medical *empiricists*, who, rejecting theory entirely, based their doctrine on experience gained by trial and error. The empiricists excelled in surgery and pharmacology, and a royal student of empiricism, **Mithridates**, King of Pontus, developed the concept of inducing immunity to poisons by the administration of gradually increasing doses of it (i.e., *mithridatism.*) Modern medical practice is in effect a direct descendant of Alexandrian Greek medicine, which was adopted by the Romans after they had conquered and assimilated Egypt. The chief medical writers of the Greco-Roman period which followed included **Celsus**, who wrote an encyclopedia of medicine in the 2nd Century A.D., **Dioscorides**, the first scientific medical botanist, and **Galen** of Pergamon who is regarded as the second most important physician of antiquity, after Hippocrates himself. Galen was held as the undisputed medical authority throughout the whole of the Middle Ages, although his anatomical knowledge of man was defective, having been based upon study of the ape. Indeed, some of Galen's teachings actually *retarded* later medical progress, owing to the slavish and unquestioning submission to not only his authority, but to *all* authority, of the Medievals under the yoke of theocracy, throughout the thousand years when Faith ruled the world. During these Dark Ages the field of medicine, which had made great strides under the Greeks, descended again to the level of primitive superstition as the churchmen assured their flocks that illness was caused by demonic possession, to be cured by prayer, penitence (including monetary "donations" to the Church), and exorcism. As history has shown time and again, without the free-thinking, authority-rejecting mode of inquiry which was brought into the world by the Greeks, there can be no progress.

8. The ancient Greeks revolutionized **Architecture**, **Sculpture**, and **Painting**. By the year 500 B.C. Athens had experienced an artistic and intellectual development which made their civilization nobler and more promising than any the world has ever seen. Moreover, this civilization was essentially the beginning of our own. The remains of Egyptian or Babylonian sculpture and architecture arouse our admiration and interest as curiosities, but they are foreign to us. With the remains of a Greek temple, or a fragment of a Greek poem, of the year 500 B.C., we feel at home. We can't help but feel *this might have been built, or written, by our own people.* This is because we are the children of the Greeks — Western civilization is but a continuation of the one begun by them. As Shelley put it, "We are all Greeks. Our laws, our literature, our religion, our art, have their roots in Greece." To this, Henry Sumner Maine added: "Except the blind forces of Nature, there is nothing that *moves* in the world today that is not Greek in origin." Greek art was an unprecedented, seemingly miraculous emergence of a dynamic vital style which celebrates the beauty of the real world, and in which mind and spirit co-exist in serene equilibrium. Everyone on Earth today is familiar with Greek architecture, whether they know it or not. Almost every university or government building that is intended to be taken seriously is an imitation of Greek architecture. One has but to look at the apparent white marble and fluted columns of the U.S. Supreme Court Building, and the sculpted frieze on that building's pediment, to see in it the intentional echo of a Greek temple. The intellectual and artistic genius of the Greeks exploded into the world during the *Periclean Age*, when Athens was at the head of a "confederacy of equal states" (which really amounted to an Athenian Empire.) Part of the policy of Pericles was to adorn Athens from the surplus revenues of the empire. This may have been an injustice to the other "equal member states," but the result was to make the city the most beautiful in the world, so that, ever since, even her mere ruins have enthralled the admiration of men. Greek art was at that time just reaching its perfection, and everywhere in Athens, under the charge of the greatest artists of this greatest artistic age, temples, colonnades, and porticoes inimitable to this day popped up like mushrooms. No description can do justice to the splendor, the strength, the beauty, which met the eye of the Athenian, whether he walked around the fortifications, or through the broad streets of the Piraeus, or in the shades of the Academy, or amidst the tombs of the Ceramicus, whether he chaffered in the Agora, or attended assemblies in the Pnyx, or loitered in one of the numerous porticoes, or watched the exercises in the gymnasia, or listened to music in the Odeum, or plays in the theatres, or joined the throng of worshippers of the goddess, Athene, ascending to the great gateway of the Acropolis, and the crown jewel of the city's citadel — the *Parthenon* itself. And this magnificence was not the result of centuries of toil; it was the work of a mere fifty years, and in those years architecture, sculpture, and painting achieved such perfection that even today they have yet to be rivaled. Every year the ruins of the Parthenon still bring millions of visitors to Athens. Perhaps the first impression one receives there is that the plan of the Greek temple was starkly simple, perhaps even austere — not at all like the vast, spacious Cathedral of Notre Dame, in which

even the ornaments have ornaments on them. But it should be borne in mind that Greek temples were not churches for worshippers to congregate in. Greek temples were the homes of divinities — people only brought offerings to the gods and goddesses there, when they wished to ask for favors. In the words of Edith Hamilton, " ... the Parthenon is the home of humanity at ease, calm, ordered, sure of itself and the world. The Greeks flung a challenge to nature in the fullness of their joyous strength. They set their temples on the summit of a hill overlooking the wide sea, outlined against the circle of the sky. They would build what was more beautiful than hill and sea and sky and greater than all these ... The Parthenon was raised in triumph, to express the beauty and the power and the splendor of man ." As with Greek architecture, Greek sculpture was marked by similar stark simplicity. Decoration did not interest the Greeks. In all their art, and even in their literature, they were preoccupied with what they wanted to express, not with frilly ways of expressing it; and florid, highly ornamented styles did not appeal to them at all. To quote Edith Hamilton yet again, "Greek art is intellectual art, the art of men who were clear and lucid thinkers, and it is therefore plain art. Artists than whom the world has never seen greater, men endowed with the spirit's best gift found their natural method of expression in the simplicity and clarity which are the endowment of the unclouded reason. 'Nothing in excess,' the Greek axiom of art, is the dictum of men who would brush aside all obscuring, entangling superfluity, and see clearly, plainly, unadorned, what they wished to express." As the ever-eloquent Will Durant put it, in Greek sculpture, "Technique had been mastered, anatomy was understood, life and movement and grace had been poured into bronze and stone. But the characteristic achievement of Pheidias [the greatest of the Greek sculptors] was the attainment and definitive expression of *classic style*: strength reconciled with beauty, feeling with restraint, motion with repose, flesh and bone with mind and soul ... [Greek sculpture] shows classic restraint at its best, and teaches even a romantic soul that feeling speaks with most power when it lowers its voice." Unfortunately for the world, few undamaged originals of Greek architecture or sculpture are extant, and *no* Greek paintings whatsoever have survived. But we know from surviving written accounts of them, that Greek paintings were of the same high order of excellence as everything else the ancient Hellenes had a hand in. The Greeks adored genius in painting as in every other field, and a certain pupil of Apollodorus, named Zeuxis, through his use of perspective and chiaroscuro, made himself the supreme figure in Fifth Century B.C. painting. He was a grandiose character, bold, conceited, and self-assured of his brilliance. At the Olympic games he strutted about in a checkered tunic on which his name was embroidered in gold. He was quite wealthy, and he gave away many of his masterpieces, on the ground that no price could do them justice; and cities and kings were happy to receive them. He had only one rival — Parrhasius of Ephesus, an artist almost as great and quite as vain. Parrhasius wore a golden crown on his head, called himself the "Prince of Painters," and said that in him art had reached perfection. He did it all in good humor, though, singing as he painted. The rivalry between Parrhasius and Zeuxis eventually came to a head in a public competition.

Zeuxis painted such a life-like picture of a boy holding a bunch of grapes that the birds flew down to peck at them. People acclaimed him the master-artist. "If I were," he answered, "the boy would have kept the birds away." When it came time for Parrhasius to reveal his entry in the competition, Zeuxis, confident of victory, bade Parrhasius to draw aside the curtain that concealed the Ephesian's painting. But the curtain proved to be part of the picture, and Zeuxis, having himself been deceived, magnanimously acknowledged his defeat. He suffered no loss of reputation, though. At Crotona, a city famed for the beauty of its women, he agreed to paint a *Helen* for the temple of Lacinian Hera, on the condition that the five most beautiful women of the city should pose nude for him, so that he might select from each her fairest feature, and combine them all in a second goddess of beauty. Of course, this commission required much preliminary research, and the artist needed to bear the burden of fully inspecting *all* of the women of the city who were thought to be the most beautiful, so that he might find the five that he would use in his painting. When he finally found the five most beautiful of all of the city's most beautiful, these he studied long and hard before painting his picture, and when he was done the painting was not a representation of any one of the lovelies he had studied, but fairer by far than the fairest of them all. Sadly, we will never be able to look upon this masterpiece, nor any other Greek painting. Almost all of Greek art was destroyed when classical antiquity gave way to the "Age of Faith," a period known to us as the *Dark Ages*. In those benighted years, when Faith ruled the world, the mind of man dismissed the real world — saw it as hateful and hopeless. The artist turned his back upon things that are seen, in favor of the rapturous visions of his soul. He shut the eyes of his mind to the beauties of Nature and the real world, preferring instead visions of angels and of his crucified Savior. The art of the West, after Rome fell and the influence of the Greeks was lost, went the way of Eastern mysticism. Pictures grew more and more decorative. The three-dimensional realism of the Greeks was replaced by the flat unreality of the stylized until, at the Renaissance, the beauty of the real world was re-discovered with the re-discovery of ancient Greek culture. Once again, Edith Hamilton puts it too well for me to paraphrase: "Two thousand years after the golden days of Phidias and Praxiteles, of Zeuxis and Apelles, when their statues were defaced and broken and all but irretrievably lost, and their paintings were completely gone forever, men's minds were suddenly directed to what was left of the literature of Greece and Rome. A passion for learning like that of Plato's time swept Italy. To study the literature of Greece was to discover the idea of the freedom of the mind and to use the mind as it had not been used since the days of Greece. Once again there was a fusion of rational and spiritual power. In the Italian Renaissance a great artistic development coincided with a great intellectual awakening and the art that resulted is in its essence more like that of Greece than any other before or since. In Florence, where great painters had great minds, the beauty of the real world was re-discovered and men painted what they saw with their eyes ... [for once again men desired] to paint realities, not heavenly visions [and once again, as the creators of beauty in days of old, men had been like gods.] "

9. The ancient Greeks developed **Literature**, **Oratory**, and **Rhetoric** into perfected art-forms. Rhetoric is defined as the art of persuasive, impressive, or eloquent speaking or writing. Among no other people has public speaking been so important and effective as among the citizens of the world's first Democracy, in which every decision of state was publicly debated in plenary assembly. For almost two hundred years, from Themistocles to Demosthenes, great statesman swayed the Athenian city-state by the power of their thrilling eloquence; and enthralled citizens daily packed the Pnyx to hang breathless for hours upon the persuasive words of their leaders. As in our own law courts today, it was often the case which was most persuasively presented that prevailed, not the case which had the most merit. For this reason, public speaking was taught by teachers of rhetoric, called *Rhetors*. The **Sophists** of the Fifth Century B.C. were rhetors who made a profession of teaching rhetoric to anyone who could pay their fee. The emphasis of their instruction was not on Truth or Knowledge, but rather on how to achieve victory in public debate. Many of these teachers became very popular, and amassed great wealth. As masters of the art of persuasion, many sophists came to believe that one proposition could be proved as satisfactorily as another, and some of them developed a skeptical attitude toward religion and morality. Because any questioning of the nature of Right and Wrong, or of the foundations of society, has always been regarded as a subversive activity, the term "Sophist" acquired a pejorative connotation which persists to this day (today, *Sophistry* is usually taken to mean "Captious or fallacious reasoning; reasoning which is sound in appearance only; specious reasoning; a false argument, especially one intended to deceive.") The sophists merely studied and taught the art of political ascendancy and political expedience without regard for ideal or principle — their goal was to teach their students, for a fee, how to use rhetoric as a tool to get them the political power they desired. In other words, these "philosophers" trespassed into the realm of politicians, judges, and legislators who were already in power because they had used precisely these same skills. Those who were already politically entrenched were, of course, not pleased to allow these "philosophers" (i.e., the "sophists") to go around teaching anyone who could pay for it the rhetorical skills which could be used by potential rivals to challenge or unseat them, and this might go far in explaining the trial and death-sentence of Socrates, one of history's great souls, who was accused of sophistry, and of "corrupting the youth." In the Athenian democracy, those who through their eloquence and rhetorical skills often prevailed in public debate were considered the mouthpiece of the common people, and were called **demagogues** (meaning, literally, "Leader of the People.") Because there is a fine line between eloquently speaking for the people, and *swaying* the people, the term "demagogue" has come to connote "A person who stirs up the people by appeals to emotions, prejudice, etc. in order to become a leader and achieve selfish ends.") It would seem that politics has always been a nasty business, then as now, but neglecting for the moment the political applications of skillful oratory and rhetoric, it must be said that the eloquence of the ancient Greeks was truly spell-binding. Athens was the principal city of the Greek state called Attica, and because the Ionian Greeks living in this

region were famed for their eloquence, the term **Atticism** is still today defined as "Extreme classical elegance of speech; simple, concise, refined elegance of expression." Although the art and architecture of the ancient Greeks has been copied everywhere even to the present day, their style of writing has remained peculiar to them alone. In their austere — yet powerful — manner of expression, they have no imitators. An example of this stark simplicity of speech is to found in Homer's *Iliad*, when, during the Trojan War, the noble Trojan hero, Hector, falls. The Greek kings descend upon his dead body, "*and no one came who did not add his wound.*" Another example of Atticism is to be found in Aeschylus' *Prometheus Bound*, where the God Hephaestus permits himself only the rebuke, "*Cruel, thy tongue.*" And as if this were not elegant enough, much of the ancient Greek literature was not only expressed in Atticism, but had rhythm and rhyme as well, as it was meant to be sung to the lyre. Of the four masters of Tragedy three are Greek. One of these, Sophocles, in his Tragedy, *Agamemnon*, invokes the powerful and masterful simplicity of Attic eloquence:

Lo! Sin by sin and sorrow by sorrow —
And who the end can know?
The slayer of today shall die tomorrow —
The wage of wrong is woe.
While Time shall be, while Zeus is lord,
His law is fixed and stern;
On him that wrought shall vengeance be poured —
The tides of doom return.

— Sophocles

As the great classicist, Edith Hamilton summarized the Greek style of writing: "...The lover of great literature when he is confronted all unprepared with the Greek way of writing, feels chilled at first, almost estranged. The Greeks wrote on the same lines as they did everything else. Greek writing depends no more on ornament than the Greek statue [or the Greek temple] does. It is plain writing, direct, matter-of-fact. It often seems, when translated with any degree of literalness, bare, so unlike what we are used to as even to repel ... Clarity and simplicity of statement, the watchwords of the thinker were the Greek poets' watchwords too ... The Greeks were realists, but not as we use the word. They saw the beauty of common things and were content with it ... The Greeks liked facts. They had no real taste for embroidery, and they detested exaggeration ... The things men live with, noted as men of reason note them, not slurred over or evaded, not idealized away from actuality, and then perceived as beautiful — that is the way Greek poets saw the world."

10. The ancient Greeks invented **Philosophy**. Not only a whole slew of specific philosophies, but *the whole field*, as well. The very word, *Philosophy* comes from the Greek, and the concept is quintessentially Greek. It means, literally, *Love of*

Wisdom. The Oxford Concise Dictionary defines *Philosophy* as "Seeking after wisdom or knowledge, especially that which deals with ultimate reality, or with the most general causes and principles of things and ideas and human perception of them, physical phenomena (as in *natural philosophy*), and ethics (as in *moral philosophy*); advanced learning in general (as in *doctor of Philosophy*); a philosophical system; system of principles for conduct of life; serenity, calmness." Philosophy and Science were born together in the Sixth Century B.C. Their birthplace was in Ionia, where, according to Herodotus, "the air and climate are the most beautiful in the whole world." Will Durant, in his *magnum opus*, *The Story of Civilization, Volume 2, The Life of Greece,* explains why it was here, among the ancient Greeks, that secular rational thought first arose: "It was in this stimulating environment that Greece first developed two of its most characteristic gifts to the world — science and philosophy. The crossroads of trade are the meeting place of ideas, the attrition ground of rival customs and beliefs; diversities beget conflict, comparison, thought; superstitions cancel one another, and reason begins. Here in Miletus, as later in Athens, were men from a hundred scattered states; mentally active through competitive commerce, and freed from the bondage of tradition by long absences from their native altars and homes. Milesians themselves traveled to distant cities, and had their eyes opened by the civilizations of Lydia, Babylonia, Phoenicia, and Egypt; in this way, among others, Egyptian geometry and Babylonian astronomy entered the Greek mind. Trade and mathematics, foreign commerce and geography, navigation and astronomy, developed hand in hand. Meanwhile, wealth had created leisure; an aristocracy of culture was growing up in which freedom of thought was tolerated because only a small minority could read. No powerful priesthood, no ancient and inspired text limited men's thinking; even the Homeric poems, which were to become in some sense the Bible of the Greeks, had hardly taken yet a definite form; and in that final form their mythology was to bear the imprint of Ionian skepticism and scandalous merriment. Here for the first time thought became secular, and sought rational and consistent answers to the problems of the world and man." The title of "Father of Greek Science and Philosophy" is almost unanimously conferred upon **Thales of Miletus** (ca. 640-546 B.C.), although, because we have no writings by him but only a couple of ancient references to him, there are those that confer this title upon Thales' better known disciple, **Anaximander** (611-547 B.C.) instead. Some of the theories of Greek Natural Philosophy may seem whimsical to us today (such as Thales' hypothesis that all things came from water, or moisture) nevertheless, these were the first attempts by the mind of man to search for natural explanations, or *Laws of Nature,* instead of resorting to *super*natural explanations. For the first time, when there was a question which needed an answer, or there was a problem to solved, men used the power of their own minds to find a natural answer using *reasoning*, instead of kow-towing to the gods in abject submission in the hopes of obtaining divine guidance or intervention. This was a momentous development in human thought — a development which directly gave rise to Science, and in turn to that child of science, *technology*, along with all its miraculous gifts to mankind.