

UNIT 2 PRE-SOCRATIC THINKERS AND THEIR CONTRIBUTION

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2.0 OBJECTIVES

This unit will help us to understand the following:

- Who are the Pre-Socratics
- Schools of the Pre-Socratics era
- Pre-Socratics as Proto-Scientists or First Scientists
- Pre-Socratics and modern Science.

2.1 INTRODUCTION

It has become an academic sutra to say that the entire academic edifice of the western world is founded on firm foundation laid down by the Greeks. This revolution is said to have taken place in the sixth century BCE. But we know that science began even before the Greek period. Civilizations that developed around the basins of great rivers –the Nile, the Euphrates with the Tigris and the Indus manifest a lot of scientific know-how. These people developed science to meet their existential needs. But it was Greeks who discovered the philosophical explanation that led to the birth of theoretical science. This is accepted as their singular contribution as their contribution led to what we might call the scientific approach to the study of nature. In this unit we will study the pioneering stalwarts of the Greek tradition and understand their contribution to the rise of modern Science.

2.2 PRE-SOCRATIC THINKERS

The thinkers associated with sixth century revolution are known collectively as the Pre-Socratics Philosophers. They were called Pre-Socratics because they preceded Socratics, the great thinker of the golden era of the Greek period in thought, even as the last among them are his contemporaries. The term Pre-Socratics is not well received by some scholars as it seems to derive the identity of those thinkers from Socrates and the Socratic thinkers (Socrates, Plato and Aristotle). Moreover, it is a rough approximation that these thinkers form a unitary group. But the fact that they differ in fundamental ways from their predecessors and their great successors does justify their collective treatment in academics. Within the era of their activity, we can distinguish three main periods. The first is said to be the century of bold innovative thought, next was the period of stringent scrutiny of their early adventures and finally the period of consolidation, in which thinkers of different persuasions attempted each in his own way to reconcile the aspirations of the first thinkers. Hence, the role and importance of these Pre-Socratics cannot be brushed aside, as they have invented Philosophy and Science in the western world.

2.3 THE SCHOOLS OF THE PRE-SOCRATICS

The Greeks themselves liked to talk about the schools of philosophy when they came to write history of their own thought. They classified their philosophy in accordance to the 'schools' and were interested in the narration of 'succession' that presented the story of the master and the pupil and the place where that thought developed. This provided the framework within which the history of their thought can be expounded and understood. We can trace the Ionian school, the Pythagorean brotherhood, the Eleatic, the Atomists schools during the Pre-Socratic period.

Scholars have pointed that two basic questions formed the common denominator of their intellectual activity: (1) What is the basic stuff of everything? (2) How can we explain the process of change ? In doing so they hit upon that special way of looking at the world which is thought to be scientific and rational. They saw the world as something ordered (cosmos) and intelligible. This means the world was not a random collection of bits and its history was not an arbitrary jumble of events. Nor was it controlled by the will of some capricious Gods. This means the world could be orderly without being divinely run. Its order was thought to be intrinsic and internal principles of nature were thought to be sufficient to explain its nature and its structure.

2.4 THE IONIAN SCHOOL OR THE MILESIAN SCHOOL

It makes sense to group together, Thales (624-548) Anaximander (614-540 BCE), Anaximenes (6th Century B.C), together, though the idea that they were a 'school' and master pupil relation is merely a distortion motivated by the desire to impose a systematic framework on the work of the Pre-socratics. However, Miletus being an upcoming city-state territorially small enough to allow to know each other and be acquainted with their respective work it is thought that they knew each other and were familiar with their respective work and ideas.

Thales is said to be the founder of the Ionian school or the Milesian school. He may have been responsible for the creation of the culture of 'know thyself' which was so successfully adopted by the Socratic tradition. He is credited with the introduction of public debate on the explanatory vision of the world (the universe is orderly and can be explained rationally). Launching of such an important debate at the end of the 6th century BCE, a time when communication by sea was particularly frequent meant that the knowledge produced got spread more or less by itself

throughout the Greek trading empire stimulating further reflection and enrichment of the same. But very little is known about this great thinker. It is certain that he attempted to raise the question of the basic stuff of everything in the universe and taught that it was water.

Heraclites (536-470), Xenophanes and Empedocles (490-360 BCE) form the later Ionian Philosophers of the Ionian school. They were separated from the earlier thinkers of the same school not merely in point of time but in respect to doctrine. They depart for the monistic dynamism of the early thinkers and adopt a mechanical dualistic concept of the universe. Heraclites is thought to be a link between the earlier thinkers with the later thinkers.

2.5 THE PYTHAGOREAN BROTHERHOOD

In the 6th century BCE, Greater Greece stretched west all the way to Sicily and Southern Italy. Pythagoras (580-497 BCE), who was born on the island of Samos at a time when the whole of Eastern Greece was becoming unsafe, settled at Croton established a philosophico-religious society. There is a huge mystery surrounding the teachings of Pythagoras. This laid in the very doctrine and teaching methods of his congregation that believed that nothing that the master taught was to be written down or divulged to the uninitiated. Even the disciples were divided into two classes the *mathematikoi*, who were the students privileged to know the thoughts of the Master and the *akousmatikoi* the mere listeners, allowed to know little of his teachings but unworthy of the name Pythagorean. The secrecy appears to be carefully guarded as we can trace relatively few of Pythagorean records. Pythagorean tradition proposed that numbers form the ultimate building blocks of the universe. Thus, we can see how numbers and their relationships have become the chief contribution of the Pythagorean tradition to the world of science. One of the important things that we have kept in mind is that Ionian school passed on the knowledge in everyday language so that it is accessible to everyone. While the Pythagoras school developed knowledge into a tradition of esoteric oral transmission, which in principle was not to be communicated to outsiders of their fold.

2.6 THE ELEATIC SCHOOL

The chief representative of this school was Parmenides (540-480) who was born in the town of Elea. He is the first thinker of whose work we have substantial fragment. This gives us access not only to his conclusion but allows us to think how he argued for his conclusions. He taught that there were two paths, the way of truth and the way of opinion, also known as the way of belief. Truth represented the intrinsic state of nature, an objective state, completely independent of the observers. He believed that our senses are misleading us. He posited an immutable being. Only being was whole continuous and permanent i.e. being was thought to be single, homogeneous, timeless, changeless and motionless. Zeno of Elea (490-430) was another zealous member of this school.

2.7 THE ATOMIST SCHOOL

The Atomist are said to have their origin in the teachings of Leucippus at Abdera. Very little is known of this Philosopher. But he is said to have first thought that the universe was made of a void and of indivisible, unchangeable microscopic atoms. The Greek atomists are heirs of the above thinker. Democritus (460-360) was probably the student of Leucippus. He saw that there was a conflict of Permanence and change and between the continuous and the discontinuous among the Eleatics and the Ionians. Attempting to resolve these apparent contradictions, he presented the doctrine of atoms which form the ultimate building blocks of the universe and as such they were immutable and homogenous in nature and were in random motion and were governed by some kind of attraction and repulsion. The law of attraction is the principle of natural affinity where by likes attacks the likes.

2.8 CHALLENGES TO THE STUDY OF PRE-SOCRATICS

The study of Pre-Socratics has become difficult as their original works no longer exist and we have to rely on the fragments preserved by the later writers. Some of these reports are coloured by the concerns, agendas and the interests of their authors who were sometimes implicitly or explicitly unsympathetic or even hostile to the Pre-Socratics. Hence, there are fears of some degree of distortion of their views. We are indebted to the great Aristotle and his pupil Theophrastus and their successors for handing over discussions of the Pre-Socratics to us. It has

been established beyond reasonable doubt that they viewed their predecessors almost entirely through the lens of their own Philosophies. For instance, it is said that Aristotle understands Thales as a proponent of materialism because he is said to have taught that everything is made of water. Aristotle construes the materialism of Thales by absorbing his teachings through the lens of this four cause theory. But this perhaps is not the case. It is more likely that Thales taught that everything started in water or rests on water. One can find precedents of such an idea in Egyptian or near Eastern mythology.

Sometimes the secondary sources preserved by the later writers are tainted with their bias. Again we can notice how Aristotle has singled out Anaxagoras and bestowed high praise on him, describing him at one point as a sober man compared to his babbling predecessors and another point as 'quite up to date in his thinking' because he taught that Anaxagoras had intuited certain element of his own thinking. The later writers on the Pre-Socratics largely depended on the lost book of Aristotle's pupil Theophrastus, called *the Opinions of the Natural Scientists*, and hence, scholars cannot assert with confidence that all the secondary sources have placed the ideas of their Pre-Socratics predecessors within the right context since almost all of them lived several centuries after them. Hence, the recovery of thought of the Pre-Socratics is indeed full of hurdles. The situation becomes even difficult when we have to churn out the scientific views of the Pre-socratics as we can never be free from retrospective imposition of our notion of science on their work.

Check Your Progress 1

Note: a) Use the space provided for your answer

b) Check your answers with those provided at the end of the unit

1) Who are the Pre-Socratics?

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2) What is the specific contribution of the Pre-Socratic schools?
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2.9 THE PRE-SOCRATICS AS SCIENTISTS

The idea that these thinkers collectively brought something into the world, that is called as a scientific or proto-scientific attitude is gaining academic currency. Some scholars call these thinkers as the Big Bang of science. But it is naïve to lump all the Pre-Socratics together as if they were somehow identical. There is considerable diversity among them. We have seen that they range from shamans like Empedocles, mystics like Pythagoras, prophets like Heraclites to metaphysicians like Parmenides, philosophers like Anagoras and proto-Scientists like the Milesians (Ionians). Although, we might trace a strong variety of views and perspective among them, we can still find something common in them all. Indeed, we can say that they collectively invented Philosophy and Science. What do we mean when we say that they invented Science or Philosophy? Indeed, the Milesians brought something scientific in the world and those like Parmenides and Heraclites reflected upon their predecessors work and were therefore engaging in philosophizing.

Let us understand the above with the help of an example. Anaximanes is a prototype of the earlier Melesian proto-scientific stage. He taught that the prime matter of the universe was air. He believed that original stuff of the entire universe is air. Air and water are closely related. Air when cooled down becomes water. Water transforms itself into various components of the universe. When heated it becomes hot and fiery and forms not just fire itself but fiery heavenly bodies. When condensed it becomes water and ultimately earth. It is interesting to note that Anaximanes chose air and not water as the chief constituent of everything. It is said that he might have been led to this position because of all pervading and dynamic nature of air and because we breathe it and it causes life in us.

2.10 SO CAN WE CALL ANAXIMANES A SCIENTIST?

A question of this kind brings us to the same issue of perceiving the work of Anaximanes and his peers through our own lenses. One thing is certain, Anaximanes himself never understood himself as a scientist in a way we understand by the term today. But he and his peers sowed the first seeds of science. Hence, many scholars teach that they were proto-scientists and as such exhibit what we may call a scientific attitude.

Scholars present the following features as markers of scientific attitude:

1. Optimistic assumption that the universe is comprehensible. “The mystery of the world is that it is comprehensible” Albert Einstein.
2. The assumption that human mind is capable of understanding the world.
3. Adherence to particular set of approaches to problem-solving and starting with simple problems before tackling more complex ones.
4. Tempered Curiosity: curiosity needs to be nurtured so that the scientists do not jump to hasty hypothesis or extravagant leaps of the imagination, nor be governed by prejudice of any form.
5. A love of and facility with abstract concepts.

The pre-Socratics somehow displayed some of these attitudes and that is why it is reasonable to call them proto-scientists. It would be unreasonable to expect them full fledged scientists in the sense of word in our times. But we have enough reason to at least call them proto-scientists. Only condition that disqualifies them from being considered proto-scientists is the hurdle of tempered curiosity. They could be accused of what we might call a rush into wild speculation but they were first to realize that human rational mind is the right tool to understand the world. They were reductionist-that they relied on general hypothesis to explain as many things as possible but they depended on natural phenomena like air. That is why, they were instrumental in giving us the natural explanation of the phenomena rather than a theological explanations that were evoking ancient Greek Gods and Goddesses. To understand this we have to study the predecessors of the Pre-Socratics.

2.11 THE PRE-SOCRATICS AND THEIR PREDECESSORS

Can it be said with great certainty that Pre-Socratics were the first to assume that the rational mind can know the world? Did people before the Pre-Socratics not think or use their brain? In what sense then the pre-Socratics brought something new? Scholars agree that they brought the 'logos' in our understanding of the world. They saw the world around them and asked questions about it. Instead of attributing its creation to anthropomorphic Gods, They sought material and rational explanation.

The predecessors of the Pre-Socratics thought that the divine governed the whole universe. Belief in many Gods was highly systematized and the Greeks organized and regulated their life and activities around these belief. There was a highly developed hierarchy of Gods, where some of the Gods were considered more important than others. The rise and fall of Gods was indeed dynamic and dramatic as some Gods rose in importance above others, and the lesser Gods become demoted as local Gods, demigods, nymphs and so on. The rise of Gods was also connected with the politics of the day. As one settlement gained political prominence over its other neighbors, its deity or deities also gained prominence. This is how the so called major Gods (Zeus) and their extended families emerged as the chief characters of the Greek pantheon. The crystallization of the Gods and the deities into a well organized pantheon was a result of anthropomorphization. This means Gods were created in the image and likeness of humans. Not only did these Gods have family trees, they also had family squabbles. They were merely super-human beings and as such were jealous, angry and selfish like ordinary human beings. It is noted that anthropomorphism is an outstanding character of Homeric religion and hence, Greek religion as a whole.

Thus, the Gods of Greek religion did not have laws but only preferences. Such a world-view is often christened as a mythical worldview and is totally different from the 'logos' centered worldview inaugurated by the Pre-Socratics. Hence, scholars credit the Pre-Socratics for taking the seminal steps to make a leap from the mythos to the logos. Let us understand this with an example, a short glance at the work of epic poet Hesoid (around 700 BCE) can illustrate the

worldview of the predecessors of the pre-Socratics. His poem theogony exemplifies some degree of rationalization. He attempts to use the family tree to order the unstructured world of Gods. A typical branch of the genealogy is that night gives birth to death and sleep and dreams. Thus, Hesoid uses genealogical model to group deities and concepts into intelligible systems. The fact that Hesoid uses the genealogical tool to organize and make sense of the plurality of deities, he still remains fully within mythic framework of his days. This does not mean that before the Pre-Socratics the Greece was inhabited by 'non-thinking' savages leading their life in accordance with random impulses and mystical associations. Indeed, their poetic mythological tradition embeds its own rationality. Anthropologists have demonstrated beyond doubt that so-called primitive people are people more governed by mythos rather than logos. They do think systematically. It is just that they use a different idiom than the one familiar to us. They have different notion of what constitutes cause and effect. They think metaphysically and analogically and more imaginatively. This means the mythical thinking is a pre-philosophical mirror of existential thinking. But our analysis of their thought is conditioned by the post-philosophical perspective.

It is precisely from this mode of thinking do the pre-Socratics distance themselves. They treated the mythical thinking as other, as childish as irrational. Earlier 'Gods are angry' would be a reason enough to satisfactorily explain a natural calamity, while the pre-Socratics inspired a belief in the order in the universe and it is precisely because of this order is intelligible, that human mind can understand it. Thus, we can notice that they truly usher in a paradigm shift in the mode of thinking in the life of humanity. The Pre-Socratics differed from their predecessors not so much in the kind of questions they asked but in the kind of answers they gave. By not adhering to the mythical frame work, they assigned functions of Gods to natural phenomena and relying on reason, they truly inaugurated a new era. Thus basing their conclusions on observation and rational argumentation, they sowed the seeds of science.

Besides their Greek predecessors, the contribution of the neighboring states of the Greece also have its role in the irruption of the scientific attitude among the Pre-socratics. Scholars both ancient and modern have assumed that there were connections between the earliest Greek thought and the intellectual concerns of the eastern empires. It is said that the advaced

astronomy of the Babylonians but have surely become known on the shores of Asia Minor and have stimulated the Ionians to study astronomy for themselves. It is said that Thales' knowledge of the eclipse of the sun in 585 B C E might have been derived from Babylonian learning. The Greek scholars themselves admit that some of the ancient Greek wisdom derived its origin from Egypt as some areas of the Greek thought have some parallels in the land of Pharaohs.

2.12 PRE-SOCRATICS AND MODERN SCIENCE

We can notice a strong link between modern science and the Pre-Socratic thinkers. But they cannot be accepted as scientists as they lacked a rigor of the scientific method. Yet they did initiate an important chapter in the history of science.

Science has its own specialized technical conceptual jargon- mass, force, atoms, tissue, nerve, parallax, ecliptic and so on. This terminology and the conceptual equipment is not God given, it has been invented and pre-socratics are certainly among its first inventors. Their very attempt to develop a scientific explanation triggered the need of conceptual clarity as well as conceptual development. This process was not always self-conscious. Even today scientists are drawn by the impulse of scientific explanation to evolve and develop conceptual framework. Some of the concepts developed during the Pre-socratic era are still like *Kosmos* (cosmos), *phusis* (nature), *techne* (artifice) and are indeed part of modern science.

The pre-socratics certainly developed rational and material explanation of change in the world. This means they emphasized the empirical explanation and with the Pythagoreans emphasized the force of the mathematical explanation. Hence, they are said to be fore runners of experimental and mathematical explanation employed by modern science. It does not mean that all their empirical explanations can be accepted by modern science. Thus, for instance, the teaching of Thales that magnets have a soul because they exhibit movement cannot be appropriated by modern science. But that his explanation had seminal ingredients of a modern scientific explanation allow us to accept the pre-socratics as pioneers of a scientific explanation. Yet the pre-socratics did not show favor to every form of empirical explanation.

We indeed are indebted to the anonymous authors of the medical treatise that have come down to us, under the name of Hippocrates of Cos. Though dating these treatise has its own difficulties,

some of these which we can reasonably be certain were written towards the end of fifth and sixth centuries. These writings exhibit signs of reaction against some aspects of pre-Socratics thought. They seem to react against the dogmatism of the Pre-Socratics as they felt that medicine must above all else be an empirical science. Thus, for instance, *On Ancient Medicine*, the author attacks those who made use of arbitrary postulates such as that everything is made of hot, cold, wet and dry – a typical Pre-socratic theory. Thus, we can notice that the Pre-Socratics were not scientists in the way modern scientists are. That is why, perhaps, they soon became isolated specialists and the next generation only took over their belief in our rational faculty and reasoned argument while their empirical inclinations were soon forgotten.

We can see that sophists were the first heirs of the Pre-socratics. They were more interested in language and in all aspects of logos than they were in nature and the origin of the world. The fact that several sophists were agnostics or atheists might demonstrate their links with Pre-socratic thought yet their focus on rhetoric to gain civic prominence was rooted in the socio-political factors of their times. Hence, we can notice that central concerns of the Pre-Socratics got diluted and the world will have to wait for the emergence of science only at the end of the Middle Ages. A few scientists today recognize that the pre-socratics are the forefathers of science. But a careful study of the pre-socratics can manifest the indebtedness of modern science to some of these great minds.

Although the Presocratics ushered in the shift from mythos to the logos, we have to understand this with a caution as they do manifest an overlap between these two domains. This pre-socratic combination of the vision and logic is a good model for modern science to develop a healthy relation with mysticism, religion and spirituality, since, science can de-soul our world. Perhaps this is beautifully said by the poet Friedrich Vou Schiller (1759-1805) in his poem ‘the Gods of Greece’.

“Yes, home they went, and all things beautiful,

All things high they took with them,

All colors, all sounds of life,

And for us remained only de-souled Word.

Torn out the time-flood, they hover,

Saved on the heights of Pindus.

What shall live immortal in song

in life is bound to go under”.

Thus, we need to stress the logos but at the same time we also cannot get out of our myths. We may not be able to discover our own myths. Perhaps the next generation might understand our myths. Hence, on one hand science can take us from mythos to logos but there is a danger of it becoming a new mythos. Hence, a healthy contribution of the two is the need of the hour.

Check Your Progress II

Note: a) Use the space provided for your answer

b) Check your answers with those provided at the end of the unit

1) Why do we call the Pre-socratics Proto-scientists and Proto-philosophers ?

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2) What is the relation of the Pre-socratics to modern science?

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2.13 LET US SUM UP

The journey that we have undertaken helps us to understand the role and importance of the Pre-Socratics to the emergence of Science in our world. We have tried to understand the Pre-socratic thinkers and their many schools. Due to the lack of access to the primary sources, we have come to understand that it is difficult to come to their original views. The fragments that we have although are limited yet are enough to understand their pioneering contribution in the emergence of science and the philosophy in the west. Their belief in an orderly and intelligible world as well as their preference of material, rational and mathematical explanation has been indeed seminal to the birth and growth of science.

2.14 KEY WORDS

Logos: Logos means “word,” “account,” or “reason,” and it became a technical term in philosophy, beginning with Heraclitus (ca. 535–475 BC), who used the term for the principle of order and knowledge in the universe. The sophists used the term to mean discourse, and Aristotle applied the term to rational discourse. The Stoic philosophers identified the term with the divine animating principle pervading the universe. After Judaism came under Hellenistic influence, Philo (ca. 20 BC–40 AD) adopted the term into Jewish philosophy. The Gospel of John identifies the Logos, through which all things are made, as divine (theos), and further identifies Jesus as the incarnation of the Logos.

Cosmos: Cosmos is an orderly or harmonious system. It originates from a Greek term “cosmos” meaning order or orderly arrangement, and is the antithetical concept of chaos.

2.15 FURTHER READINGS AND REFERENCES

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2.16 ANSWERS TO CHECK YOUR PROGRESS

Answers to Check Your Progress I

1) It is of academic currency to say that the entire academic edifice of the western world is founded on firm foundation laid down by the Greeks. This revolution is said to have taken place in the sixth century BCE. The thinkers associated with sixth century revolution are known collectively as the Pre-Socratics Philosophers. They were called Pre-Socratics because they preceded Socrates, the great thinker of the golden era of the Greek period in thought, even as the last among them are his contemporaries. The term Pre-Socratics is not well received by some scholars as it seems to derive the identity of those thinkers from Socrates and the Socratic thinkers (Socrates, Plato and Aristotle). Moreover, it is a rough approximation that these thinkers form a unitary group. But the fact that they differ in fundamental ways from their predecessors and their great successors does justify their collective treatment in academics.

2) What is a specific contribution of the Pre-socratic schools?

Scholars have pointed that two basic questions formed the common denominator of the intellectual activity of the Pre-socratic schools. They are : (1) What is the basic stuff of everything? (2) How can we explain the process of change ? In doing so they hit upon that special way of looking at the world which is thought to be scientific and rational. They saw the world as something ordered (cosmos) and intelligible. This means the world was not a random collection of bits and its history was not an arbitrary jumble of events. Nor was it controlled by the will of some capricious Gods. This means the world could be orderly without being divinely run. Its order was thought to be intrinsic and internal principles of nature were thought to be

sufficient to explain its nature and its structure. In this way the pre-socratics became proto-scientists and proto-philosophers.

Answers to Check Your Progress II

1. The idea that these thinkers collectively brought something into the world, that is called as a scientific or proto-scientific attitude is gaining academic currency. Some scholars call these thinkers as the Big Bang of science. But it is naïve to lump all the Pre-Socratics together as if they were somehow identical. There is considerable diversity among them. We have seen that they range from shamans like Empedocles, mystics like Pythagoras, prophets like Heraclites to metaphysicians like Parmenides, philosophers like Anagoras and proto-Scientists like the Milesians (Ionians). Although, we might trace a strong variety of views and perspective among them, we can still find something common in them all. Indeed, we can say that they collectively invented Philosophy and Science. What do we mean when we say that they invented Science or Philosophy? Indeed, the Milesians brought something scientific in the world and those like Parmenides and Heraclites reflected upon their predecessors work and were therefore engaging in philosophizing.

2. The pre-socratic thinkers are proto-scientists but they lack the scientific rigor of modern science. We can trace many seminal attitudes of science among them. Their deliberate preference of rational, material, and mathematical explanation and their empiricism are certainly important features of modern science. The belief in an orderly and intelligible universe as well the basic conceptual terminology that they developed is even today employed by modern science.