UNIT 2 ORIGINAL UNITY OF PHILOSOPHY AND SCIENCE

Contents

2.0 OBJECTIVES

- To study basic human quest for unity that has given rise to philosophy, religion and science.
- To trace the origin of human knowledge to our quest for understanding: the self, world and God.

2.1 INTRODUCTION

In order to trace the meaning of the original human quest through philosophy and science, we first speak of humans as the myth-making animals. Once we understand myth in a positive sense, we can make use of our philosophical and scientific quest as emerging from our innermost sense of unity. For this purpose we use insights from the beginnings of philosophy, the Ionians who searched for the ultimate that is the basis of everything else. Then we look into the greatest scientist, ever lived, Albert Einstein, who painstakingly tried to formulate a unified theory of everything. Our argument is that there is a human quest for unity, out of which philosophy and science have emerged. So there was that original unity. Now though they follow different methods and have different goals, at the ultimate level, as human beings we use everything at our disposal – science, religion and philosophy – to open ourselves to that unity. Such a search for the original unity in fact promotes diversity and thus makes our lives really human.

2.2 MYTH, PHILOSOPHY AND SCIENCE: ORIGINAL UNITY

As we know, humans are part of large and complex cosmic tradition going back to about 13.7 billion years, when the Big Bang gave rise to the known universe of today! About 4.5 billion years ago the solar system was formed. Further, 4.5 million years ago humans (Homo sapiens) evolved. About 20,000 years ago Neanderthals would sit around the fire at night watching starry sky and listening to the sounds from far. They were trying to understand the world around them. They were trying to make sense of life, but more importantly, of death. How did dead people show up in their sleep, in their dreams? What could be made of their own impending deaths? In order to honor the dead person, Neanderthals buried their dead with flowers and beads. They also took care of the sick and elderly. In trying to understand death through ritual and ceremony, Neanderthals gave us their greatest gift: mythology. This endures till today though in different forms (Pandikattu 2009).

The primitive humans thought very little about anything but immediate things. They were preoccupied thinking such things as: "Here is a bear; what shall I do?" Or "There is a squirrel; how can I get it?" Until language had developed to some extent there could have been little thinking beyond the range of actual experience, for language is the instrument of thought as bookkeeping is the instrument of business. It records and fixes and enables thought to get on to more and more complex ideas. Primordial man, before he could talk, probably saw very vividly, mimicked very cleverly, gestured, laughed, danced, and lived, without much speculation about whence he came or why he lived. He feared the dark, no doubt, and thunderstorms and big animals and queer things and whatever he dreamt about, and no doubt he did things to propitiate what he feared or to change his luck and please the imaginary powers in rock and beast and river. He made no clear distinction between animate and inanimate things; if a stick hurt him, he kicked it; if the river foamed and flooded, he thought it was hostile. His thought was probably very much at the level of a bright little contemporary boy of four or five. But since he had little or no speech he would do little to pass on the fancies and fantasies that came to him or to develop any tradition or concerted acts about them.

In these questions of primitive thought, we must remember that the so called "lowly and savage" peoples of today probably throw very little light on the mental state of men before the days of fully developed language. Primordial man could have had little or no tradition before the development of speech. All primitive peoples of today, on the contrary, are soaked in tradition - the tradition of thousands of generations. They may have weapons like their remote ancestors and methods like them, but what were slight and shallow impressions on the minds of their predecessors are now deep and intricate grooves worn throughout the intervening centuries, generation by generation. Thus language enabled them to create myths and thus perceive meaning in their own lives.

The word "*mythos*" is related to the Greek meaning "to be spoken with the mouth". All myths are fundamentally, if not historically, true and lead to the highest of truths. The myths and their many facets have given birth to religion, mysticism, spirituality, philosophy or in short, to the different articulations of human quest for meaning. Myth is humankind's basic method of communicating our meaning

of the cosmos and answering the why and how regarding birth, life, death of humans and the rhythms of nature. Mythology lives and breathes in us. In other words, we live and breathe our myths. Myth constitutes our very existence. We have been imprinted with certain fears and faiths that have dwelt in our collective unconscious for thousands of years. Mythology is the language of the universe of rituals, ceremonies and symbols. They are the enactments of our desire to have mystical experience, communion with reality. With and through myths we bathe ourselves in the Mystery.

2.3 THE MYTH: A SPIRITUAL METAPHOR

The crucial fact about mythology is that it is a spiritual metaphor. Myth is a guidepost to a higher truth or understanding, which if taken literally destroys its original function and meaning. For example, the myth of Adam and Eve, is a myth describing how humans became conscious and further, conscious of evil. The story is that Eve convinced Adam to eat the apple and we were thrown out of paradise. A literal interpretation of this myth has led generations of people to believe women to be the cause for evil in humanity and think of their suffering in childbirth as a just punishment. By analyzing this myth exegetically and interpreting it, we learn that the serpent in the story in all cultures, with the exception of the Old Testament, represents wisdom, the feminine goddess, power and rebirth, because it sheds its skin. The tree is the Tree of Life and the World Tree found in almost every culture is understood as the link between the conscious and the unconscious, the under-world and upper-world. By eating the apple, Eve made the humans almost godlike. This myth might imply that the Divine is within us. This understanding of myth as elaborated by Carl Jung, Joseph Campbell or Paul Ricoeur, goes against the anti-historical or rational interpretations of myths, that was fashionable few decades ago. As opposed to this view we know today that we make myths and myths make us.

Campbell and Jung suggest that we create new myths because the creative act allows us to delve into and become aware of the unconscious which initially created symbols that have lasted a millennium and have bound us physically and psychically. As Campbell holds, the mythical image “lies at the depth of the unconscious where man is no longer a distinct individual, but his mind widens out and merges into the mind of mankind, not the conscious mind, but the unconscious mind of mankind, where we are all the same.”

The Purpose: Meaning-Making

Emile Durkheim, noted sociologist and mythologist, explained that myth exists as a social institution that orders rituals, economy, history and the meaning structures of the society. He described it as the unconscious of the society. In other words, myth is a global way of thinking through which all social agendas emerge. Joseph Campbell said that we are all living (or enacting) a myth and that we must figure out what our myth is, so that we are not forced to live it against our will. He also warns that a society that takes its myth literally is suffocating itself. Studying mythical symbols is one form of bringing back the wonderfully divine, if not mystical, experience of realizing that all life is connected, at the very least, on an unconscious level. Joseph Campbell gives four purposes to myth: 1. To awaken wonder by putting us back in touch with the child within. 2. To fill all corners or niches of an image with the Mystery. 3. To validate

social order. 4. To teach us how to conduct ourselves during the stages of our lives. We can further add: 5. Myths enable us to live the reality of contradictions meaningfully by giving us ideals to live by.

In summary, through myths we make sense of our reality. It provides us with meanings, enables us to organize even the contradictory experiences of our lives. It makes our lives bearable. It explains to ourselves our own experiences. It justifies our actions to ourselves and explains our failures and tragedies. Thus it basically has mediating and motivating functions. Myths also mediate the infinite through the finite. It situates us in the vast cosmic and divine background, wherein we can find the significance of our own selves. The puny, little human actions are magnified and enriched because of the cosmic and divine significance attached to it. They also motivate our actions. They enable us to live a meaningful life within a wider horizon of significance. It is in such a horizon that we are encouraged to act. Every action, originating from a mythical experience, becomes unique and infinitely more meaningful at least for the actor of the myth.

2.4 MYTH, PHILOSOPHY AND SCIENCE

The two narrations above are meant to show the similarity and difference between science and myth. True, for the contemporary persons, science provides us with the best knowledge possible. The primitive people used the best resources they had and came up with answers which did not quiet satisfy them, but still provided them with meaning in life and made them search further. In this process the primitive people gave us the myths, which are truly powerful in shaping our visions. None of us live according to the myths of these people. But we have our own myths: answers we give ourselves collectively and subconsciously when confronted with deep unresolved questions of life, death, reality and destiny.

As such modern humans do have our own shared myths, which most of the time we are not aware of. Only generations later, they will be able to look at us and point out the myths in our collective understanding. We do have our science, which explains to us many of the mysteries of old. Science provides us with the best explanation. But let us not forget that science of today may become the myth of yesterday. As such myth and science serve the same purpose of explaining the universe to ourselves, but at different levels. The methods they employ are different. The answers they come up with are also diverse. That is because they serve different domains of our enquiry. Science is primarily empirical and provides us with facts, while myths are based on the known facts and provide us with meaning. Such myths, when elaborated and rationalized become philosophy.

Thus there is a movement from myth to philosophy and to science. Myths are mostly factually not true but existentially meaningful. Philosophy tries to be factually true and existentially meaningful. Science attempts to be factually true and does not directly address the existential meaning. Myths provide us with intuitive and existential meaning. Philosophy gives us rational meaning. Science shows us empirical facts. Thus it is evident as human beings we want to know, to transform and to determine our collective destiny. As individuals and group, we aspire to be related to our common origin and work towards our common destiny, or all the resources at our hand: science, religion and philosophy.

Check Your Progress 1

Note: Use the space provided for your answer

1. What are the four purposes of myths according to Joseph Campbell?

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2. Do the modern human beings have myths?

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2.5 THE GREEK QUEST FOR UNITY

In this section we attempt to show that basically the Greek quest for unity, emanated from their inmost longing to be part of the larger universe – both epistemologically and ontologically. So we shall trace the deepest philosophical quest for unity as the central driving force for all intellectual and even anthropological enterprises. As is generally presumed, the earliest schools of philosophy in the West can be traced to the sixth century B.C. in Greece. Prominent among them were, first of all, the Ionian School, the Pythogorean School, the Heraclitean School, and the Eleatic School. Right from the beginning they had one quest in common: the search for one singular essence that explained all reality. Will Durant points out five unifying elements in the civilization of the Greece that kept all its scattered cities somehow connected: a common language, with local dialects; a common intellectual life, in which only the major figures in literature, philosophy, and science were known far beyond their political frontiers; a common passion for athletics, finding outlet in municipal and interstate games; love of beauty locally expressed in forms of art common to all the Greek communities; and a partly common religious ritual and belief.

Durant goes on to say that religion divided the cities as much as it united them. The city deity was believed to be the preserver, defender, and strength of the city. Just as the father was the priest in the family, the chief magistrate or archon was the high priest of the state religion in the Greek city. Polytheism was accompanied by anthropomorphic mythologies. Every craft, profession, and art had its divinity. Thus, polytheistic religion pervaded almost every facet of Greek life. Homer's Iliad and Odyssey expresses the view that the gods control all human events and the one on the side of the stronger god ultimately wins. In such polytheism, ethics mattered less. The gods themselves are pictured as slaves of lust and passion. There is no moral order since there is no single point of reference in the multiplicity of divinities. Each divinity is a point of reference in itself. Whoever serves that particular deity is under its patronage at the possibility of becoming

an enemy of another deity. Egotism, revenge, heroism, and valor are extolled, as noted by Domenic Marbaniang.

The shift from multiple points of reference to a consistent moral law, that is above even the gods and that determines the state of the world, seems to have first occurred in Hesiod. Writing sometime in the eighth century B.C., Hesiod dismissed the notion of fatality and of the gods as being morally inconsistent. Though the gods control nature, the moral order which is a product of Zeus' commands controls the structure of the universe and regulates its process of changes. Thus, Hesiod's writings can be called the transitional bridge between religious beliefs and philosophical thinking. It might have been this transitional venture of Hesiod that the Milesians undertook, indicating a substantial departure from the poetry (myth) of Homer and Hesiod and a movement towards a scientific temper (Marbaniang).

According to Will Durant, the predecessor to philosophy was a critical and sceptical outlook produced by motley of religions and cultures that intersected each other in the Greek metropolises. Athens was becoming a busy mart and port that attracted varieties of races and cults; thus, providing a context for comparison, analysis and thought. As Durant himself states: Traditions and dogmas rub one another down to a minimum in such centres of varied intercourse; where there are a thousand faiths we are apt to become sceptical of them all. Probably the traders were the first sceptics; they had seen too much to believe too much; and the general disposition of merchants to classify all men as either fools or knaves inclined them to question every creed.

Durant's speculative description of the Greek environment in which philosophy took birth may not be wrong. It is natural to reason that two opposing views cannot be both true at the same time. This points one to the inescapability of reason in searching for truth. The necessity of moral consistency might even be felt by the traders for whom fidelity matters much. On the other hand, people are seen as seeking to get nature back into their control from the hands of the gods by attempting to locate explanations for natural events in something other than the gods. Such a unifying singular was thought to be some kind of a primordial substance. As Durant writes, 'Men grew bold enough to attempt natural explanations of processes and events before attributed to supernatural agencies and powers; magic and ritual slowly gave way to science and control; and philosophy began.'

2.6 THE IONIAN SCHOOL

As Marbaniang outlines, European philosophy is born in the seaport town of Miletus, located across the Aegean Sea from Athens, on the western shores of Ionia in Asia Minor in around 585 B.C. This is why the first philosophers are also referred to as Milesians or Ionians. Ionia was a district of ancient Greece on the west coast of Asia Minor (present Turkey). It comprised famous and important cities like Ephesus, Clazomenae, Erythrae, Colophon, Smyrna, and Miletus. As Marbaniang notes, it is amazing to note how a religiously steeped Ioniaians, who had earlier on produced Homer the author of Iliad and Odyssey, should suddenly become very secular in its search for wisdom; thus, producing the first of philosophers in Western history.

However, as seen earlier, the quest for control over nature might have been one reason behind the search for some natural explanation of the universe. As such the Ionians were searching for a singular thing that was the essence of all reality. If this essential thing were rightly understood, then all the other things would also be understood. Thus, human being would be in possession of a knowledge that would serve as an instrument to both explain and control natural processes.

The first of these Ionian philosophers is considered to be Thales (624- 546 B.C.). Thales asked the question: What is everything made of, or what stuff are things composed of? His contribution to thought was the novel notion that though all things differ from each other in several ways, there is a basic similarity between them all and that the many are related to each other by the One. For Thales, this one thing that united all diversity and that was foundational to all physical reality was water. According to him, it is from water that everything proceeds and into which everything is again resolved. Following Thales, Aristotle in his metaphysics observes that most of the first philosophers thought the principles of matter were the principles of all things. In other words, the early metaphysicians were more concerned with the material cause of the universe than with any other.

That of which all things that are consist, the first from which they come to be, the last into which they are resolved (the substance remaining, but changing in its modifications), this they say is the element and this the principle of things, and therefore they think nothing is either generated or destroyed, since this sort of entity is always conserved, as we say Socrates neither comes to be absolutely when he comes to be beautiful or musical, nor ceases to be when he loses these characteristics, because the substratum, Socrates himself, remains. Just so they say nothing else comes to be or ceases to be; for there must be some entity – either one or more than one – from which all other things come to be, it being conserved.

Aristotle makes it clear that most of the first philosophers thought that the material cause was the one, indestructible, eternal substratum to all things. For Thales, this one, uncreated, indestructible, eternal substance or essence of all things was water. Aristotle opined that Thales might have got this notion from seeing that the nutriment of all things is moist, and that heat itself is generated from the moist and kept alive by it; that the seeds of all things have a moist nature, and that water is the origin of the nature of moist things (Marbaniang).

Anaximenes and Diogenes saw air as prior to water and as the most primary of the simple bodies. Hippasus of Metapontium and Heraclitus of Ephesus said that fire was the primary principle. However, Empedocles attempted to combine the above three with an addition of a fourth, earth, thus attributing finality to the four elements: water, air, fire, and earth. Empedocles argued that these always remain and do not come to be, except that they come to be more or fewer, being aggregated into one and segregated out of one. Aristotle, however, questioned this restricting of ultimate reality to material causes only and disregarding the effective cause and final cause of things. He argued that if material causes, like air or water, are the final essentialities, then the world cannot

come to be good or beautiful, and is thus devoid of any goal or purpose for existence. In his words:

…it is not likely either that fire or earth or any such element should be the reason why things manifest goodness and beauty both in their being and in their coming to be, or that those thinkers should have supposed it was; nor again could it be right to entrust so great a matter to spontaneity and chance. When one man said, then, that reason was present – as in animals, so throughout nature – as the cause of order and of all arrangement, he seemed like a sober man in contrast with the random talk of his predecessors.

The Ionian philosophers did not seem to consider the problem of the how or why of the universe. In terms of Aristotelian thinking, such metaphysics falls short of authoritative science because "the science which knows to what end each thing must be done is the most authoritative of the sciences…and this end is the good of that thing, and in general the supreme good in the whole of nature." Thus, according to Aristotle, it is not just the discovery of the material cause but also the discovery of the efficient and final causes that is important in this search for ultimate reality. This need to unravel the other causes manifests itself though naively in theories that regard elements like fire "having a nature which fits it to move things" as the first principle.

The basic drive was, however, to find out that one element that united and was fundamental to all of nature. This doesn't mean that there weren't some who seemingly posited a pluralistic foundation of the universe as can be seen in the later Thracian materialistic schools of Leucippus and Democritus. But even in the atomic theory of Democritus, the atoms are all made of the same matter though they differ in shape, size, weight, sequence, and position. They are minute, invisible, indivisible, indestructible, and eternal. The quest for the One cannot be evaded in latter thinking. The Ionians, thus, can be considered to initiate the quest for the One in Metaphysics.

In summary, the Ionian philosophers beginning with Thales searched for the one, fundamental, element or principle that united all of nature. The philosophers disagreed among themselves as to whether this first principle was water or air or fire until Empedocles decided to regard all three together with a fourth, earth, as the four elements out of which all things come. The next question, inevitably, was "what is that element that was the quintessence of the four elements?" The search for the One, thus, was inescapable. The One out of which the many proceeded was considered to be eternal. However, the early Ionians left the question of efficient causality and purpose out of their theories. Though some would not consider this to be a major problem at all, Aristotle thought this to be a real problem. How can chance produce the effects of beauty and goodness in nature? There has to be an efficient and a final cause of the universe. The universe cannot be a free lunch. This led Anaxagoras to conclude that the cosmos is the result of an eternal governing principle called nous (intelligence, reason) that brings order out of the chaotic sea of atoms in the universe. This, however, leads to two different eternal causes: the material cause being the atoms and the efficient cause being reason.

Thus, the quest for the unity in diversity of matter led to the quest for the efficient cause of all things in general.

The Ionian speculation of an eternal first material principle alludes to the following consequences, as summarised by Marbaniang:

1. Something cannot come out of nothing. Therefore, something must have eternally existed.

2. Something cannot produce its unlike; therefore, all things are made up of that something.

3. Thales (according to Aristotle's guess): All things grow in moist; therefore, water is the source of all things.

4. Anaximenes and Diogenes: Air is prior to water; therefore, air is the most primary of the simple bodies.

5. Anaxagoras: Matter is composed of infinite minute atoms which are chaotic in nature. Order out of chaos can only be created by mind.Therefore, nous (an eternal intelligence) is the author of unity and order in the universe. Since something cannot come out of nothing the material cause "atoms" are eternal. Since chaos is natural, reason must be the eternal author of order in the universe.

Consequently, the universe itself is materialistically eternal in Ionian philosophy. However, none of the Ionian philosophers were able to sufficiently explain how the primordial elements that they proposed were the basic foundation of the universe.

Check Your Progress II

Note: Use the space provided for your answer

1. According to Will Durant what was the predecessor to philosophy in Greece?

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2. The Ionian speculation of an eternal first material principle alludes many consequences. Name some of them.

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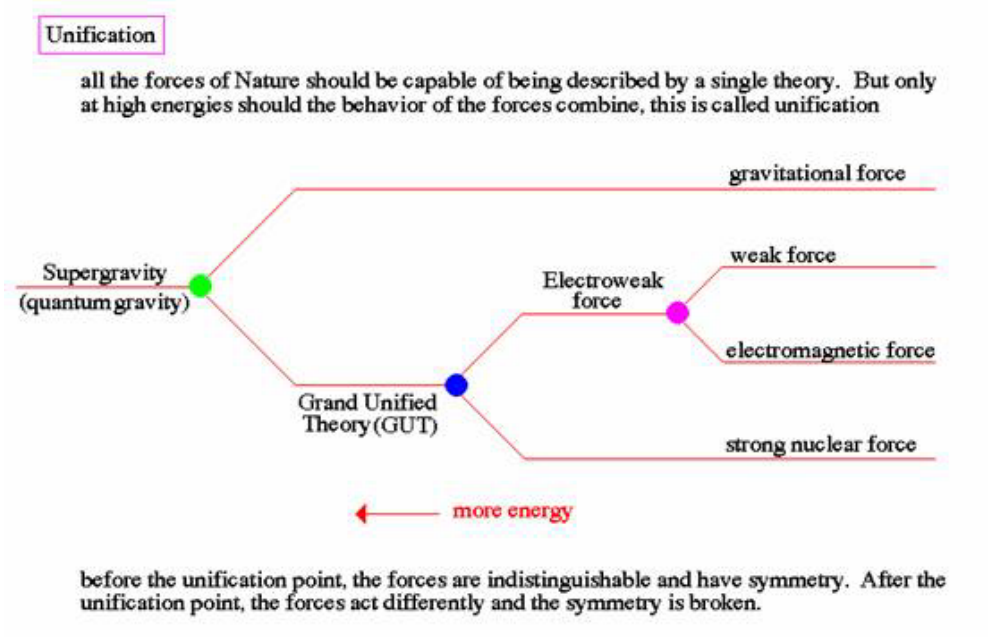
2.7 TOWARDS A GRAND UNIFICATION THEORY OR THEORY OF EVERYTHING

From the Ionians of ancient Greece we are making a tremendous leap to the contemporary scientists. We try to show that similar passion has been guiding the contemporary scientist to search for an ultimate theory that unifies everything. Contemporary physics of the early Universe is at the boundary of astronomy and philosophy since we do not currently have a complete theory that unifies all the fundamental forces of Nature at the moment of Big Bang. In addition, there is no possibility of linking observation or experimentation of early Universe physics to our theories (i.e. it is not possible to 'build' another Universe). Our theories are rejected or accepted based on simplicity and aesthetic grounds, plus their power of prediction, rather than an appeal to empirical results. Our physics today can explain most of the evolution of the Universe after the Planck time (approximately 10-43 seconds after the Big Bang). One of the reasons our physics is incomplete during the Planck era is its lack of understanding of the unification of the forces of Nature during this time. At high energies and temperatures, the forces of Nature become symmetric. This means the forces resemble each other and become similar in strength, i.e. they unify. When the forces break from unification (as the Universe expands and cools) interesting things happen and we have the present universe.

The term Grand Unified Theory or GUT, refers to any of several similar models in today's particle physics in which at high energy scales where all the forces are merged into one single interaction. The information about models of grand unification is obtained through indirect means. The Large Hadron Collider (LHC) being operated at CERN, Geneva, is such an attempt. It is a gigantic scientific instrument near Geneva, where it spans the border between Switzerland and France about 100 m underground. It is a particle accelerator used by physicists to study the smallest known particles – the fundamental building blocks of all things. It will revolutionise our understanding, from the minuscule world deep within atoms to the vastness of the Universe.



Two beams of subatomic particles called 'hadrons' – either protons or lead ions –travel in opposite directions inside the circular accelerator, gaining energy with every lap. Physicists will use the LHC to recreate the conditions just after the Big Bang, by colliding the two beams head-on at very high energy. Teams of physicists from around the world will analyse the particles created in the collisions using special detectors in a number of experiments dedicated to the LHC. There are many theories as to what will result from these collisions, but what's for sure is that a brave new world of physics will emerge from the new accelerator, as knowledge in particle physics goes on to describe the workings of the Universe. For decades, the Standard Model of particle physics has served physicists well as a means of understanding the fundamental laws of Nature, but it does not tell the whole story. Only experimental data using the higher energies reached by the LHC can push knowledge forward, challenging those who seek confirmation of established knowledge, and those who dare to dream beyond the paradigm. Unifying gravity with the other three interactions (electromagnetic force, weak force and nuclear force) would form a theory of everything (TOE). Grand Unification is reminiscent of the unification of electric and magnetic forces by Maxwell's theory of electromagnetism in the 19th century, but its physical implications and mathematical structure are qualitatively different.

2.8 EINSTEIN'S PERENNIAL QUEST FOR UNITY

Buried in Albert Einstein's mail one spring day in 1953 lay a letter from an ordinary student, a 20-year-old high school dropout named John Moffat. Two totally different persons! Moffat was an impoverished artist and self-taught physicist. Einstein was a mythic figure - the world's most famous scientist. In his later years, Einstein had become increasingly isolated from the physics community, refusing to embrace the strange but powerful theory of quantum mechanics—with its particles that are also waves and that exist in no specific place until they're observed. Nature, he argued, couldn't be so perverse. So for nearly 30 years he had pursued a quixotic goal: the creation of a unified field theory to describe all the forces of nature (Tim Folger). That was the occasion for Moffat's letter. He thought he could offer Einstein some constructive criticism. "I wrote him to say that I wasn't happy about what he was doing," Moffat recalls. And he was privileged to get a reply. "Dear Mr. Moffat, Our situation is the following. We are standing in front of a closed box which we cannot open, and we try hard to discover about what is and is not in it." That closed box is the universe, and Einstein has been trying his best to open it. But, according to many of his colleagues he had contributed almost nothing of importance to physics for almost 20 years, chasing a unified theory. Did he squander his genius by chasing vainly after an ultimate theory? Though that is the generally accepted view, at least a few physicists now argue that Einstein was far ahead of his time, raising questions that will challenge researchers for decades. Moffat, who later went on to become a theoretical physicist: "This, of course, is erroneous. Einstein never wasted his time." (Tim Folger)

Einstein's split with mainstream physics came at the very height of his career. In 1927, when he was 48, the world's leading physicists gathered at a conference in Brussels to debate an issue that remains contentious to this day: What does quantum mechanics have to say about reality? Einstein had won the Nobel Prize in physics for research that showed that light consists of particles of energy—research that laid the groundwork for quantum mechanics. Yet he dismissed the

new theory out of hand. At the conference, he clashed with the great Danish physicist Niels Bohr, starting a quarrel that would last until Einstein's death in 1955.

Einstein's work was not without promise, at first. He was attempting to unite the force of gravity with the force of electromagnetism, and the two forces are similar in many ways. Einstein spent the last two decades of his life refining this idea. At the same time, he tried to iron out what he saw as problems in his general theory of relativity. In cases where gravity was extremely strong, his theories broke down. Moreover, they seemed to permit the formation of what we now call black holes — objects of such enormous density that their gravity traps even light. "Einstein didn't like black holes," Moffat says. "The real motivation for generalizing his gravity theory was to see if he could find, as he called them, 'everywhere regular solutions' that fit the equations." Such solutions, Einstein hoped, would eliminate black holes entirely. So , as Moffart says, "Einstein went into denial, because he had invested so much time in this—years!" Near the end of his life, Einstein realized that he wouldn't live to complete his work. "I have locked myself into quite hopeless scientific problems," he wrote, "the more so since, as an elderly man, I have remained estranged from the society here."

In the 1930s, when Einstein began his work on a unified field theory, physicists believed that there were only two universal forces that the theory would have to unite: gravity and electromagnetism. They have since learned that there are two other fundamental forces as well, a strong force that binds together atomic nuclei and a weak force that governs radioactive decay. "Einstein defined what later became a fundamental problem in physics," says Carlo Rovelli, a theoretical physicist in France, as quoted by Tim Folger. After about fifty years, Einstein's once-lonely quest engages thousands of physicists around the world, most of them working on an ambitious physics framework known as string theory. But the researchers are still cautious. Moffat says that it is "pure hubris," to claim there is an ultimate theory of everything. "There's always something new on the horizon, and then everything starts all over again."

The general theory of relativity was developed in defiance of centuries of physics. It consumed Einstein for 11 years—from 1905 to 1916—and in the end was proved triumphantly correct. It's no wonder the memory of that achievement sustained him in later years. In 1953, when the letter from John Moffat found its way to Princeton, Einstein was still doing what he had always done—asking big questions and looking for big answers: looking for simplicity and searching for one unifying principle that grounds everything.

2.9 CONCLUSION: PHILOSOPHICAL QUEST

Philosophy comes from the Greek for "love of wisdom," giving us two important starting points: love (or passion) and wisdom (knowledge, understanding). Philosophy is to be pursued without passion and commitment, since it involves us totally. The primitive Neadnderthals, the Ionians, the contemporary scientists and Einstein, all of them had this goal: to make sense of our lives and of the world around us. This perennial goal could be attempted through different ways – philosophies, myths, religions and sciences. Because we are human, we just cannot cease to explore and question. Thus the passionate search of human beings everywhere to make sense of themselves in the world leads us directly

to philosophy and religion and indirectly to sciences. Thus the original unity calls us back to discover our own identity and sense of belonging in this universe. In this process we grow, evolve and discover meaning.

2.10 LET US SUM UP

We have seen how humans try to make sense of the world by trying to return to an original unity, which always remains an ideal. The search for rediscovering that original unity keeps us moving forward as human beings.

Check Your Progress III

Note: Use the space provided for your answer

1. What is GUT?

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2. According to many scientists Einstein had contributed almost nothing of importance to physics for almost 20 years. Is it true?

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2.11 KEY WORDS

Myths : Philosophically myths are stories, through which we make sense of our reality. It provides us with meanings, enables us to organize even the contradictory experiences of our lives. It makes our lives bearable.

GUT : The term Grand Unified Theory or GUT, refers to any of several similar models in today's particle physics in which at high energy scales where all the forces are merged into one single interaction. At this level, all the forces become one and so we have a grand unification of everything.

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