Essay

Worldviews, Paradigms and the Solar Age

Mathias Bildhauer*
Maricopa Community Colleges, U.S.A.

Introduction to Worldview and Paradigms

> *"All that we are is the result of our thoughts; it is founded on our thoughts and made up of our thoughts. With our thoughts we make the world."*
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> *—The Dhammapada*

> *"In the beginning was the Logos, and the Logos was with God, and the Logos was God.... All things were made by him: without him was made nothing that was made."*
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> *—The Gospel of Jesus Christ according to John*

It is nothing new to believe that thoughts and reason have a primacy over the material of experience in forming the world and we can find a number of examples. Plato in the fourth century BCE held that Forms or Ideas were constitutive of the world whose individual objects participated in them.[1] We also find what seems an idealist view in the first century Buddhist *Sutta Pataka* of which the *Dhammapada* is a part.

More recently, Immanuel Kant's *a priori* forms of intuition, understanding and reason formed an epistemological foundation and set of preconditions for the world as we experience it, understand it and live in it with our moral actions and our beliefs in what lies beyond it. Kant (1724 - 1804) drove a wedge between the known phenomenal world and the noumenal world as something in-itself beyond experience and while he assumed that the forms of experience and thought were the same for all, others pointed out that the world as something in-itself did no work and that the forms of experience and thought might vary among men. You

* **Correspondence:** 8150 N. Central Avenue, Unit 9, Phoenix, Arizona 85020 USA
Email: mathias711@earthlink.net

might even say that Kant had three worldviews and three corresponding worlds: those of science in the *Critique of Pure Reason*, of practical, moral action in the *Critique of Practical Reason* and of beauty and purpose in the *Critique of Judgment*. Nineteenth century Europe saw the relativization of thought and worldviews (Weltanschauungen). Whereas for Hegel (1770 - 1831), even through change logic and Christianity were absolute, with Hegelians and Wilhelm Dilthey (1833 - 1911) even these became relative to their time and open to historical inquiry. Dilthey seems to have replaced the metaphysics of Hegel with a doctrine of Weltanschauungen. He distinguished the physical sciences (*Naturwissenschaften*) and human sciences (*Geisteswissenschaften*), examining how in their historical existence humans constructed natural scientific, theological, philosophic and artistic concepts and forms which comprised three types of worldviews: those of naturalism, objective idealism and the idealism of freedom experienced in our lives.

Friedrich Nietzsche (1849 - 1900) held that our concepts were imposed on the flux and chaos of reality by men and that truth is nothing absolute or fixed but rather like artistic formations or representations used for living and domination. In his *Beyond Good and Evil* and *The Genealogy of Morals*, e.g., he critiqued European Christian culture and morality, distinguishing between the earlier morality of noble, life loving humans and that of the later Christian morality. Nietzsche portrayed Christian morality as the creation of the sick and weak, used in their resentiment against the strong and powerful. They substitued, on his interpretation, the concepts of good and evil for noble and base, in place of the person of great psyche and power put the self and life denying ascetic, and replaced the love of life with compassion for the weak. Nietzsche was more like a mole or miner than previous philosophers, as he dug beneath the surface of claims and positions to examine not only their rational arguments and precedents but their psychological and political motivations, previous historic and sociological conditions and any subterranean, physiological or biological conditions or precedents that might help confirm or dispell his suspicions of claims to universality, objectivity or disinterestedness.

One might say that the legacy of archeological explorations and genealogy concerning culture and thought lived on in the work of Michel Foucault (1926 - 1984). In digging through history, especially the periods he felt most comfortable with, Foucault unearthed a number of discontinuous *epistemes*, or positive configurations of concepts and ways of thinking and valuing, that give the possibility for the way those sharing the

episteme of an era and culture see the world. In *The Order of Things: An Archeology of the Human Sciences*, he describes three European *epistemes*. The first, in the sixteenth century, gave a view of the world as an ordered unity based on resemblances. With the seventeenth century there was a *classical episteme* that was based on representation, as our ideas were held to represent reality, e.g., and quantification through mathematics. In the *modern episteme* of the nineteenth and twentieth century, man was constructed as an object of thought and the human sciences of psychology, social studies and linguistic studies arose. Our modern views, e.g., of death, insanity and criminality gives us a constant stream of sick, insane and criminal persons. It is not that one *episteme* is superior to another, is nearer the truth or holds a privileged position; it is that one holds dominance at one period and then is succeeded by another. Foucault thought that our *modern episteme* of the human sciences might well be dying, and that the death of God announced by Nietzsche's madman also might be an announcement for the death of man as our *modern episteme* dissolves. Of course, neither Nietzsche nor Foucault had a privileged perspective from which to view their history, now or future.

There is another, twentieth century tradition related to the philosophy of worldviews in my mind. In American pragmatism there was the impetus to see thought as a way of meeting projects, so that the way we see and deal with the world is a result of those projects. W. V. Quine, sometimes called the Dean of American Philosophy, in "Two Dogmas of Empiricism" denied the sharp dichotomy of analytic and synthetic truths and the existence of unmediated experience. We can choose to hold various truths as analytic with sufficient adjustment in our system of thought or interpretation. What we experience already comes under the form of our thought and language. There is a conceptual framework in place that gives the possibility for facts and truths. He thus opened space for an advancement of pragmatism and a further investigation of alternative worldviews or conceptual frameworks. There are more ways to map things than things to be mapped and words are often ambiguous in ways, he arg ued, such that we aren't sure, e.g., that someone using a different language is referring to the same objects that we are when using a word like "gavagai." When, for example, we may be referring and take them to be referring to a rabbit they may be referring to rabbit parts or rabbit stages. The linguist Benjamin Whorf in *Language, Thought and Reality* hypothesized that a group's language is formative of the world they live in. Some might have, for example, a language based on processes and interactions

while others have one based on substances as fixed and independent objects. Thomas Kuhn in *The Structure of Scientific Revolutions* showed how scientific paradigms and views change through history giving rise to differing worlds of science.

The point is that a number of thinkers accept the position that what I'm generally referring to as worldviews and paradigms are generally not only important for our experienced and lived worlds but that these views and their worlds change according to differing societies, schools of thought, economic class, gender and periods of history. Thus the investigation of the role of thought and worldviews in constituting the world has itself changed from a metaphysical one in Plato, through Kant's epistemological one, to an empirical, historical and sociological, linguistic or even behavioral one.

Here, I'll accept the above position, at least in a general way, and also accept the view that some worldviews and paradigms are more helpful than others at particular points in history because of the problems and projects presented at that time. My goal is to describe what is meant by "worldview" and "paradigm," to allude to how some authors have approached the subject, and to give some examples of worldviews. Finally I'll describe and recommend what seems an emerging worldview, one that might make possible a "Solar Age." The *Dhammapada* claims that harmonious thoughts are followed by happiness.

General Thoughts Concerning Worldviews and Paradigms

In his essay "On What There Is," Professor W.V. Quine held that a curious thing about the ontological problem is its simplicity, "What is there?" "However," he goes on, "this is merely to say that there is what there is. There remains room for disagreement over cases; and so the issue has stayed alive down the centuries." Different schools of thought and ontology have existed in western philosophy and elsewhere. In Hinduism there are at least six classic *darshanas* or schools of thought on the constitution of the world, and among common folk everywhere there are disagreements. An atheist gentleman I know has a lady friend who is a very devout Christian. She always sees nature as God's creation, showing forth His wisdom and glory, while the gentleman views it as the product of a blind but interactive evolution. They certainly disagree on what there is and see the world differently. Each admits patterns and functions, yet their descriptions and explanations differ. She sees the world as depend-

ing upon something higher and he as something originating in the earlier and less complicated. Those who have studied physics and chemistry or biology seem to have a different relation with nature than those who have not but are versed in myths, charms and potents or stories, rituals and prayers.

The views of particular periods, cultures, communities and individuals may all vary in the sets of descriptions and values they use. The happy young person seems to see differently than the aged. There are healthy-minded and there are nonfunctional worldviews. No matter how much the views of present Jew and Muslim or Christian and atheist differ, I suspect they are more alike in science and in daily living than they are different when contrasted with the views of earlier *homines sapientes* or an earlier hominid species. This is hardly surprising considering our genetic constitution and primate history.

What is a worldview then? I propose the word be used to mean a shared set of assumptions, concepts, values, beliefs and practices held by a group or culture. Their descriptions give us how the world in general generally hangs together. A worldview serves as background to our experienced, thought about and lived world. It is in place even before facts, at least on the epistemological level and during times of relative calm and stability. We must have shared ideas of objects, colors and shapes before we can claim or decide the truth of judgments about balls being red or marbles being round. Whereas once scientists saw combustion as caused by phlogiston, since Joseph Priestley's 'discovery' of oxygen we see combustion as rapid oxidation and have forgotten about phlogiston. Or is it even that combustion itself is something different now, might we say? In the sense of supplying backgrounds for experience, tests and experiments, worldviews are prior to facts. How we understand what ideas or concepts are is a further question. The unquestioned acceptance or conscious adoption and use of a worldview gives unity and meaning to the world. We mostly in our usual dealings assume a constancy in nature and that other persons exist; we have concepts of physical objects like horses, stones, trees, bottles; we positively value predictions and honesty; we make agreements and wear clothes to many events; we judge Abraham who believed in his God, Gautama the Buddha, Socrates the philosopher, Jesus the Christ or someone else as a good and exemplary person; we use light as a sign of deliverance and understanding, water as a sign of cleansing. If another culture did not make the assumptions we do, use the concepts we do, then I think they would have a different worldview and even be living

in a different world. How different is an issue that we'll leave for another time.

Each worldview has, it seems, associated exemplars and symbols. These are each called paradigms. The exemplars may be persons or achievements. Perhaps Odysseus, the resourceful and cunning hero, served as one for Hellenic aristocrats. Jesus serves as an exemplar for Christians, Gautama for Buddhists, Napoleon for elements of early 19th century European society. They are models which others can admire and emulate. There are also exemplars that are achievements, such as Copernicus' reconciliation of observed celestial movement with a heliocentric view, or Newton's classical mechanics, laws of motions and reconciliation of the celestial laws of motion with the earthly ones, or Norgay and Hillary's first scaling of Mt. Everest. Symbols are also a type of paradigm, e.g., as pictures or metaphors in terms of which we often think or come to see the world. Rene Descartes was taken with mechanical clocks and we came to see much of nature, including the solar system, and even the human and other bodies as mechanisms. Bohr gave us a picture of the atom with set orbits in somewhat similar terms. In religions we have mandalas, mantras and mudras acting as symbols. Symbols seem to capture the paradigm or even a worldview and give it a certain suggestive or efficacious power in our thinking and lives.

Worldviews may vary according to time, as pointed out by numerous 19th century Hegelians and others. In the 1960's, Thomas Kuhn mapped some of the changing worldviews and paradigms through the history of scientific changes and revolutions. Worldviews may also vary by culture and civilization. They are not easily mappable but seem to overlap through history, from group to group and even in an ill defined hierarchy. No matter if we are atheist or pious believer, we share more of a similar worldview than we sometimes care to admit, or else we could not argue or even understand one another. We need common concepts and assumptions and at least logical practices to be able to argue.

Scientists in different disciplines may have trouble understanding each other but are often able to translate to a commonly understood language and set of rules. Speaking abstractly, those with differing paradigms, as happens at a time of crisis, also usually have enough in common so that they can argue. Due to the overlapping and sharing, there can be adjustments or even changes to worldviews that come to be accepted across a discipline or disciplines. Changes in worldviews and paradigms at one level or place can cause changes at other levels and places. Since there are

invested political, social, economic and personal interests in worldviews the adjustments or changes may come only with conflict and difficulty. This can happen in theoretical physics or in the more practical matters of energy and fiscal policies, and the atheist gentleman and his lady friend have had some arguments with the issue undecided between them.

Two popular examples of those dealing with big-think and big-picture outlooks are the authors Alvin and Heidi Toffler and Fritjof Capra. The position I've outlined is similar, e.g., to what the Tofflers described as waves in *The Third Wave*. Their three waves are: the agricultural, the industrial and the third wave characterised by electronic, information technology, pictured in turn by muscular labor, the factory and the Internet. Each has its outlook and ways of life. A separate *coda* or underlying set of rules and principles runs through each of these waves like a repeated pattern, according to the Tofflers. Thus in the industrial age we had: standardization of procedures, work and education; specialization; synchronization centralization of capital, materials and production; concentration of energy and population; maximization of almost every thing through big runs of produced goods and valuing of the big, bigger, biggest; and concentration of power in hierarchical systems. The patterns of each wave in part can be accepted as describing its general, cultural worldview that runs through life in its many parts or spheres. You might even say it helps determine the world of that culture.

Examples of Worldviews

There have been notable shifts in worldviews throughout history. Karl Jaspers and others referred to the Axial Age as a time roughly from 800 to 200 BCE when in cultures around the world the outlook was changing and major human figures existed. Generally there was a shift toward a greater valuation on rational thought, individual persons, social ethics and self-consciousness and interiorization. In Greece, figures like Hesiod and Thales helped the movement from *mythos* to *logos*, from a religious outlook to a more scientific and rational one. In China, Kung Futse and the reputed Lao Tse crystallized schools of thought and life that gave ways to obtain harmony and balance for individuals and the state. Zoroaster reformed a polytheistic and ritualistic Aryan religion with the central notion of ethical monotheism. In northern India, Siddhartha Gautama, the Buddha, rejected Brahmanism, and much of the metaphysics of the Upanishads, leading a quest for personal self-reliance and enlightenment.

The Jewish prophets brought new depths to religion, making it more internal and moral. All of these might be said to comprise changes in worldviews. But it is the more recent and presently occurring shifts that concern us.

In addition to the Tofflers' approach, another shift has been described by the physicist, social critic and environmental advocat Fritjof Capra in *The Turning Point* and elsewhere. He portrayed two worldviews, two Weltanschauungen, and paradigms. One was the Cartesian-Newtonian view that established itself as early as the mid-seventeen century, with the paradigm of the philosophy of Descartes crowned with the classical physics of Newton having as its symbol the mechanical clock. In it, western man had come to see the world and his own person in a twofold way, a dualistic way of spirit and matter. This view was overcome in part for many in the developed world by a newer view, one Capra viewed as an ecological view of the world and man that was marked by the newer views of science arising primarily from the newer physics. The movie "Mindwalk, " which urges us to adopt Capra's view, offers the symbol of a tree open to and effecting its environment. Main figures of the later worldview include Einstein, Heisenberg and others including Hazel Henderson. Somewhat like the Tofflers, Capra traces the effects and influences of the worldviews in major areas of our lives including economics and medicine.

Of all the possible Weltanschauungen and paradigms, I'll choose two sets as examples. One member of the first set is the Cartesian-Newtonian worldview established by the early eighteenth century and having as a symbol or paradigm the clock, the other is a Postmodern view that arose in the mid-twentieth. In the first there were the assumptions of a god who made the world and was resting, the existence of corpuscular matter and spirits as independent and separable substances, that one thing or state of affairs could effect another, that the laws of logic and mathematics were reliable and that nature was rational and knowable. Truth was seen as representational and based on fundamental laws or axioms. Even if humans didn't have all of the truth, it is cumulative and we are approaching ever nearer to the final truth. Western man had come to see the world and his own person in a twofold way, a dualistic way of spirit and matter. The spiritual world of God, the soul and freedom on the one hand and on the other the material world as the mechanistic universe of classical physics that described the laws of the celestial and earthly bodies including the animal and human ones. Time and space were universal, absolute and uniform. The physical world was not only mechanistic but also determin-

istic so that it was commonly believed that if we could only completely inventory the state of nature at a particular time, through the laws of nature we could in theory determine its state at a latter time. God had caused the world but then with the laws of nature his causation was no longer necessary in the physical world except perhaps to fine tune it from time to time. Indeed Descartes' method of thinking and Newton's science were fine paradigms and the clock served as a suggestive symbol of the world.

The Cartesian Newtonian worldview had changed an earlier view and is being overcome in part for many in the developed world by a newer view of the world and man that is marked by electronics, technology and newer views of science arising from neo-Darwinism including Bio-genetics, Ecology, Relativity, Uncertainty and Chaos theories, particle and matrix physics and the general postmodern mindset in philosophy, literature and the arts. You may call this the Postmodern or the Ecological worldview. Main figures include Darwin, Einstein, Heisenberg, Wittgenstein and Nietzsche. This view or set of outlooks was established by the mid-twentieth century. It assumes that truth is not final but relative to the time and project undertaken, that gods are culture bound, that no text is absolute but a remark or set thereof about a previous one. Organization is seen as distributed and growing from lower to higher. It holds different notions of non uniform space and time, that matter is not as we thought but is interchangeable with energy, that all is not determinable but influenced by chance and chaos, that organisms are of another type of system than mechanisms, that physical and spiritual are not independent and separable. For some the symbol or paradigm for this view I suggest is a growing plant. I see the recent mapping of the human DNA under Venter and Collins as a prolongation and fruit of this view. For others the symbol seems to be the Internet as a combination of electronic hardware, software and humanware as a distributed rather than hierarchical system. While teaching a course on the future, I'd tried to capture these two worldviews in a two column table which is included at the end of this essay.

The second set of contrasting worldviews is closely related but cuts somewhat differently than the above pair. It harks back to Arthur O. Lovejoy's Great Chain of Being and is contrasted with the "Tree of Life. " In the William James' Lectures at Harvard University in 1933, Lovejoy traced what he called the *Great Chain of Being* intellectual worldview from Plato (427 - 347 BCE) through Friedrich Schelling (1775 - 1854 CE).

The Great Chain of Being view existed prior to the Cartesian Newtonian mindset or industrial culture. It goes at least as far back as Plato. In the seventh book of the *Republic*.

Plato presented the entire world as ontologically rank ordered. Think for a moment about his analogy of the cave. Inside the cave is the world of shadows, images and changes and outside are the unchanging and more real beings of mathematical constructions, Ideas or Forms, and finally at the highest level the Good, as symbolized by the sun which gives light, life and being to all that is. This metaphysical perspective influenced much of the philosophic and other thinking of the western world, including its Christian theology which applied characteristics of the Good to God. Indeed, this at least partial identification of Being and God was later referred to by Martin Heidegger as onto-theology.

Lovejoy gave three principles of this worldview: plenitude, continuity and hierarchy. The Good or God being fully perfect fills the world with a plenitude of perfection so that all possibles are brought to actuality, the world being all the better the more things it contains. While Plato's student Aristotle did not accept the principle of plenitude, he did contribute that of continuity. Nature abhors a vacuum, you might say. All lines, surfaces, solids, motions and time and space are continuous and not discrete. In living nature, one natural kind of thing shades off into another without clear and discrete lines of demarcation.

There is, finally, a hierarchy among beings and types of beings. The Good or God is most perfect and each other being lacks some possible perfection that is possessed by the Good or God or yet another being. Thus on the metaphysical, zoological and psychological order there is a gradation or hierarchy from beings with the most privation and least being to that of the most being and no privation. It was thought that the higher might cause the lesser, but not the reverse. Thus the Good or God brings into being the world and its myriad things but not the reverse. You can see this mindset in the Hebrew book *Genesis* and in Plato's *Timaeus*. Lovejoy traces the influence of this worldview in western thought from the Greeks to the point where he sees it starting to unravel in the philosophy of Schelling in the nineteenth century, due largely to the tension in the early conceptions of the Good and God and dissatisfaction with Hegel's idealism. Schelling held God not to be transcendent, eternal and unchanging (or the play of ideas or essences) but a historical, actual force working out his evolving creation in the world.

Taking the place of the Great Chain of Being is a more naturalistic view, that of the Tree of Life. Whereas the Copernican Revolution in the

sixteenth century was an axial event for the rise of modern physical science, it seems that Neo-Darwinism which started with the *Origin of Species* in 1859 is proving an axial event for our present thinking and how we shall think for some time. Daniel Dennett compared Darwinism to the fictitious universal acid that eats its way through any container, and dissolves all it touches making its way through to the other side of the earth. He calls Darwinism a dangerous idea. Most likely it will help dissolve the Great Chain of Being view, at least in many minds for whom the Tree of Life view takes its place.

The important matter is not that these views disagree about facts. Did a god create the universe or did the universe in its wealth if not plenitude of variety and order evolve? It seems that these are two competing approaches to the world and our view of it not only differ in how we see it but how we seek to explain it and relate to it practically. Do we gain our unity and meaning best with the Chain of Being or Tree of Life worldview? In other words, at issue for many is the question not of fact but of which view is the best for life for someone or a group of people in the present and future?

The view given by Neo-Darwinism and some other forms of evolution theory, I'm terming the Tree of Life view. It sees the world as an evolving, growing thing or interrelated set of things that have developed from one system to another through time, generally from the less to more complicated, with discontinuous motions and variety and no absolute criteria for rank. In other words, the tree started with the basics of elementary physics or astrophysics, developed what we term elements and minerals and life forms and variations and species and societies and so on to forms we can not yet foresee. I'm sure you are familiar with the general evolutionary perspective and even if you accept it there may be disagreements over the details or larger issues. Is there is any intelligence, purpose or finality to the process? At what point does purpose enter? Can the view be extended to physics and chemistry? Does it apply to social forms and behavior? To ethical, moral dispositions and codes? To the way the stock market behaves? Did God use the laws of evolution to further his work or will a form of evolution theory be a totally universal acid that will convincingly dissolve the notion of God? Or will the notion of God change even more?

My twofold thesis shifts the concerns and claims a new worldview and set of paradigms are coming into prominence and that they will prove useful and worth adopting. It is what I call for the lack of a better phrase "The Solar Outlook" with the sun and its galaxy or a sunflower as the

paradigms.[2] In this view the Sun is the center of our system which is one of many actual and possible systems but the one to which we are committed.[3]

The Solar Age

> *"Sometime too hot the eye of heaven shines, And often is his gold complexion dimm'd And every fair from fair sometimes declines By chance or nature's changing course untrimm'd. Sonnet XVIII, Wm. Shakespeare "O Sun, great Oriental, my proud mind's golden cap, I love to wear you cocked askew, to play and burst in song throughout our lives, and so rejoice our hearts. "Prologue."* (Kazantzakis, 1958)

There are cycles of necessity when it's time for something new, time for a new axis. This may be such a time since it seems we are threatened on several fronts. Are overpopulation, poverty, pollution, climate change, energy crises, injustices toward and oppression of peoples matters of concern? With the passing of older worldviews, are acceptable forms of spirituality and meaning disappearing from our lives? On the environmental front we seem threatened by momentous climate changes, and possible infectious epidemics. Economically, the era of cheap energy based on the utilization of fossil fuel may be coming to an end without our having developed viable alternatives. Spiritually, we seem threatened by nihilism and the disvaluation of man to the level of a commercial commodity. Alternatives are offered us that seem reactionary or just too fantastic or fanatical. Maybe it is time for something new. I'm proposing that there is a new worldview emerging and that it should be explored and furthered. It is more naturalistic than the Great Chain of Being, more inclusive and far reaching than the Tree of Life. This new view may have two faces like that of Janus, one that looks back to the past and the other that gazes into the future.

There are old and new solar paradigms. In my own life I came to see this in a simple way. I had hiked with a friend and one of my children into Sycamore Canyon in central Arizona near the Tuzigoot ruins one early spring. We made our way north from the Verde River along the fast flowing creek that was overflowing its banks due to the spring melt-off of snow in higher elevations. The walk was more difficult than we'd expected and by evening, as the sun sank below the western rim of the canyon and darkness rose from the canyon floor, we were exhausted. So we spread our sleeping bags on a sandy bank under the low spreading branches of

some trees and quickly went to sleep. However, deep into the night it began to snow and we had no tent and the branches only kept the snow off us for an hour or so. All the wood around was too damp to start a fire and by morning we were chilled and cold, shivering and shaking from the cold and wet. In the early light, I took my daughter and we climbed up out of the canyon to the east to gather the first rays of the sun. There, on a rise above the canyon, we stood and it was only a short time until the sun rose above the eastern hills and soon its warming and lighting rays fell on us. Only then, we looked down and saw three petroglyphs of the sun symbol on the rock where we stood. They were likely about eight hundred to a thousand years old, and we wondered if perhaps the inhabitants of the canyon from that age had not etched them on an early and chill morning thankful for the sun energy and light.

Solar symbols and paradigms are classic and wide spread. The Greeks had Helios as the nature god who rode each day in his chariot drawn by four horses each day rising from the east and setting each evening in the west, a god who knew all and upon whom one would give oaths. There was also the Olympian god Apollo partly as a sun god, and the Middle Eastern Mithra taken by Roman soldiers and developed in the empire as a sun god and object of worship in myth and ritual. It would be interesting to trace the evolving role of the sun and thoughts about it in Western civilizations and life through its Mythological, Classical, Medieval, Cartesian-Newtonian, and Postmodern ages to that of the Solar Age Weltanschauung. Just think of Apollo and then Plato's Book VII of *The Republic* where the sun serves as the symbol in his ontology and epistemology of the source of all being, life and understanding. Of Christians' identifying Jesus with the sun symbolically. In other cultures, we also find the sun as symbol or god in the Buddhist divinity Amidahba or Amida and Shinto's Amateresu. The Aztecs had Huitzilopochtli, and the Cherokees the Sun as the young woman who lived in the East and apportioned goods. Maybe someone has already written such a book.

In southern Arizona atop a mountain on the reservation of the Tohono O'odham and with their permission, an array of optical and radio telescopes searches the skies for spatial phenomena including the possible signs of other intelligent life forms in the universe. If our atheist friend and his pious lady friend were to visit the solar telescope there, they might each like what they'd find. The one would learn more about a region of nature transcendent from our planet. The other might see the creator god and the order of his mind presenced or reflected in the sun and space.

A knowledge descendent of Nikolai Kopernik might tell them both more about the sun. He might tell them that on the actual, natural, physical plane, the sun is impressive enough. It's the center of our solar system but a somewhat ordinary star among the perhaps 100 billion in our galaxy. It comprises about 99.8% of our solar system's mass. Its temperatures range from 5,800 K on its surface to 15,600,000 K in its core. As a result of nuclear fusion reactions, it produces 386 billion billion megawatts and 5, 000,000 tons of gamma radiation per second. It not only produces light and a strong gravitational field but has a magnetic field that extends far further than the ninth planet Pluto which is itself 5,913,520 km distant. There is also the solar wind comprised of streams of mostly charged electrons and protons that extends out from the sun into space.

At an estimated age of 4.5 billions years, the sun is expected to last as an increasingly brilliant star for another 5.0 billion years at which time it will expire having exhausted its hydrogen, and the earth will die along with it. If any humans or their successor species survive, they will have had to sail on before the event.

As a star, the sun is the type of body from which the material of our earth and indeed our own selves are comprised. We humans, like other organism, are made of exploded star stuff, organized and evolved largely with energy from the sun. The myths of former times had a sort of truth to them that their creators, transmitters and hearers could not dream of. We have new truths: perhaps we can construct new myths.

The Solar Age worldview can contain many dimensions, mythical and rational. First there is the technological. The sun is the source of energy as renewable and distributed on earth and even in far reaches of space. As a large star it is a source of gravitational fields and energy as propulsive for the planets, comets and space vehicles of intelligent life forms. Its gravitational field pulls the planets and other objects toward it and determines their orbits. Our new craft will move through long spatial distances efficiently propelled by the solar wind. It is a navigational aid not only on our seas and land but throughout a significant portion of space. It lets us know where we are and which way we are going. It is an energy source in a number of ways. In addition to solar energy from light through passive heating and photo voltaic cells, the way the sun produces energy is also being studied so we may produce energy in similar ways using energy cells and electro magnetic fusion. Then too the winds are caused largely by the heating of the earth's surfaces by the sun, so that wind energy is indirectly attributable to the sun. The tides are caused by the gravita-

tional fields of the sun and moon and so here too energy is attributable to the sun. In sum, the sun can stand at the center of much of our technology and energy.

There is also the economic dimension since the energy that is obtainable from the sun will change the way energy is harnessed and distributed. There will be new companies manufacturing photo voltaic cells, fuel cells, heating and air conditioning units driven by sun power, light and magnetic generation systems. Solar power and technology may help redistribute wealth in a more equitable way since it can be highly distributed, enabling the poor nations of the world and their people to have many comforts, amenities and capabilities not now available to them. Nikola Tesla is said to have first thought of harnessing energy for the improvement of human lives when as a boy in Lika, where his father was a Serbian Orthodox village priest, he saw a photo of Niagara Falls. Later together with George Westinghouse this extraordinary man did harness energy with a hydro electric plant generating and distributing alternating current. At the present time the production of solar energy is about twice as expensive per kilowatt hour as through conventional centralized means like those of Tesla and Westinghouse or those using fossil fuel or nuclear power but is expected to drop with research and development. Perhaps it would make sense to fund research and development projects using solar energy and fuel cells especially for poor and developing nations since in the longer term all would gain.

In the spiritual dimension, the sun will be present as metaphor for the source, center and goal of spirit much as the onto-theological notions of Being and God were. This will be both religious and metaphysical: light will be seen as energy and as one of the two principles of everything that is. I would not be surprised to see, in the coming century, Temples to the Sun and there may even be some literalists and fundamentalists who will worship it again. We could easily reintroduce celebrations of the solstices and equinoxes grafting them onto such festivals as Christmas and Pascha. I've read that Copernicus sacralized and deified the sun, but have not discovered in any detail what a holy and godlike sun meant to the Polish priest and scientist.

There is the epistemological dimension. Nietzsche likened the condition of western civilization upon the death of God to the earth being unchained from its sun and plunging in darkness without there being any longer the orientations of up or down. "Are we not straying as through an infinite nothing?" Now, following the postmodern lack of foundations

and absolute truth, we can commit to at least one truth, with our shared evolved life in the galaxy, perhaps not as the universal truth but as our sun encircling human truth to grasp firmly and with hope. Truth becomes a shared vision from a shared life even if other truths are in theory possible. There are other galaxies and other worldviews with their truths. The truth is that which we can agree upon as the best life to bring about in view of our present problems, those values we share and what we will to hope for.

You might even relate the sun to social ethical thought. It can be used to supply energy in a more equitable way widely over the earth and in space. As we plan for and conduct space travel in our galaxy we may come to see ourselves as citizens of an earthwide commons with global and humanwide common goals. There is some hope that this would contribute to an outlook promoting global justice and order and would help eliminate the tribal atavism we have witnessed in the European Balkans, the Congo and parts of Asia. There is the danger that a larger powerful nation might militarize space bringing a new meaning to big brother and sky father. Yet, there's no doubt that as the earlier photos from space of the blue planet earth gave us a new perspective on our dwelling place, photos and other images from still further in space can give us a wider perspective on our place in a grander scheme. The Copernican shift in perspective was just one turn of the spatial kaleidoscope in which the sun appears.

It's written that nothing is new under the sun; perhaps this is not really a new view or new paradigm at all. You might point back to Helios, Apollo and Plato's *Republic* and some relatively old Middle Eastern and Meso-American religions. Or you may think of Nikola Tesla and his search for energy, and the young Austrian Moesl who has a solar political party, and Nikos Kazantzakis' *The Odyssey: A Modern Sequel*, as well as of modern physics' occupation with light and energy. I think that the science, engineering and technology that we have developed in the century just past, and the projects we are now conducting and will conduct, make a transformed view of the sun and our relation to it possible, and that it is one that can carry us forward with advantage. Some recent or yet to be performed research together with the first circumnavigation of the sun will serve as paradigms of achievement. For a time these achievements will be fruitfully applied. Like Janus, we need those two faces, one looking into the past and the other into the future. Understanding our precedents gives meaning. All the while, we may well become quite positively heliotropic following Helios through or across the heavens.

That is why the sunflower might serve as the paradigmatic symbol, as a living growing thing which is centered upon the sun as it turns its multiple sun-like heads on its single stem each morning from east to the west by evening using the energy and knowledge supplied by the sun. Perhaps too we or someone will see the seeds born on solar winds promulgating organic, evolving, intelligent life forms. Of course, this will not be the final way to see the world or the final world but another turn of the kaleidoscope.

Notes

1. Marx and Marxists may object that ideas do not have primacy at all but develop from and are founded upon the means of production and distribution. I would argue that, although this may be the case, once the ideas and worldviews are established and so long as there is a sufficient degree of stability an epistemological and methodological primacy holds.
2. There is no doubt that the phrase "Solar Age" and many of these ideas have appeared earlier, e.g., in Fritjof Capra and Hazel Henderson. I believe that I've set them in a somewhat wider context of intellectual history and given them a new twist or two. Hopefully we can further develop the ideas and valuations.
3. We can ask the question why shifts occur in worldviews. There may not be just one cause or reason. In science, e.g., there can be times of crisis when new discoveries or phenomena can no longer be efficiently explained or deducted from the old theories and methods. In such as music, painting and poetry, I suspect that masters of the art come to a point where the paradigms cannot be improved upon and so new forms are introduced. In our shared lives, we may come to points of crisis where our old ways of looking at and dealing with things are contributing more to the problems than to solutions. And then sometimes we may just be bored and ready for something new. Again maybe there is monetary, political or other gain from introducing new thoughts, values and practices. Probably there are also other ways in which views and paradigms shift.

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Appendix

TWO WORLD-VIEWS:
Mechanistic/Deterministic, Cartesian/Newtonian or Modern

———about 1660 - 1950 ———————
Contributors:
Physics: *Isaac Newton* (+1727)
Philosophy: *Rene Descartes* (+1650)
Politics: *John Locke* (+1704)
———————————————————

Characteristics -
Views the *world as a machine* like a clock
Linear causality is a prime assumption
Dualistic - Physical and Mental Beings are separable and have different characteristics (Also matter and energy, time and space.)
Deterministic - given the conditions and laws of nature we can determine future states
Natural Kinds are found and explained through spontaneous generation or creation.
Absolute and Objective - truth is one and the same everywhere for everyone
Foundational - There are foundations to knowledge and truth: axioms in math and logic, absolutes in physics, a basis for morality
Universalistic - Time and space are uniform and the same in all of the universe - laws are the same everywhere at all times
Hierarchical systems predominate with control from "above," from God or the mind. Mainframes and authoritarian systems.
Analytic - a system can be best understood by isolating it and analyzing it into its smallest components
Representational - our laws and ideas represent a world which exists outside and independent of our minds

Evolutionary/Open Systems or maybe even *Post-Modern*
————about 1950 on ————
Contributors: Physics: *A. Einstein* (+1955),
W. Heisenberg (+1976) Philosophy: *F. Nietzsche* (+1900), *L. Wittgenstein* (+1951)
Biology: *Charles Darwin* (+1882)
Politics: *Karl Marx* (+1883)

Characteristics -
Views the *world as an evolving thing*, maybe even as an organism
Causality is multivariate and *shows reciprocity*
Holistic - the physical and mental are interrelated and to be understood together. Likewise with matter and energy, time and space.
Probabilistic - quantum physics and chaos theory show we are dealing at best with probabilities
Evolution marks a process of gradual species development through mutation and selection.
Contextual - facts are embedded; truth/time/space /values are relative to the context and observer
Non-Foundational - systems are matrices that depend on coherence and interrelations, various systems may be chosen
Relativistic - Time and space are relative, truth can be relative to its where and when

Distributive systems are common and more complex designs and systems are explained from "below". The Internet and flat organizations

Expansive - systems are open to their environments and components are not understood in isolation

Pragmatic - our laws and ideas depend on our projects in the world: "minds and the world form the world and minds" (Hilary Putnam)