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Science, Art and Astrology

Penelope Sitter

Abstract

Contemporary discussions of astrological theory consider questions about the nature of horoscopic astrology. The question arises, for example, whether horoscopic astrology is a science, an art, or something else. This paper focuses an aspect of what horoscopic astrology is and how it relates to art and science. Tradition, theory, and practice suggest that practice of the arts instills science. The modern Western paradigm would confine science to modern technology, and would confine scientific method to the method that governs the practice of modern technology. In the view the paper states, the modern paradigm—a paradigm that elides the very possibility that astrology reveals the real world—is founded in modern technology and its practice. The paper argues that what modern technologists—usually termed "scientists"—do or discover is not properly accorded status as the sole modern instance of science or the sole means to knowledge of the real world. Modern technology is an art whose proper practice establishes the method and sets the rules for the practice of modern technology. Neither modern technology, however, nor any other single art, properly establishes the method and rules for all arts whose practice instills science. The paper considers the Indo-European root of "science" and *scientia*, a root that suggests that science is discernment of the world's parts and categories. From the point of view taken in the paper, horoscopic astrology is an art whose practice reveals the real world, whose theory explains it, and whose model represents it. We use horoscopic astrology to understand the ordered categories of the manifest world, and we practice it to reveal and work with self and world from within both. In the view stated in the paper, horoscopic astrology is an art whose proper practice instills a fundamental science of the manifest world.

Introduction

Current and ongoing projects to uncover the great and disrupted tradition of horoscopic astrology[1] as it developed in the Middle East and the West are enriching contemporary astrological practice. The project to reconstruct and revivify practice that accords with astrological tradition, fractured though it is in the West, benefits greatly by consideration of some foundational things about astrology, its method, and its practice. We need to know and be able to state what it is to do astrology. We need to be able to say what it is to understand the world with use of an astrological frame. We need to be able to speak of what it means that we can look into and through the frame of horoscopic astrology to see a wonderfully coherent, meaningful, dynamic, communicative, and soul-forging world.

Contemporary theoretical considerations of astrology may discuss whether astrology is an art, sacred art, science, divinatory method, occult practice, mantic art, archetypal schema

of cosmos, therapeutic resource, religion, or a combination or variety of those things and perhaps others. In the point of view stated here, astrology is an art whose practice instills science in the well-trained, well-practiced, and science-attentive practitioner.[2] To explain this view, the paper uses and comments on words to state a view of what science is, what art is, and how art and science relate to each other and to astrology.

Science

In the modern West, we generally assume that science is what Isaac Newton did when he promulgated his laws of motion. We see science in what Albert Einstein did when he set forth his theories of relativity. Robert Boyle, we say, practiced science when he measured properties of air, as did Charles Darwin to develop a theory of evolving life. We assume that we know science when we see it. We see science in the acknowledged and technology-conforming practices and theories of Newton, Einstein, Boyle and Darwin, and in those of countless other practitioners and theorists of modern technology, known and unknown.[3]

The word "science" traces its etymology through the Latin verb *scīre*. That verb is usually translated as "to know" and the noun *scientia*, which derives from *scīre*, ordinarily is rendered as "knowledge." Yet, upon further inquiry and reflection, one encounters a difficulty. The word "knowledge" does not trace its etymology through *scīre* or *scientia*, and those Latin words derive from a different Indo-European root[4] than that from which "knowledge" derives. The modern English word "knowledge" traces its etymology through *gnosis* (which itself is Greek but has a Latin form), a word whose Indo-European root is *gn* (or *gnō*).[5]

The very different Indo-European roots of "science" and "knowledge" suggest that the word "science" means something distinctly different from the word "knowledge." The difference between the words "science" and "knowledge" suggests, in turn, that science and knowledge differ. If *scientia* is not knowledge, then *scientia* and "science," and their shared Indo-European root, may be supposed to have other meanings to reveal and make available for human use than do "knowledge," *gnosis* and *gn*.

Consider the kind of confusions that use of the word "knowledge" to translate the word *scientia* creates. If both *gnosis* and *scientia* are translated as "knowledge," a speaker of modern English is lead to believe that *gnosis* and *scientia* are identical, and to treat them that way. Such a speaker, moreover, becomes heavily trained and determined to equate the words "science" and "knowledge," and, consequently, to understand neither.

The word "knowledge" already works overtime when assigned to translate *scientia*. Yet that single word—like the generic "snow" of people who live far from the polar circles—is piled with still greater responsibility. When the usual English translation of the Greek *episteme* as "knowledge" is added to the job, "knowledge" works triple-time. One could go further and add the Sanskrit *veda*, which also gets thrown into the modern English "knowledge" pot to stew a soup that swirls with numerous possible, ambiguous and confounded meanings. From this overuse alone, confusion arises. It becomes no wonder, therefore, that since the beginnings of the modern period in the 16th and 17th century

thinkers have so often and so much considered questions about what knowledge is and how human beings grasp it.[6]

The reconstructed Indo-European root of "science" and of *scientia* is *sek*, a root that means "cut, split; divide, part, drop off." From *sek* and roots that are its forms or extensions or that intertwine with it, come, for example, "cut," "incise," "decide," "precise," "chisel" and "sculpture." "Prescience," "conscious," "conscience," "omniscience," and "sift," "ascertain," "discern" and "skill," all have *sek* as a common Indo-European root.

In their Latin dictionary, Lewis and Short defined *scientia* as "a knowing or being skilled in anything, knowledge, science, skill, expertness."[7] Lewis and Short defined *scĭo* as "knowing, understanding, acquainted with, skilled, versed, or expert in any thing." The *Oxford English Dictionary*[8] defines "scient" as "having science, knowledge or skill."

Science is understanding of how the world and the things it comprises are divided or categorized. It is discernment of how the world can be divided to reveal itself, its parts and its construction. Science is comprehension of how things and world work in accord with regularities that rest on natural laws.

Discernment is closely related to science, and is one of its foundations. Discernment, like science, is founded in attentive and skillful sifting or division. We discern when we attend to and skillfully distinguish one part, category or kind of thing from another. The exercise of skill in cutting, sifting and discernment also results in continued development of the skill exercised.

We need to sift, cut, categorize and otherwise divide to know the world we inhabit. Yet, neither cutting and sifting nor dividing and categorizing are themselves knowledge, nor do they reveal all about a thing or world divided and categorized. Even discernment reveals less than full knowledge of a thing discerned.

Science is useful, and even necessary, to full knowledge of things and the world of things, and science and knowledge overlap and otherwise relate. *Scientia*, however, is poorly translated as "knowledge," and science and knowledge are not coextensive. One may speak of "scientific knowledge" (the term usually used to translate the Greek *episteme*) but, and despite dictionary definitions and usual contemporary usage, science and knowledge do not equate.

In the viewpoint represented here, modern and contemporary use of the word "science" misleads in fundamental ways. This misuse of language encourages and produces—even requires—significant shrouding and distortion of reality. On one hand, we equate science and technology, purporting to reduce science until it becomes so much less inclusive than it is traditionally known to be that it becomes something else altogether. On the other hand, we equate knowledge and science, purporting to reduce knowledge to the more limited purview proper to science. To reduce knowledge to science, while simultaneously reducing science to technology, would reduce knowledge to technology.

The work of Thomas Kuhn[9] focused attention on what Kuhn termed "paradigms." Since the time of Kuhn's work, others have identified and considered what has come to be called "the modern paradigm," a concept that bears a close relationship to the idea of "the disenchantment of the world."[10] The technological foundation of the modern paradigm becomes apparent when one sees the paradigm routinely, and usually unquestioningly, applied to all statements that purport to speak of the real world. Those who operate within the modern paradigm would subject all statements that claim to speak of the real world to the methods and rules by which modern technology is practiced and confirmed. In the view taken here, science is far more fundamental and inclusive than modern technology. As a result, the world that science models is much fuller, and therefore much more fully real, than the world modeled by application of the theories and method of modern technology.

The decision what to include in the category of science and what to exclude is one that implicates important theoretical questions. We, nevertheless, often make the decision to include or exclude in an automatic or reflexive manner. The reflex is born of the modern paradigm, and the modern paradigm holds the reflex in place. From within the modern paradigm, one categorizes as science only that which is recognized as founded in the interests, practices and theories of modern technology.

Until the work of Betty Jo Teeter Dobbs and others,[11] historians as a group largely ignored, and largely—though temporarily—buried, significant aspects of the work of those who studied the natural world in the 16th and 17th centuries. Failure to appreciate the import of Isaac Newton's lifelong engagement with alchemy—and, particularly, failure to recognize the integral part, perhaps even central role, alchemy played in the development of Newton's thought—provides an outstanding example. Starting in about the 1970s, historians of science began to take a fuller, less dogmatic view of the work of Newton and others. From the view taken in this paper, this development represents a refocus from an appreciably fabricated history of modern technology to a broader and truer history of modern science.

This more recent view of the history of science in the modern West emerges from a time when the history of modern technology was conceived in a manner that would put technology in science's place, and thereby would eliminate from science all but technology, and so would eliminate science as a whole. As a result of that view, we live in a most unscientific age. But that view, and its elision of much of science, is no longer sustainable. It is no longer possible to reasonably sustain a view that would set the narrow interests, approaches, values and views of modern technology retrospectively, anachronistically and otherwise falsely in science's proper place. The more recent view taken in the ongoing work of historians of science contributes significantly to inquiries that call into question the modern technology-based paradigm.

Art and Science

Art can be defined as "skill in doing anything as the result of knowledge and practice." The word, particularly in its plural form, can be explained as:

> Certain branches of learning which are of the nature of intellectual instruments or apparatus for more advanced studies, or for the work of life[. T]heir main principles having been already investigated and established, they are in the position of subjects requiring only to be acquired and practiced.[12]

Art rests upon practice. Art, from the Indo-European root *ar*, "reckon, arrange, fit, join," or "to fit together," is founded in practical know-how, in developed capacity, and in entrained, practiced ability to arrange things and fit them together. Science takes things apart in body, image or thought. Accordingly, science derives its name from a root that means "cut." Art fits things together; its name derives from a root that means "join." Art and science go hand in hand. Both require skill, and discernment of the structured or organic order of the things to which they attend.

In a consideration of *scientia* as understood in the Middle Ages and in the modern period, the academic scholar, James S. Ackerman, explained:

> In the Middle Ages, an "art" was a technique, and the seven liberal "arts" that constituted the core of education were not so much areas of knowledge as tools for getting and dispensing knowledge: the Quadrivium (arithmetic, music—because it taught proportion and harmony—geometry, astronomy) for penetrating into the structure of things, and the Trivium (grammar, rhetoric, logic) for representing the structure in words.[13]

Ackerman noted that *scientia*—science—"is inaccessible except through mastery of technique." As Ackerman explained, in order to acquire science as understood in medieval Europe, "one must be grounded in the 'arts,' or at least one of them."[14] Ackerman noted that "techniques gain an exaggerated position in a culture insufficiently controlled by *scientia*,"[15] and noted a modern "confusion of the scientific attitude with mere technique."[16] He said that the modern *scientia* "has exalted the technician and thus actually has blurred the distinction between technique and *scientia*."[17]

An art is a subject "requiring only to be acquired and practiced." Traditional arts and their practice are a means by which a cohesive group of human beings organize a community's productive, social, and sacred activities. Generally speaking, traditional arts change little and slowly. When not subject to destruction by outside forces, traditional arts remain notably stable over time. Their practice changes by accretion, adjustment, and occasional breakthrough. Accordingly, the science that practice of traditional arts instills is likewise stable and likewise creative. In individual practitioners, skill grows incrementally, and sometimes by a leap or a bound, as science accrues accordingly, and proportionately with the increase of skill in practice.

Phillipus Aurelius Theophrastus Bombastus von Hohenheim (1493-1541), known by the name Paracelsus, emphasized the great and fundamental importance of practice. Paracelsus' focus was the art of medicine, an art he practiced with enormous energy and devotion. Paracelsus had no use for academic treatments of medicine divorced from practice, or for medical scholars who confine themselves to book learning and to theories

ungrounded in practice. He publicly and notoriously burned a copy of Avicenna's classical work on medicine; some say he threw Galen's work into the same bonfire.

Apart from his formal education as a physician, Paracelsus learned throughout his life, from experience and from those with experience. He learned from barber-surgeons, bath attendants, apothecaries, herbalists (including women, though he had notable misogynist leanings), alchemists, magicians, the Romany people, monks, peasants, and anyone else who knew what he needed to know. "Learn and learn, ask and ask, do not be ashamed," he said, and said (again in translation):

> [W]e have personal teachers in nature. . . . They are born through seeing and touching, and not through nonseeing. For seeing and touching beget truth.[18]

Paracelsus intended to place theory in its proper place in relationship to practice. He did not intend to dismiss or denigrate theory that is founded in practice. He insisted instead that theory must always rely upon practice.

> Theory and practice should together form one, and should remain undivided. For every theory is also a kind of speculative practice and is no more and no less true than active practice. But what would you do if your speculation did not jibe with findings based on practice? Both must be true or both must be untrue. Look at the carpenter: first he builds his house in his head. But whence does he take this structure? From his active practice. And if he did not have this, he could not erect his structure in his mind: thus, both theory and practice rest upon experience. Practice should not be based on speculative theory; theory should be derived from practice.[19]

"Art" does not polarize with "science" in the way it is often polarized in modern terms. We attempt to polarize art and science, for example, when we seek to determine whether astrology is an art or whether, on the other hand, it is a science. In the viewpoint taken here, horoscopic astrology is an art whose well-trained, skilled and attentive practice instills science. Horoscopic astrology is a method by which we divide and discern reality when we study the *logos* of the living world through the stars.[20] It is an art by which we put together, in an image-derived, image-making, and animating synthesis, that which we first parsed and considered. Astrology depends on and generates science instilled in practice in accord with proper method understood in the light of sound theory.

Modern technology's method applies to modern technology. The method and rules of practice of one art, however, neither establish the method nor define the rules of practice of other arts. Nor do the method and rules of one art properly set and limit generally applicable conditions under which science is attained. Modern technology and its method set no proper standard for a general method that would regulate practice of all the arts that instill science. The method and rules of modern technology are even less fit to define the scope, limits and nature of human understanding or of knowledge itself.

A maker of clay pots, even a fine master potter, would have no business prescribing method to a practitioner of T'ai-chi Ch'uan. Conversely, it would overstep the limits proper to the art of T'ai-chi Ch'uan if its practitioners sought to dictate method to a potter or, even more radically and universally, sought to set up the view of science instilled in the practice of the art of T'ai-chi as the only true scientific view. Similarly, one who splits atoms or searches computed results for statistical significance is in no position to impose on practitioners of other arts a view that is founded in the practice of atom-splitting or statistics. Much less is a technologist or statistician in a position to define its method as the only scientific method and its view as the sole science of the real world. Thus, no atom-splitter, statistician or other technologist as such is in a position to dictate method to one who divines from the stars. When a differing practice stands firm on its own sound method, no technologist is in a position to rightly define as "pseudo-science" a science instilled in practice whose method differs from technology's method. A practitioner of one art, however, might learn something of science from practitioners of other arts, and each might pick up tips or perspective on method or technique by watching with a trained, practiced and attentive eye as the other demonstrates his art.

In a traditional view—and one in which astrology can be understood and to which, therefore, it can be admitted—"the scientific method," understood in a generic sense, is the trained and skilled practice of the arts, fashioned for each art as the art requires. An art, and, therefore, its method, may be organized into various systems. Each system is practiced according to the system's procedures, rules and particular techniques, set up and used in accord with method.

Science and Astrology

In the view taken here, astrology's proper practice demonstrates to a trained, practiced and attentive eye a fundamental science of cosmos and earthly life. In this view, astrology is an art whose practice reveals cosmos most fundamentally. As seen here, astrology is an art whose practice leads most directly to understanding of cosmic law, to attainment of the most fundamental science, and to an orientation that grounds knowledge of life.

In its practice in service of the art, astrology serves science and knowledge and their purposes. The purpose of science that the practice of astrology instills is to orient, inform and guide human beings engaged in life.[21] And astrology serves vision—as in the Sanskrit *veda*, whose Indo-European root, shared with the modern English "vision," and with "wise" and "guide," is *weid* or *ueid*, to "look at, see; object of vision." This vision is a context and a product—in a sense a by-product and yet a central point and purpose—of astrology's proper, devoted, and increasingly conscious practice by one intent upon science, knowledge and vision.

Astrologers know from practice that astrology is a fundamental means to measure cosmos and understand cosmic law and earthly life. Astrologers know from practice, for example, that the birth time and geographical place are highly determinative of the life that follows upon the birth. That knowledge is the fruit of conscious living woven with practice that gives rise to astrological science—where astrological science is understood as skill in

practice of the art of astrology, and skill in ascertainment and discernment that arise from practice.

Astrology has no need for confirmation with the use of modern technology's method. Rather, the practice of astrology generates science proper to the art of astrology. Astrology more than any other art puts to the test modern technology's overweening claims to sole authority to grasp truth, define reality, and delineate the manifest world. Here, in the proper practice and understanding of horoscopic astrology in a traditional form, lies a demonstrable and unanswerable challenge to the modern paradigm's hegemony. Here also apparently lies the motivating source of astrology's radical rejection and scurrilous treatment by modern technology's dogmatic practitioners and apologists.[22] The drive to defend claimed territory and its fruits is a powerful force that drives human societies, human history and human lives.

Modern technology steps outside its proper domain when it seeks to set itself up as the sole method to measure and test all that is. Modern technology oversteps its proper bounds when it purports to assay the truth of all assertions about what is real and existent. Practitioners and theorists of modern technology are the arbiters of the rules, requirements, nature and conditions neither of knowledge as a whole nor of science as a whole properly understood. Modern technologists, like those who practice any art, properly establish, monitor and maintain their method for use in the practice of their potentially beneficial art.

The belief that science, and even knowledge itself, is coterminous with what modern technologists do or discover is a foundation of the modern paradigm. The belief that technology, science and knowledge are fundamentally the same lends substantial force to the grip that keeps the modern paradigm in place. That belief and that paradigm truncate and falsely ground science, distort reality, give the lie to truth, weaken understanding, and undermine knowledge. Consequently, they undermine life. A mind freed of that grip, and grounded in the practice of the art of astrology, accrues science, comes alive to knowledge, encompasses an increasing share of reality, strengthens understanding, and encounters again and again truth's confirmation.

Conclusion

Traditionally, horoscopic astrology is understood to speak of the real world. In tradition, astrology models and reveals the world's dynamic and organic structure and its intelligent and communicative life. In the viewpoint represented here, the world that horoscopic astrology models and explicates is every bit as real as the world, or aspect of the world, that modern technology's theories model and that its practice reveals.

In contrast to the highly partial world that modern technology reveals and represents, the real world of which astrology speaks is a whole, intelligent and living world. As astrology's method and embedding cosmology model human wholeness, so astrology's practice reveals a whole, significant, communicative, dynamic, purposeful, intelligent, divine and animate world. That world embodies, and its model represents, human wholeness in itself, in its permutations, and in its dynamic, consequential and formative

life. The *Adam Kadmon* or *Kāla Purusha*—the Primeval Human or Being of Time—is the geocentric cosmos personified, divinized, and embodied in the stars. With that divine personification, traditional geocentric cosmology represents human wholeness and its macrocosmic analogue as divine embodiment, written in and as cosmic manifestation.

Science sets out the sifted, categorized, and skillfully discerned realities of the manifest world. As the world that modern technology represents is a world known by means of the science that technology's practice instills, so the world that horoscopic astrology represents is a world known in significant part by means of the science that astrology's practice instills.

In the practice of horoscopic astrology, we cut, parse, categorize and image the wholeness of the real world as astrology models it. When we skillfully guide practice with astrology's cosmological model, its embedding philosophy of nature, its theory of astrological signification, and the rules of its method, and when we are also attentive to our conscious relationship to self, others and life, we find that the practice reveals the real world. We find also that practice, embedded in theory and undertaken in accord with method, confirms the revelation. That's art, an art whose practice works with the materials of cosmic wholeness and human life. That's science, a science of the real world of divine, embodied, intelligent, communicative and consequential life.

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[1] The paper focuses on horoscopic astrology. The text generally assumes, and therefore mostly omits, the qualifier.

[2] The characterization of astrology in the text does not exclude other ways to characterize it. Thus, for example, astrology may be science-instilling art while it is also divination; it may be a mantic art and therapeutic resource, and also a bridge by which to approach the divine as it simultaneously reveals an archetypally categorized cosmos. Astrology is considered here principally in its aspect as a science-instilling art.

[3] As they have been defined in the West since the 17th century, the categories of science and non-science, and the means of placing practices in or out of the category of science, create difficulties and mislead. One form of the problem is seen in some difficulties "the soft sciences" have faced. Those disciplines have faced demands that they conform their method to the method and rules that govern the practice of modern technology. They have faced concurrent and related demands that their views conform to views founded on and confirmed with modern technology's method of practice. Modern psychology, for example, has spawned the behaviorism of B.F. Skinner and others. Those views and practices have little to do with human beings or with the experienced—and, therefore, behavior-motivating—realities of human life, except as they enable manipulation of human experience and behavior. Such theories, founded on modern technological method and applied to human beings, are swatches of "the veil of abstractions that we've come to insist is all that exists." Peter Kingsley, *In the Dark Places of Wisdom*, The Golden Sufi Center, Inverness, California, 1999, p. 216. Those theories also are expressions of the paradigmatic modern truncation of conceived reality. As such, they naturally follow upon the paradigm-determining, and now endemic, identification of science with modern technology.

[4] Comparative linguists identify Indo-European languages as a family of languages now or formerly spoken in widespread areas that range from Iceland and Ireland in the west to India in the east, and from Scandinavia in the north to Italy and Greece in the south. Through a process of reconstruction begun in the

early part of the 19th century and yet ongoing, linguists determined with notable success the shared linguistic roots of the Indo-European family of languages. Two useful dictionaries of Indo-European roots are Joseph T. Shipley, *The Origins of English Words: A Discursive Dictionary of Indo-European Roots*, John Hopkins University Press, Baltimore and London, 1985; and Calvert Watkins, *The American Heritage Dictionary of Indo-European Roots*, Houghton, Mifflin Company, Boston, 1985. All references here to Indo-European roots rely on one or both of these sources.

[5] *Gn* is the Indo-European root of both "knowledge" and "generation," and of numerous modern English words related to either or both. Some linguists, including Watkins, divide the Indo-European root into two—*gnō* and *genə*—identifying the first with "knowledge" and the second with "generation." Taken as a single root, the dual meaning of *gn* encodes the suggestion that knowledge is inseparable from generative, begetting or creative acts of living beings. The understanding that knowledge and its acquisition are inseparable from living a generative life is fully and analogically in accord with a central thesis of this paper: that science develops in the practice of the arts. As the practice of art is the generative source of science, so knowledge grows in living a generative or creative life.

[6] Many who came before the 16th century engaged questions about knowledge, a philosophical topic of significant interest in the West since at least the time of Plato's dialogues. Yet the changes that took place in the early modern period placed particularly great attention on questions about knowledge and about what and how people know. It may even be said that "Western Europe underwent something of an epistemological crisis in the sixteenth and seventeenth centuries." B.J.T. Dobbs, *The Janus Faces of Genius*, p. 11.

[7] Charlton T. Lewis and Charles Short, *A Latin Dictionary*, retrieved May 5, 2011 from the World Wide Web: http://www.perseus.tufts.edu/hopper/text?doc=Perseus:text:1999.04.0059

[8] *Oxford English Dictionary* (*OED*), Version 3.1, 2nd edition on CD-ROM. Oxford: Oxford University Press. Unless otherwise noted, definitions of English words are drawn from the *OED* in excerpts that omit ellipses.

[9] Thomas S. Kuhn, *The Structure of Scientific Revolutions*, The University of Chicago Press, Chicago, Illinois, 1962.

[10] See, for example, Richard Tarnas, *Cosmos and Psyche: Intimations of a New World Order*, Viking, New York, NY, 2006, pp. 11-15 (paradigms of history), pp. 76-77 ("Cartesian-Newtonian" paradigm); Roy Willis and Patrick Curry, *Astrology, Science and Culture: Pulling Down the Moon*, Berg, Oxford, UK, New York, NY, 2004, pp. 77ff (disenchantment and re-enchantment).

[11] See, for example, Betty Jo Teeter Dobbs, *The Janus Faces of Genius: The Role of Alchemy in Newton's Thought*, Cambridge University Press, Cambridge, UK, 1991; B.J.T. Dobbs, *The Foundations of Newton's Alchemy, or "The Hunting of the Greene Lyon*," Cambridge University Press, Cambridge, UK, 1975; Margaret J. Osler, Ed., *Rethinking the Scientific Revolution*, Cambridge University Press, Cambridge, UK, 2000; David C. Lindberg and Robert S. Westman, Eds., *Reappraisals of the Scientific Revolution*, Cambridge University Press, Cambridge, UK, 1990.

[12] *OED* entry under "art."

[13] James S. Ackerman, "On Scientia," in Gerald Holton, Ed., *Science and Culture: A Study of Cohesive and Disjunctive Forces*, Houghton Mifflin: Boston, 1965, pp. 14-23.

[14] Ackerman, "On Scientia," p. 20.

[15] Ackerman, "On Scientia," p. 15.

[16] Ackerman, "On Scientia," p. 20.

[17] Ackerman, "On Scientia," p. 22.

[18] Jacobi, Ed., *Paracelsus: Selected Writings*, p. 50.

[19] Paracelsus, in Jolande Jacobi, Ed., Norbert Guterman, Trans., *Paracelsus: Selected Writings*, Princeton/Bolingen, Princeton, NJ, pp. 51-52 (paragraph break omitted).

[20] The word "star" may be used to refer to any luminous celestial body. See *OED* entry under "star." In view of its Indo-European root *stā* (in Watkins' notation, or *sta* in Shipley's)—the root of "stand" and so defined—the word "star" does not apply to comets. It applies less apparently, and perhaps less well, to planets than to fixed stars. It does apply to planets, however, in the sense that planets' regular and predictable motions stand invariably in their established pattern. Here "star" is used to refer to both fixed stars and wandering stars (planets).

[21] Astrology, not the astrologer, is the guide. The astrologer is a devoted vehicle on which the astrological guide enters human life. An astrologer, like Lord Ganesha's good vehicular mouse, pokes here and there

for the crumbs and feasts of truth and reality the terrain bestows on the assiduous and increasingly skilled and conscious mouse.

[22] Not all modern technologists are dogmatic nor do all seek to establish modern technology's method as the only means to scientific or other knowledge. Nor, of course, can any be personally blamed for the endemic misuse of language in talk about modern technology, science and knowledge—nor for the blinders their discipline may set on the face, with alienation the cost of their private removal and expulsion that of going unblindered in public..