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Aristotelian Train of Thought in BioCosmology

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Abstract

Konstantin Khroutski envisions a new medical era or episteme in which health care will be devoted to the realization of each patient's whole-person needs, from biological to social, ultimately leading to their actualization as a human being. Commentator Anna Makolkin has pointed out that the transformation in medical culture is best addressed through an examination of the Greek concept of *nous* – mind and intellect. Aristotle's train of thought in his *Physics*, *Metaphysics*, and *Generation of Animals*, especially his analysis of the active and passive intellect, sheds light on the shifting modes of medical reasoning. Philosopher-physician Maimonides' medical writings also serve as exemplars of the flow of medical thought between organismic (humoral) and scientific traditions, leading to Khroutski's greater synthesis. The issue of a "Basic Cosmist Functionality" at the core of each person's state of health is addressed, drawing on three models – eventual, incremental, and teleologic. Aristotle's notions of cause and teleology suggest that a full model of health functionality will take into account momentary physiologic processes and include a teleologic element based on the individual's genotype and biotype. The paper concludes with an attempt to explain the notion of "cosmist functionality" held by Khroutski in terms of the omnipresent operation of the genome as well as the convergent nature of time for highly organized physical systems. The type of *nous* displayed by convergent natural processes is different, in terms of the incorporation of reflective consciousness, from human thought.

Key terms used: medical history, Greek philosophy, Aristotle, Maimonides, health, function, causality, teleology, gene

The Senses of Thought in BioCosmology

In *BioCosmology – Science of the Universal Future*, Konstantin S. Khroutski shows himself to be just as much philosopher as physician. There is discussion of *a posteriori* observed (vs. *a priori* gleaned) laws of cosmic order, the various epistemologic phases of knowledge acquisition, and considerable attention to process philosophy as it pertains to the universe and the health of the human being (Khroutski 2006a). The focus on knowledge is understandable given the rich philosophical history exploring *nous*, the Greek term for mind and intellect, and its foundational position in Western philosophy.

In her commentary on Dr. Khroutski's paper, Anna Makolkin of the University of Toronto rightly points out that *nous* has captured the attention of many a philosopher, from Anaxagoras to contemporary European philosophers, German, French, and Russian (Makolkin 2008, 2-3). She cites Aristotle as a mediator of the bent on reason from ancient Greek times to the present. One can see an example of Aristotle's applicability to Khroutski's philosophy of health in the following passage from Aristotle's *Metaphysics* Book VII (Barnes 1984, 1630):

The healthy subject, then, is produced as the result of the following train of thought: since this is health, if the subject is to be healthy this must first be present, e.g., a uniform state of body, and if this is to be present, there must be heat; and the physician goes on thinking thus until he brings the matter to a final step which he himself can take.

(Metaphysics VII 1032b5-9)

Aristotle describes the steps a physician goes through to secure his patient's "uniform state of body," a procedure resembling what Khroutski advocates for achieving a balanced condition with respect to the person's overall functional state of health. Thought here appears in two senses. First, the passage demonstrates Aristotle's broad agenda of moving from one subtopic to the next logical one, i.e., it uncovers his train of thought. Moreover, it reveals something of the process of human thought – establishing an initial working principle, making an inference, and forming a conclusion. How effectively can the notion of *nous*, suggested by Makolkin, serve Khroutski in his quest for a means of achieving health for the whole individual? In the pages to follow I will examine the concept of *nous*, and its potentials and limitations for a philosophy of health, following a train of thought found in Aristotle and his disciples.

Aristotle's View of the Intellect

Aristotle held a complex notion of thought. Like Anaxagoras, he believed that actuality precedes potentiality. Reflective thought and the actual object of thought operate in tandem, with the object having first influence. Though “thinking is the starting-point”, “thought is moved by the object of thought” (Aristotle *Metaphysics* XII 1072a29-30). Physical objects, objects that satisfy appetites, and sensations have the capacity to move human desire and thought in an undifferentiated way. The passive or “impassible” intellect responds directly to stimuli and forms perishable images (*On the Soul (De Anima)* III 429a30, 430b25; Barnes 1984, 682-4). However, the human intellect also has the capacity to speculate, and to envision “the good,” forming knowledge. The active intellect manipulates mental objects and has an essential mental nature, independent of physicality. The actual knowledge formed from bringing its content into consciousness, according to Aristotle, is “immortal and eternal” (*Ibid.*, 430a24).

Both levels of intellect, active and passive, are necessary in the life of the physician. The active intellect, though, begins to approach the type of *nous* Makolkin describes: “Reason and Thought at the point of the Ultimate Beginning of Human Existence, *vis-à-vis* NOUS – the Intellect of the Intelligent Cosmos” (Makolkin 2008, 2). States Aristotle, “thought ... becomes an object of thought in coming into contact with and thinking its objects. ... And it is active when it possesses this object. Therefore the latter ... is the divine element which thought seems to contain” (*Metaphysics* XII 1072b20-23). The divine element in human thought is a reflection of something more universal:

“throughout eternity is the thought which has itself for its object” (*Metaphysics* XII 1075a9-10);

“If there is no unity-itself or being-itself, there will scarcely be in any other case anything apart from what are called the individuals.” (*Metaphysics* III 1001a22);

“For whence is there to be another one besides the unity-itself? It must be not-one; but all things are either one or many” (*Metaphysics* III 1001b5)

In his *Metaphysics*, Aristotle used the notion of being-itself as a first principle from which further principles can derive. “Being” may be associated with several disciplinary tracks of a common nature (“homonymous”), forming the initial edifice of a branch of knowledge. When people associate being with “health,” it can serve as the hub of disparate ideas about health – preservation of health; creation of health; management of symptoms or attention to consequences of lack of health. “Health” as

a general concept serves as a relative starting point for practice, reflecting the much broader philosophical absolute or universal starting point – “being”. In the Aristotelian train of thought covered so far, a given concept can outline the starting point and goals of a particular field, such as medicine, as well as the inferential process to be used by the field’s practitioner.

The Age of Maimonides and Surrounding Medical Eras

At this point, we must admit that Aristotle’s ideas on establishing health are still somewhat general. Aristotle’s analysis has yielded general principles that could stand further articulation. One of Aristotle’s indirect disciples, Maimonides, offers the needed development. Also known as Rabbi Moses ben Maimon or “Rambam,” Maimonides was born in Cordoba, Spain in 1135, but due to Jewish persecution by the invading Almohades, accomplished his Jewish theological commentaries in Fez, Morocco, spending the second half of his life as a renowned physician and medical writer in Fostat, Egypt. Maimonides strove to reconcile Aristotelian philosophy and science with the teachings of the Torah (Davidson 2004).

In the face of religious claims to knowledge, Maimonides preached lack of human knowledge about the attributes of God (his “negative theology”; Maimonides 1995). In his system one cannot say the divine is a unity, but can argue, along with Aristotle, that the divine is not a multiplicity. Maimonides believed that the divine represents pure, universal Active Intellect, and that the human *nous poietikos* or active intellect is a gift mediated from the universal Active Intellect (a “rational emanation” of the divine). His philosophy clearly borrowed from Aristotle, but given that Maimonides wrote a number of theological works (e.g., *Mishneh Torah* codifying Jewish law; *Guide for the Perplexed* harmonizing and distinguishing Aristotelian philosophy and Jewish theology), it is unclear the division between reason-based philosophy and Judeo-Christian theology Makolkin paints is a logical necessity.

A wider disjunction occurred between the theological and medical portions of Maimonides’ life. Part of the gap was out of necessity. Maimonides did not feel compelled to learn the trade of medicine until the death of his father and brother, which occurred within the same year and faced Maimonides with the task of providing for his brother’s family. The incident drew a line between a life of philosophical and theological pursuit and a life admixing medicine and morality. Equally important, his medical studies were influenced by the teachings of Galen and the Islamic philosopher-physician Averroes, both of whom were Aristotelians (Dunn 1998, F227). Averroes argued for the emancipation of science and philosophy from Islamic Ash’ari theology. Maimonides accordingly took a rationalist position on medicine. He stressed the value of thinking logically and scientifically, lest the physician leave medicine to chance, luck, and danger. A key strategy for the patient

was to employ the “eye of the intellect” in noting their current state so the patient could act on their own insights (Bloch 2001, 831-2). Maimonides had a place in his system for divine influence in the restoration of health, but it assumed the character of moral advocacy rather than absorbing metaphysical principles or exhortations to prayer. This aspect of Maimonides’ thought, medically objectifying the human condition (Subject-Object orientation; Khroutski 2007, 13), represents the early tip of Khroutski’s Second episteme.

From Aristotle’s treatment of the Golden Mean, Maimonides derived his own principle of moderation, that a person should remain disciplined and avoid extremes of emotion in good times and bad. This tenet was impacted by the doctrine of bodily humours, elaborated on by Aristotle and Galen, so that imbalance in the bodily compartments merited particular forms of harmonizing management. For Maimonides, proper care applied to all the biopsychosocial dimensions, including avoiding excessive amounts of food and drink; avoidance of harsh measures such as blood-letting and strong purgatives; balancing of hot and cold in the environment; maintenance of a cheerful ambiance with other people; and resistance to extremes of personal emotion (Bloch 2001). The bedrock notion of four bodily humours relates most closely to Khroutski’s First episteme, which centers on people’s harmonious relation to nature and the cosmos, involving a relationship between one’s whole mind and body, and other human beings and the natural forces (Greaves 2004, 139). In Khroutski’s words, it is Subject-Subject and Subject-Absolute oriented (Khroutski 2007, 11-12, 16).

Perhaps because of the time period in which Maimonides lived, situated between the apex of Islamic philosophy and the rise of the Scientific Era in Western Europe, his way of thinking represents a transition state between the first two epistemic eras Khroutski outlines. Yet, Khroutski asserts that the Third emerging episteme represents a synthesis of the first two eras, combining science and philosophy to yield health care tailored to the individual in line with the health trajectories of others in the person’s wider community (Ibid., 15-17). Maimonides’ writings, therefore, foreshadow the Third episteme which Konstantin Khroutski says we are now entering. The rational scientific arm of the emerging medicine looks for pathology – the various Aristotelian etiologic causes Anna Makolkin (2008, 6) mentions – along with susceptibility factors the identification of which enable disease prevention. As Khroutski mentions, this approach involves identification of biotype (he uses the example of blood types) and genotype (in a previous writing, Khroutski mentions individual drug response and susceptibility to adverse reactions – pharmacogenomics) (Khroutski 2007, 14, 17; 2006b, 143). The humoral, organismic, or complementary arm of the emerging medicine concentrates on balance – balancing acidity and alkalinity; balancing energy; stress reduction; and elimination of toxins.

Despite fissures between the two types of practices, scientific and holistic medicine are both part of the current restorative armamentarium.

Models of Health Functionality

So far, so good with respect to the use of *nous* to explain medicine. Different types of knowledge have led to different historic intellectual periods with their distinctive orientations to self and world. The intellectual climate of a given period shapes the medical hypotheses and varieties of medical practice within it. Recognition of the difference between passive and active intellect, and harnessing the latter to derive principles of practice, lend the physician diagnostic and therapeutic rules that can be used in general or on a case-by-case basis. Beyond these points, what is distinctive about Konstantin Khroutski's BioCosmology is that it asserts the existence of a Basic Cosmist Functionality (BCF): "Every subject of life on Earth has its/her/his basic (ultimate, cosmist) functionality ... the one meaning and the main value of the self-realization by a subject" (Khroutski 2007, 14). This assertion requires more than a check to see where *nous* fits in human historical development and daily inference. It is a metaphysical statement, inviting investigation of whether the BCF exists, and in what sense it is powered by *nous* as an agent for change in the universe. The metaphysical exploration moves beyond the realm of Galen and Maimonides. Though both figures explored and wrote about human anatomy, neither was a biologist – they did not consider the "causes" of the structures they investigated. For exploration of the causal bases of human and biologic functionality, one must return to Aristotle, considered by many to be the first natural historian.

Perhaps the BCF could be viewed anatomically or behaviorally. However, one could dissect away, and never find a BCF. Likewise, a Skinnerian assembly of stimuli could prompt various self-preserving behaviors, but never demonstrate purpose in life. Khroutski argues one must get into the Subject-Subject mode of being (2007, 26), and feel what it is really like to be a subject. From the first person point of view, it feels like one has personal inclinations that shape what gives meaning to daily life. Drifting too far from these preferences makes the individual feel off track and brings down health. It is, therefore, worth it to posit the existence of a BCF and to speculate how it might operate.

It is possible that *Nous* brings about personal / biological functionality, but such an assertion begs the question of how it does so. Khroutski asserts that the person has responsibility for his / her own self-realization in life, sending and maneuvering their own self down a health trajectory, but early in life enough consciousness is not present to map out and plan such a path. Khroutski (2007) and Modell (2006) have dialogued on the possibility that the BCF might equate with the Aristotelian concept of a *causa finalis* or final cause, the "end or that for the sake of

which a thing / operation is done” (Aristotle Physics II 194b33; Barnes 1984, 332). Khroutski accepts this equivalence in the sense that a person has a “self-dependent task (aim, goal)” to realizing one’s healthy development, which takes a lifetime (Khroutski 2007, 11). He adds two qualifications. First, in his system of BioCosmology, final cause applies to the individual entity which serves as his/her/its own microcosmos. The focus is away from the Aristotelian “first principle” or “primary substance”. Second, in speaking of the individual’s “ontogenetic” or categorical development through life, Khroutski appreciates, like Aristotle, that all four types of causes – material, formal, efficient, and final – are operative (Khroutski 2007, 23). (Makolkin (2008, 6) is quite right when she points out to the reader that for Aristotle, these four token causes do not circumscribe the many particular types of causes that exist.) Perhaps it would be better to equate the BCF with a personal *telos*, an end or purpose, and to allow that it can be achieved via many causal pathways. So how might a person’s Basic Cosmist Functionality be achieved?

At least three models exist to allow for a person’s BCF to be realized: A. eventuality model; B. incremental model; C. teleologic model. All three models hurtle the individual towards their *telos*, but only in model C. does the *telos* exert an active force. In model A., the eventuality model, the individual of necessity reaches an end (nobody lives forever), the assumption being that the end they reach is their proper end. Two arguments counter this conclusion, however, both contained in a statement by Aristotle (Barnes 1984, 331-2):

For if a thing undergoes a continuous change toward some end, that last stage is actually that for the sake of which. (That is why the poet was carried away into making an absurd statement when he said ‘he has the end for the sake of which he was born.’ For not every stage that is last claims to be an end, but only that which is best.)

(Physics II 194a30-33)

The first counter argument, laden in this passage, is that the phase of life being considered may not be the genuine last phase. A chain of events may end abruptly before reaching final fruition. A life may be cut short either by externalities (e.g., a car accident) or internal maladies (e.g., a life shortened by cystic fibrosis or Huntington disease). The second counter is that the end arrived at may not be the “best,” or in modern terminology, the optimal state health-wise. A child may develop a retinoblastoma of the eye; an adult may develop pancreatic cancer in mid-life. In these instances, the eye and digestive system lose functional capability (in addition to the possible mortality they pose), hardly what Khroutski envisions as the person’s (and body part’s) Basic Cosmist Functionality. To be sure, in all of the above

examples, the person reaches an end, and a definite series of events led to that end, but it seems like there could have been another end equally if not more fitting.

Suppose, rather than a life course or biologic process moving blindly to its end, that guidance (regulation, monitoring) occurs along the way. This set-up is representative of the incremental model, wherein each successive stage in a chain of events has some level of nonrandom control for the direction it is taking. A handful of contemporary philosophers – Lieb, von Weizsäcker, Whitehead, Bergson – have adopted this model. For Whitehead, the stages are part of a process. Each subject is absorbed into a more comprehensive superject. The direction taken depends on the “graduated intensive relevance” of the choice being made to the overall sea of opportunities awaiting the subject (Whitehead 1960, 315). For the other three philosophers, the stages are part of a movement. For Lieb the movement through time entails moving headlong into a future, with the act of reorganization occurring in the immediate future and closure occurring in the immediate past (Lieb 1991, 60, 68-9). As stated in my first response to Khroutski (Modell 2006), Lieb’s view is that enough room exists in the immediate past and future for the laws of physics and of chaotic systems to operate so that the subject can move along a determinate rather than random path. For von Weizsäcker and Bergson, transformation from the potential to the actual takes place as a movement (von Weizsäcker 1980, 353-4). In fact, Bergson went so far as to claim “change ... is the very substance of things” (Bergson 1983, 156).

Several of these thinkers refer to Aristotle as a figurehead for their ideas. Typically, Aristotle frames his arguments both in theoretical and concrete terms. Thus, in his discussion of Zeno’s paradox (the theoretical example), Aristotle explains (Barnes 1984, 1536):

Again, a line and a plane will be joints; for they are analogous to the point.
Again a joint is in a sense on account of movement.

(On Indivisible Lines 972b28)

The heart (the concrete example), according to Aristotle, displays successive development (Barnes 1984, 1148-9):

When the embryo is once formed, it acts like the seeds of plants. For seeds also contain the first principle of growth in themselves, and when this has been differentiated, the shoot and the root are sent off from it. ... Therefore the heart is first differentiated in actuality. ... For that which exists grows, and the nutriment, in its final stage, of an animal is the blood or its analogue, and of this the blood-vessels are the receptacle. ... So nature has first designed the

two blood-vessels from the heart, and from these smaller vessels branch off to the uterus.

(Generation of Animals II 740a)

One can almost picture the development of the heart, issuing of blood vessels from it, and coursing of blood through the blood vessels, all in orderly progression. Finally, Aristotle applies the notion of successive change to the health theme (Barnes 1984, 1686):

Of things which change, some change in an accidental sense, like that in which the musical may be said to walk, and others are said, without qualification, to change, because something in them changes, i.e., the things that change in parts; the body becomes healthy, because the eye does.

(Metaphysics XI 1067b1-4)

It might be that the body becomes healthy because the eye does, but it could also be said that most health restoring events in the body occur because of the presence of organized processes – the activation of the immune system, growth over a wound, the oxygenation of blood and tissue.

To what extent is thought involved in tissue development, bodily regulation, and the restoration of health? People can certainly study these processes with the hope of coming to the body's aid. With sufficient knowledge we can intervene in the body's affairs. A person can know that something is happening in his or her own body. The processes themselves, however, occur unconsciously, or non-consciously. It is said that health restoring processes constitute the wisdom of the body, but this kind of wisdom is not meant to be of the cognitive sort. It is highly organized, and operates in orderly fashion, but for the most part bodily operation is not mental. Perhaps it could be referred to as nature's intelligence, or *Nous*. One could not easily disagree with this point, except to say that the natural *Nous* is not like the human level *nous*.

One could also apply the incremental model to the operation of one's own life, where life is meant in an existential rather than biological sense. This caliber of life would prompt a person to plan things as he or she goes. More attention would be devoted to the current and upcoming moment, rather than the far horizon. There would tend to be deviation alternating with correction as the individual makes up his or her mind which way to go. Perhaps, as Maimonides put it, the person would experience extremes on the way to achieving their goals.

The final model to be considered is the teleologic model. Though as we noted with the first model all processes have an end, in this instance the end exerts control.

The individual or process behaves as if it were directed towards a definite end or has assigned to it an ultimate purpose. The general Greek model is that of building a house. (Aristotle also uses painters and sculptors as examples.) Though all four of Aristotle's causes are operative in the coming together of the house, the fact that the construction is being governed by a blueprint to the very end makes the final cause of special significance. The literature we have been discussing has plenty of biologic examples. Take the T-lymphocyte or immune cell discussed by Khroutski. It proceeds through multiple stages, from formation in the bone marrow, to migration and maturation in the thymus, to delivery to the periphery, where it takes on its specific activity in the acquired immune system (Khroutski 2007, 31). It is continually progressing towards an inexorable end.

In *Metaphysics* Book IX, Aristotle mentions corn in the potential form as a seed, capable of growing into actual, fully ripened corn. (Russell (1945, 205) has somehow shifted the corn example into that of an acorn having the "nature" to grow into an oak, and has been quoted widely on this idealization of Aristotle.) He often refers analogously to plants and humans (Barnes 1984, 1629-30):

Of things that come to be some come to be by nature, some by art, some spontaneously. ... Now natural comings to be are the comings to be of those things which come to be by nature; and that out of which they come to be is what we call matter; and that by which they come to be is something which exists naturally; and the something which they come to be is a man or a plant or one of the things of this kind, which we say are substances if anything is.

(*Metaphysics* VII 1032a12-20)

The artist motif enters in when Aristotle describes human conception (*Ibid.*, 1149):

The female, then, provides matter, the male the principle of motion. And as the products of art are made by means of the tools of the artist, or to put it more truly by means of their movement, and this is the activity of the art, and the art is the form of what is made in something else, so is it with the power of the nutritive soul.

(*Generation of Animals* II 740b24-29)

Just as the philosopher, like the artist, has a goal in mind for his or her rendering and the means to express it, the nutritive soul has the power to form the final product – the full human being. The goal of the gestational process is the human being. Von Weizsäcker, in reviewing Aristotle's thought, refers to the sperm as "the presence of the future" (von Weizsäcker 1980, 354). If there is no interference with gestation, the full human being will come to be. However, "the future also presupposes the

presence of the past" (Ibid., 356). Likewise, Aristotle believes that the actual precedes the potential, which then reproduces the actual. The sperm is created by the perfected (already complete) human being.

By what process does the actual become potential, ultimately to recapitulate itself in a new variation? The actual human being clearly creates an emission, the sperm. Probing deeply into what Aristotle hypothesizes as the mechanism, the sperm either is or represents an initial activating or catalytic principle, not unlike the modern scientific version of the sperm penetrating and spectacularly uniting with the egg. But union is not enough – an active organizing process must then carry on. Aristotle does not settle with the simple explanation that a *telos*, the full human being to be, makes embryonic development happen. He states that the nutritive soul causes growth from nutriment, utilizing heat and cold and acting according to "a certain formula" (Generation of Animals II 740b32). On the one hand, this description is very close to the modern version of how an enzyme acts; on the other, it resembles the following of a physico-biological law, not unlike a biochemical pathway. It is easy to see how *nous* could be assumed to be operating, as biological and chemical pathways do seem to follow a planned blueprint. Aristotle's nutritive soul would likewise seem to be acting intelligently.

Today we realize that the diploid genome, formed by the combination of male and female genetic material, carries the process of embryogenesis through. Scientists have likened the genome to a blueprint and to a microscopic, folded-up encyclopedia, so the ascription of "intelligence" could hold, though the intelligence here operates automatically. Does transcription - translation of the genome operate teleologically towards an end-goal? States Mayr, "The purposive action of an individual, insofar as it is based on the properties of its genetic code, therefore is no more nor less purposive than the actions of a computer that has been programmed to respond appropriately to various inputs. It is ... a purely mechanistic purposiveness" (Mayr 2007, 55-6). Mayr views genes as operating via efficient cause. Yet, genes have a regulatory function, and are ubiquitously conducting themselves in the individual, from conception to the very end. The genes themselves never vary – they are fully present and complete in every cell at all times, thus are about as close to a *telos* as any physical or biological agent can be.

From the above depiction it is possible to get a sense of how Khroutski's BCF might operate. The BCF is genetically programmed into the individual from the shuffling of the maternal and paternal DNA. The genetic material acts as the fundamental ground of a person's BCF, though their "function" as a human being is a complex matter of the biopsychosocial flowering of the individual throughout the lifetime, based on the genetic substratum. Incremental processes are present. Health is the successful traversing of biological and existential life from moment to moment.

Also constantly present, though, are the guidance mechanisms within the individual – the DNA, brain, formed sense of identity, and arguably a spiritual sense. These guidance systems are unique to every individual. Further, the mechanisms of guidance are what prevent the person from going through wild swings of the kind Maimonides warned against. As the individual's life matures, more and more these non-moment-to-moment, more overreaching systems keep the person on the straight and narrow path.

A large question remaining is whether and how a BCF would induce an individual's fate to blend harmoniously with those of the other community members (Khroutski envisions "humankind" in the broadest sense) with whom they come into contact? Certainly the notion of interaction with the environment was part of the organismic view, and finds recrudescence in today's public health disciplines. This question approaches the notion of a universal *Nous* that Makolkin describes. Whitehead, too, felt that separate subjects are engaged in a convergence towards a unifying superject. The question really forces the thinker outside the traditional realm of biology and philosophy of biology. It is possible that *Nous* carries a design for the universe, thus for individual human beings, but this line of reasoning begs a lot of questions. One might also speculate that Whitehead's "concrecence" is built into the universe, perhaps as an overarching physical law, but this proposal seems like an intermediate explanation in search of a finer grained or more fundamental reason.

Beyond Design to a New Vision of *Nous* in Health

It is helpful to take a page from Einstein, who moved beyond the notion of gravity as a physical force to the idea that gravity is a natural correlate of the shape of space and time (Einstein 1961, 102). Just as movement from moment to moment is part of the linear flow of time, the "centripetal" convergence of events within and between individuals that Whitehead and Khroutski mention is most logically part of the dimensional structuring of time itself (Modell 1994). Time flows forward, cycles, and converges. The convergence process seems highly organized because it does not act blindly on simple kinetic systems, but on systems that have reached the point where singular events have become entrained, thus can come together naturally with coherence, like the inner operations of a biologic organism, or the jibing parts of a human life. When the synthesizing dimension of time is tapped into, chaotic systems (and lives) mesh, and health results for the various members.

By the process of synthesis or concrecence, the universe takes on the guise of being intelligently designed, and the Basic Cosmist Function seems to be issuing intelligent commands. Regulatory function occurs at a high level of organization, and when it occurs, it creates and maintains intelligently patterned phenomena. This

argument does not eschew the possibility of intelligent reflection on one's purpose or on universal meaning, either by human being or Deity. The matter of a reflective consciousness behind *telos* requires further constituent elements in whatever ontology is being explored. There can be no doubt that human beings are in possession of quite active minds, but whether the BCF must consciously surface or be continuously held in the mind to operate, is less obvious.

The daily operation of health care and the gradual advancement of medicine and public health are the result of thoughtful, caring minds and able bodies. The institutions that cater to health and human welfare, and the educational institutions driving human intellectual flourishing are all the product of the active intelligence. A great lineage of philosopher-physicians, among its members Aristotle and Konstantin Khroutski, point out that the wise application of active intelligence to human life results in a healthy life.

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