PROBLEMS OF INTROSPECTIVE ENTITIES

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ABSTRACT. Conceptual biology of epistemology can concern empiricism and realism. Scientific realism is considered basic to biophilosophy. Programmed informational macromolecules are responsible for ontogenic aspects of evolutionary processes. Pre-ontogenic information systems are discussed in the light of developmental structure during ontogeny. The idea of biofuzzy mathematical subsets is presented as a descriptive tool in discussing problems of individuality. The concept of biogradients, as involving philosophical arguments, is examined using a variety of situations from "embryonic mind gradients" to evolution itself. The mind/body problem is discussed in terms of "biogestalt theory". An evolved introspective mind can and will eventually interpret an evolving system that allowed it to exist. Introspective minds are considered to be a biological gradient with respect to evolutionary aspects of the brain. "Thought experiments" are done with dual brain gradients and mosaic (e.g. cat/human) brains for exploring the concept of the individual. Individual human minds can conceivably be produced from different genotypes, gynadromorphs, hemi-individuals, cloned tumor nuclei, and ultimately those connected to computer systems as bionic minds, individually or in series. Multiple individuals (minds) can be formed from potential single individuals. Finally, syncytial vs. individual type biospheres are considered.

KEY WORDS. Biofuzzy subsets, biogradients, biogestalt theory, thought experiments, bionic minds, multiple minds, syncytial biospheres, mosaic minds, embryonic mind gradients, engram patterns.

1. BIOPHILOSOPHICAL INTERPRETATIONS OF EPISTEMOLOGY

Conceptual biology can be reduced to two aspects. Firstly, from atomic, molecular and super-molecular properties of such complex matter as sugars, lipoprotein bi-layers, enzyme biocatalysts, nucleotide polymers, etc., one can interpret multi-aggregates of sub-organelles in arrays and patterns that are thermodynamic auto-replicate systems as biological cells. Unique features appear to be present in these systems which may be non-mechanistic and interpretable as vitalism.

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Secondly, such self-propagating systems are selected for within specific micro-environments. Thus natural selection works through synapsis of informational macro-molecules with crossing-over (mixing) of alleles that present populations with polymorphisms, resulting in organic evolution.

Conceptual philosophy, epistemology, is concerned with empiricism and realism. Epistemology is a philosophical theory of knowledge that deals with its nature, varieties, origins, objectives and limits, where knowledge itself is justified true belief. However, justification may not be possible. The best that can be achieved may be critically examined non-falsified conjectures. This can be approached by removal of errors. Thus truth may never be attained, but truth can be considered to be approachable by this means.

Such knowledge may derive from a series of theories, of explanations and of definitions. Concepts of knowledge are derived from or explicated in terms of sense-experience or introspection. This is a characteristic of positivism. Empiricists have tended to conceive knowledge as accumulating by induction from a base of logically independent facts.

Realism sustains the thesis that the objects of knowledge exist and act independently of our knowledge of them. Platonic or Aristotelian realism deals with the existence of abstract or universal entities or properties of particular material things. Perceptual realism states that material objects exist in space and time independently of perception. Scientific realism is the idea that objects exist and act independently of the observer's observations of them.

Most biological aspects of epistemological ideas are based upon biological norms—especially those of the mind. It is my contention that all considerations—normal, abnormal and what I will term "biogradients"—should be dealt with to present a more generalized interpretation of epistemological philosophy. Thus one may derive, through the use of basic concepts, a biophilosophy that embraces the above notions.

Space and energy is fundamental to conceptual natural philosophy. Thus one can begin with the fact that string theory can be used to describe particles. Instead of particles occupying a single point of space they are considered to be infinitely thin with finite length. Even gravitational force can be described by string theory which requires ten or as many as twenty-six dimensions. A grand unified theory that combines strong and weak nuclear forces can be described mathematically by a supersymmetry system that has gluons of the electroweak forces including photons. Quantum chromodynamics has been developed based upon the discovery of quarks. All of the interactions between particles depend upon four fundamental forces: i) gravitation, ii) electromagnetic, iii) strong nuclear, and vi) weak nuclear. These systems can be interpreted, for the most part, in terms of relativistic electromagnetic fields termed quantum electrody-

namics. If relativistic space-time is considered to also have properties of energy fields, then one can unify all of these into "energy-space-time" —there it can be considered a single entity. Where energy is virtually absent, it would be described as a vacuum and where it is dense it would be matter. A nucleic acid molecule would be a pertinent kind of matter in biological matters.

Since programmed informational macromolecules, such as nucleic acids, are responsible ontogenic entities, it seems reasonable that any evolution of such a system would operationally use any information that may be successful for that particular ecological niche that may be exploitable. For example, consider a primitive, arm-feeding, sessile pre-chordate that shifts to a filter-feeding hemi-chordate acorn worm. Since the larval stage of arm-feeding of echinoderms can have a very similar morphology as the acorn worm larval form, it appears that the early ontogenic expression of the information is generalized enough to be able to be reinterpreted for use in the hemi-chordate ontogeny. The writer has discussed another aspect of certain pre-ontogenic information of yeast cells being used for embryogenesis of chordate systems and therefore probably for the total linage of embryonic type cells throughout phylogeny which has been maintained for this use [1].

One may extend this to other morphological entities such as gill slits of elasmobranchs (chondroichthes) which is, of course, in the adult form of the shark and is expressed in other vertebrate embryos, but used for further developmental structures during ontogeny. Thus embryonic type genes, i.e., those expressed during the embryonic period (and not housekeeping genes), are genes that are recapitulating phylogeny [2].

2. BIOFUZZY SUBSETS, PROBABILITY AND TRUTH

Biofuzzy subsets were first defined by Hancock and Ji [3]. Mathematically stated: if $\underline{B}$ of B is a bioset and b is a bioelement of B, Then a biofuzzy subset $\underline{B}$ of B is a bioset of ordered pairs: $\{[b/\mu_B(b)] \supset b \in B$, where $\mu_B(b)$ is the degree of membership of $b \in B$. Furthermore, $\underline{B} \subset B$ and $\underline{B} = (b_1 / \mu_B(b), ..., b_n / \mu_B(b_n))\}$. Conceptually one can think of the degree or probability of, for example, an element "a" being in a set B (from some intersection of sets A and B).

Biophilosophically, there appear to be many cases that can be described as biofuzzy subsets. For example, Putnam [4] in discussing the term "meaning", which may be transformed via changes in basic beliefs, could be reinterpreted in the following manner. If there were a set M for all possible meanings and m begin a particular meaning, then one has the set M = (m ,..., M). The basic belief J, that the meaning is attributed to, could be described as B_j. Thus the degree of membership of a meaning $m \in M$ would

vary as a biofuzzy subset: $\{[m_j/\mu_M(m_j)]\} \supset m_j \in M$ where $\mu_M(m_j)$ is the degree of membership of $m_j \in M$ due to the Jth belief.

Without further reducing examples into mathematical terms, one can see in discussions of "analytic vs. synthetic" by Putnam that involve trivial statements, this becomes a fuzzy term—how trivial and trivial under what circumstances and trivial to one person but not considered trivial by another.

Frankfurt's[5] discussion of higher order desires (although he disbelieves in them), creates a hierarchy of order of degrees: [desires]. This, in turn, would create a biofuzzy subset since the problem of selecting which level of "order of desire" that would operate under any given mental state would be fuzzy.

With the above comments in mind, it appears that truth in reality would be fuzzy or has a particular probability state and, furthermore, appears to be relativistic.

3. BIOPHILOSOPHICAL GRADIENTS

Examples of what I will term "biogradients" appear to be extensive in philosophical discourse. The concept of a biogradient is simply that things involving biological entities are typically not "black or white" and they are not even multi-faceted, but that they are represented by continuous smooth curve functions that gradually change. This idea seems to be omitted in most philosophical arguments. The following are a few examples of a reinterpretation of some of these philosophical discussions in terms of biogradients—thus "biophilosophical gradients."

The concept of an agent is a biogradient in that there are many biological forms with complex brains that could act as an agent in the philosophical sense. If all known (and unknown) pre-humans (hominids) were alive today (and there is no reason to disbelieve this as a possibility, since other ancient species live today, e.g., the horseshoe crab), then there would be a continuous "dawn-of-introspective-mind" gradient. In fact, this is, of course, why we (*Homo sapiens*) can introspect today. Thus we need to generalize and speak of 'comparative agent caused' in philosophical discussions.

The whole broad attitude of society surely induces gradients of philosophical interpretations, e.g., 'folk psychology'. Furthermore, all crimes and punishments must be considered under such things as conditions at that moment, i.e., social evolution an interpretations of ethics, etc.—thus a continuously changing gradient of how sever a specific crime is perceived and how sever the punishment would be.

Many aspects of mental function can potentially require reinterpretations of philosophical arguments. For example, what engram patterns of higher cerebral function emanate from anomalous minds such as schizo-

phrenics? Yet, the gradient from normal to more and more psychotic mental activity is indeed a biogradient that would have to be addressed in a philosophical discussion. It could even be conceived that some person with schizophrenia might have an interpretation on a specific philosophical problem that would be "better" than hitherto presented by normal minds.

The interpretation of bad behavior could be a biological gradient of how much of the behavior was caused by, say, a neoplastic growth of the brain and what areas are involved. At one end of the spectrum (biogradient) would be a murderer who has a small meningioma of a meningeal membrane of the brain, who could hardly use this as an excuse for his illegal behavior, whereas a murderer with massive involvement of a glioblastoma of the frontal lobes, could easily have induced abnormal behavior, such as an extreme episode of anger that, when acted out, resulted in violence.

Particular subsets of one's mind can be altered, such as cognitive skills that could be modified separately—emotional aspects, language, visual or recall. Thus Dennett's[6] discussion of the insane or brain damaged cases as having "no selves" is too simplistic.

One needs to define precisely what parts of the mind are nonfunctional or partially functioning, etc., which in itself is a biogradient of the extent of the alterations, before any philosophical overlay can be considered.

Dennett has spoken of "illusion of such an ultimate center arises the idea of the self as a unitary and cohering point of view of the world." The mind (self) is, however, as discussed above, a composite of various subsets. If you lose any part of the mind, then you lose part of the self—e.g., visual cortex (sensory), frontal lobe (judgment) or hippocampus (memory), etc. Thus, the concept of the self as a "unitary" thing by Dennett will not work. The mind and self are biogradients.

Furthermore, Dennett speaks of "our conscious," but one must also consider semi-conscious states—to be able to generalize in a rigorous fashion about philosophical notions. Therefore, we must include subconscious and even unconscious states (as a limit) and all the "in between" states which, thereby, creates a biogradient.

Dennett has mentioned animals and their ability to recognize themselves, giving the example of some apes and humans having this ability. But this immediately places the discussion into a biogradient of the whole order of primates.

Robot examples may be generalized by having robotic mosaics of human/machine components and thus the examples with varied thought problems can (and should) be more complicated than those used. In other words, the robot is an example of one end of a spectrum (gradient) and the human is the other end—both of which are simplistic "pure" examples

with which to deal. Whereas the multitude of "hybrids" in between would be a more complete set. The total set of all possible combinations would theoretically need to be addressed.

There exists another whole area of biogradients of the mind and that is what I will call "embryonic mind gradients." In other words, the mind during development can be said to begin possibly after the encephalon is formed and its first primitive simple engram pattern is created upon it. But who has ever addressed the problem of the "self" or the "agent" or any other philosophical problem with reference to embryonic minds and the developmental biogradient thereafter?

Darwinism is by definition a biogradient and thus any discussion of, say, morality should address subhuman ethics and so forth.

Last, but not least, the concept of the soul. Perry [7] has presented the multitude of possible arguments related to the idea of a soul. But once again, one must address the gradient of evolution of the mind as basic to the problem—at what moment did the soul appear during this bioevolutionary phase (i.e., if the soul exists). The other idea would be a gradient (biogradient?, theological gradient?); one where the soul corresponds with the gradient of the mind during organic evolution. (Aristotle, I believe, had already thought of this idea under similar terms, albeit non-Darwinian evolutionary terms.)

4. A DERIVATION OF MIND BY USING BIO-GESTALT THEORY

The problem of mind/body (or more correctly mind/structure) duality has not been resolved. One rather superficial argument is as follows. Liver structure has the function of producing bile for fat digestion. Analogously, brain structure has a function called "mind". Thus mind is simply the function of an organ—brain, no more, no less. It is the result of bioelectric activity of specialized nerve cells. However, after having said this, there still remains the question of how this organ has the remarkable ability to think. Attempts have been made to create a mind by using a model system, i.e., by trying to create artificial intelligence. The paradigm is to use not equal, but systems complicated enough to be labeled as approaching some simple mind state. Yet, this has only produced "mimicking" results. These computer model approaches, thus far, have failed to produce something that would be considered as having the attribute of "thinking". The term "thinking" could be defined here as follows. Firstly, it would be more than reflex type modeling such as that produced by the "turtles". Turtles were small robots that had negative tropisms for contact with each other and positive tropisms for "feeding" (at low battery charge they would seek the recharging terminal). Secondly, it would be more than "gaming" or chess playing where a set of rules (programs) would allow a game to be played.

Thinking is being used here in a very restrictive sense; in terms of creative innovation, emotional responses to language and judgment—thus higher features of the human mind.

One possibility of resolving this problem, philosophically, at least, is to use "bio-gestalt theory". I will define gestaltism as in the following example. If a round mirror is broken into two pieces, the sum of the two pieces does not equal the whole unless they are arranged in a particular pattern—the disc. Thus, the pattern was lost. The pattern is the gestaltic third thing derived from the two pieces. The concept of Gestalt, to be used here, is that "thirdnesses" or biogestaltic features of the neural net that would appear. Such a derived feature may occur as a gradient, i.e., as the neural net system becomes more and more complex, the ability of the system to think would become greater and greater. Or, possibly, some critical complexity (analogous to critical mass in atomic explosives) suddenly endows the system with this ability. These "neo-features" cannot be obtained by the simple addition of components, say, for instance, connecting neurons in a linear fashion, but these neurons must be in a complex pattern that allows engram physio-electric and neuro-chemical capabilities, that in turn would result in higher mental function, e.g., introspection.

"Thirdnesses" are derived from complexity (complexity of neural nets) thus allowing for higher mental function. Besides the reaction to sensory stimuli (avoidance of noxious environmental things, food gathering behavior, instinctive behavior) or motor activity, the organism can now interpret, introspect and create—the realm of the human mind.

It seems, in principle, with complete analysis of brain structure/function, that it should be possible to derive an equally complex and correctly patterned electron system that, in turn, would display such unique qualities of the human mind, inclusive of free will.

One type of thinking, that of aesthetics, could be conceived to be based upon a complex photocell that would function as an eye. Rudimentary systems of this type exist today in attempts to aid the blind. One begins by imposing a program that is devised to instill ideas of beauty. For example, if certain mathematical functions that represent certain "smooth" curves (that would, in an over all pattern, be considered in the set "beautiful"), would be used for analyzing input into the photocell component when it observes, for example, a rose or photograph thereof. Similarly, a "jagged" line (curve) would be programmed to be considered "ugly". Thus, a wilted rose would result in an ugly interpretation by the computer. However, there appears to be a basic flaw in this computer- based aesthetics. Since old "ugly" faces drawn by Da Vinci is usually considered beautiful art work, but our computer would consider it not aesthetically pleasing, it would need further programming to assess potential good qualities of artistic merit. The problem here becomes compounded by the fact that the

programmer's historical background would subjectively create whether the qualities of such a program, along with its criteria for beauty, is "correct" enough. But now one must transcend to have the robotic entity self-learn to evolve to a level of complexity to derive its own aesthetics. Such philosophical arguments could then be used by thinking programs to form dialogues and potential conclusions.

5. QUALITATIVE VS. QUANTITATIVE ASPECTS

Concepts of reality can be based on singularities expanding to pre-biotic "space-time-energy" patterns. Subsequent inorganic evolution occurs by atoms and particles leading to bio-organic systems controlled by selective pressures on allelic gene information depots and eventually to neural nets that allow engram patterns. Thus, the resulting introspective mind exists to interpret the system that allowed it, in turn, to exist. This is a qualitative aspect of the reality of mind. The quantitative aspect has been well presented via astrophysical description of galactic structure and the universe as a whole.

Given these qualitative and quantitative aspects of introspective systems that occur, one must wonder as to the significance of heterogeneous (communicative and non-communicative) biospheres. And taking this question to the limit, why, in the derivation of reality from $t=0$ to $t=x$ before introspective minds have evolved, to $t=y$ when introspective minds exist, should introspection have evolved at all, since at $t=x$ all reality and specifically a great deal of the biological world was intact and operational without such introspective ability? Thus the importance of the evolving of introspection into reality is not obvious, unless one says that the introspective mind is an ultimate goal of an originator of reality. This leads to the further question: why a "creator force" would design a system that realizes it exists?

Most potential introspective minds never exist due to the fact that most gametes never conceive any individual. The final subset of individuals that come into existence, exist, of course, for varying amounts of finite time. In conclusion, a particular individual mind is then, by these quantitative arguments, an extremely rare entity that lasts for only a fraction of a moment as compared with the age of the universe.

6. MULTI-INDIVIDUAL VS. SYNCITIAL FORMS

It is proposed that the concept of a biological individual is fraught with ambiguities. Examples of real or theoretical anomalous brain conditions present potential minds which, in turn, create problematic backgrounds as a basis for the entity termed "individual". The so-called individual may

be only one probability state, albeit an extremely high one, from a variety of possible states. The upper limit of these considerations would be a syncytium over a biosphere that, as a generalized case, also can be useful for other theoretical interpretations.

Individuality is taken for granted because statistically most entities are a separate collection of cells. However, bio-philosophically one can make arguments as in the following.

Recalling the event of so-called Siamese twins, i.e., two "individuals" usually born connected at the vertebral area. But in other cases they are joined at the front, or possess the same liver or heart. Other may be joined at the head.

Let us now proceed to make arguments regarding and explore the "head" cases. If there are two heads and one body, one would classify this as two individuals. Why, because the mind is the most satisfactory basis for individuality. If an arm is cut off, the individual still exists. If the heart is replaced by a mechanical device, the individual exists as well, etc. But if the brain were replaced the original individual is surely gone. In other words, the original "I" with its neuro-engram history is gone.

Returning to the Siamese situation, one can have a total series of joined heads at varying degrees, from two separate brains to totally fused brains, i.e., from two brains (one body) to one brain (but two bodies) and all possible combinations in between—in other words a biological gradient.

Now let us extend this anatomical situation to a dynamic model. Beginning with the two headed (two brains) example that would have two minds, let us say that one head/pair of eyes/brain is allowed to read only communistic political ideology and have the other head/pair of eyes/brain read capitalistic concepts. With this case we have no problem—a mind versed in communism and the other in capitalism. But as we have examples with more and more anatomical fusion of the two brains, where the communistic and capitalistic thoughts would be, especially in the totally fused brain, completely dispersed. So one concludes there is only one mind with information stored from input through one set of eyes (communism) and the other set of eyes (capitalism). The question then becomes: does the entity termed "individual" reside in some specific anatomical realm? In other words, individuality must be based or determined by limiting neural storage patterns (engrams).

Now let us examine, not just the two extremes-two brains/two minds of one end of the biological gradient, and one fused brain at the other end of the gradient, but also all the situations between these two extremes. The question then becomes: at what stage of fusion of brains (minds) does one have an individual? Can the answer be only the totally fused brains/minds? And, if so, then what is the definition of an individual (mind).

A dictionary definition of individual is "a single organism as distinguished from a group." The two-headed/one-body situation would therefore be classified as a single organism and therefore an individual—an individual with two minds. It appears that the dictionary definition is too restrictive, not generalized enough.

To what extent and level of connection of duo-brains would the mind be considered an individual mind? One could extend the concept to connected brains in series. Then what would be the individual mind (the individual)—the composite series? But what is the individual mind—a pattern of engrams on two cerebral hemispheres of a brain? The answer seems to be no, since patients with one cerebral hemisphere surely are still considered individuals. If a person loses a leg he is still an individual. To what extent can the individual lose of itself and still be an individual? Germane to this is the problem of how much mental activity is required for the individual to still be said to exist, since brain function is a biological gradient. One would like a strict operational concept for a definition of the term individual, but what function would be best suited for such a purpose? For humans it would seem that the mind is the function of choice, but then what about all other 'individual' organisms—plant and animal?

If brain waves of one area of an *in vitro* brain, such as depicted in the novel *Donovan's Brain* [8], are produced, to what extent must the gradient of engram patterns be in order to say that the individual's mind is existent? Qualitatively which areas of the brain are required before the individual exists? How little functional mind must there be before it is said to be cognitive and existent and thereby signifying an individual?

Discrete neural nets might function between fused cat and human cortical regions such that one might have cat-like interpretations of human initiated thought (once the histo-compatibility and neural junction regeneration problems are solved).

What is the meaning of "I" (as a human organism)? One operational definition would be that it is a particular array of engram patterns that is cognizant of its existence. But the I or individual may be based upon a non-typical engram pattern, such as that coming from a cat/human mosaic patch. Also with the advent of artificial intelligence, even these concepts have to be extended. Conceivably there might be biomechanical (computer) connections of biological minds with artificial ones at an electronic level.

If a flatworm (Planaria) is split bilaterally, then two individuals are eventually produced—a procedure that, in principle, can be continued ad infinitum, thereby suggesting that the individual is potentially an infinite series of individuals. Is an individual Volvox colony an individual organism or a pattern of individual cells that form a colony of individuals? One can clone a new individual from a cell from a prior individual. Again it can

be asked, are individuals really then potentially many individuals? But if one omits aspects of form, then one can conceive, say, ten million cells not as an organism but as some *in vitro* mono-sheet of cells. Is this an individual or is the pattern required? Is some gestaltic thirdness derived by particular patterns that in turn are required to make an individual? Other limiting circumstances would be to have the same number of cells but each with different phenotypes. Although there are not many different tissue phenotypes, say for discussion several thousand evolved to date, it is conceivable that thousands more may eventually evolve some day in the future. Therefore, the quantity of phenotypes of neural cells should not be considered a limiting factor for the argument

With the advances in information regarding such things as histocompatibility gene loci, transplantation procedures and the use of immune suppressors, the biological amalgamation of different species of brains may be accomplished eventually. The cat/human brains would function as a unit. The resulting human mind should have cat-like thoughts in addition to human thoughts. It is not intended here to suggest that, for example, a whole cat brain hemisphere after being transected could be matched somehow functionally or anatomically with a human hemisphere of the cerebrum, but rather possibly, some small portion of the cortex of a cat might be grafted onto a similar cortical area of the human brain. Again, one must add that nerve regeneration technique is a limiting process at this time, but recent use of embryonic neural tissues appears to be a breakthrough allowing for such a potential experiment—not that one would ethically use human subjects either. Therefore, continuing the argument, brain tissue could be placed from one individual (embryo) to another (adult). If one area already with engram patterns (information) is transplanted, neural nets might function (think) differently—thus the creation of a mosaic mind.

The individual may be comprised of a variety of genetic origins such as a mosaic (e.g., fused mammalian blastula cells from different genotypes, gynandromorphs, female and male "hemi-individuals, etc.). Of course, there is the immunological basis of individuality that is quite specific, at least, in unaltered biological systems. Individual plants can be derived from cloned cells from a variety of tissue sources. Thus potentially any cell can become a total individual in the plant world. Neoplastic nuclei can serve as the source of information to create a total individual. Mouse teratocarcinoma nuclei have been placed into enucleated oocytes that proceeded to develop into normal mice [9].

One biological concept of the individual is as a genetic entity with a behavior pattern potentially capable of being isolated from its surroundings and other biological entities.

The ability to have introspection by an individual must be a gradient in the evolution of the mind. Theoretically evolved introspective mental activity could also be attributable to a series of connected brains that would have the ability to know of its existence, and the series itself then becomes the introspective individual.

A definition of a generalized individual might be defined in terms of designated components demarked and identified as belonging to a particular set, the set "I", to be termed individual over some particular time "t". The pattern or array of these components would function or operate as an entity during that time period. Any dissolution of the pattern, e.g., with sufficient time (aging), would terminate that particular individual.

The biological gradient of embryogenesis allows the following problem of individuality. An individual mind develops via a fertilized egg cell that becomes a person A. However, person A could have been person A1 and A2 by virtue of the following. If a thread is placed between the two cells of the fertilized egg (A) after the first cleavage has occurred and then tightened, then individual A's potential mind becomes two different actual minds. So each of us is, in this way, two other possible minds.

Our biosphere can be considered to be a "slim mold" type of syncytium —a continuum of biological systems. Individuals would be pieces of differentiated syncytia. Evolution has favored toward introspective organisms as the individual form, statistically speaking, and not as a syncytial slime mold form. This may be teleologically speaking, to allow discrete behavior instead of a generalized one. Other biospheres or biosphere-like planets in the universe may have evolved generalized introspective systems. Since the universe appears to be imperfect (at least if the earth is a typical biosphere, i.e., in the biological sense such as induced suffering, hunger, trauma, early death, cancer, extreme pain, mental and physical diseases, etc.) individual increments of living material may allow other pieces of living material to receive less of some particular affliction or disease. In other words, the harmful process would be more limiting if it is required to pass from one individual to another. It should also be noted that political aggregates with artificial borders to biological organisms may act as pseudo-syncytia with its domains of individuals. Whereas, a generalized biospheric slime mold, if it were to become anomalous, diseased or perturbed in some negativistic manner, would be more likely to be annihilated than if it were dispersed into separate increments as individuals.

NOTES

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