THE REASON FOR REALITY
[A NON-THEISTIC DERIVATION]

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ABSTRACT. Proposals can be put forward concerning the reason for reality without appealing to theistic arguments. One is offered here. Singularities create their own needs and opportunities. Beginning with a singularity, the concept of imperfection is formulated in order to later create the idea of unfortunates. Heterogeneity is required or allows for introspective entities to evolve. It is contended that the reason for realty is that the evolution of these introspective individuals seize upon opportunities that present themselves, and assist the relative unfortunate entities, be they introspective types or not. This is the reason that becomes existent with reality. Thus, singularities produce or generate their own reasons in reality. Opportunities are created during the evolving process.

KEY WORDS. Opportunity, introspective entities, singularities, limit theory, big bang theory, needs, reason for reality, moral evolution, 'fortunate'/'unfortunates', biological imperfections

THE SIGNIFICANCE OF REALITY

Introductory remarks

There are two primary belief systems—theology and science. In this section an attempt is made to derive, using present day scientific paradigms, the significance of reality and the evolution of introspective entities. Theological interpretations are commonly known and will not be reviewed here.

A proposed "picture" of reality is that rare biospheres contain evolved introspective individuals scattered in the galaxies within the moment of their star-planet lifetimes. Such individuals have the capacity for empathy and are capable of helping less fortunate entities within their domain, especially those evolved with the capacity to receive pain.

The two major belief systems—theological and scientific— have been used to describe and interpret the universe/reality. Theological constructs have been essentially based upon innate considerations. The major relig-

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ions have their historical origins from such ideas. Scientific interpretations of reality stem from whatever present day paradigms/beliefs dictate. Scientific ideas (e.g., cosmological) are mainly devoted to descriptive aspects of reality and are devoid of philosophical interpretations of its significance. The following will be an attempt to derive, using present day scientific beliefs, the significance of reality.

Cosmological aspects

Using concepts of chemical and biological evolution, one can formulate the present day universe with its space-time-energy/matter patterns from galactic to biological structure. But why do these structures exist?

If one had a different pattern of stellar birth, i.e., without solar systems, then the chemical niche for further chemical evolution is terminated. But with cooler planetary accretions biological evolution, which can be interpreted as a continuation of stellar chemistry such as the carbon/iron cycle, can continue. Heterogeneity and imperfection appear to be required elements for these evolutions as previously discussed. It can be noted that social evolution, an extension of biological evolution, has both aspects of good, e.g., hospitals and of bad, e.g., wars.

Biological aspects

Biological evolution seems to explore "all" possibilities of survival with the selection process and thus one sees thousands of varieties in form and function of living systems. This appears to be deterministically/mechanistically driven [1].

However, when the structure for the life function termed irritability evolved and became more complex (central nervous system of vertebrates), it evolved the capacity of introspection [2]. Since biological evolution is driven by survival, one can ask the question of what survival mechanisms are imbedded in the capacity of introspection.

The evolution of introspection is a biogradient and, as the capacity to introspect becomes more efficient, the individual is able to interpret the immediate situation in which it finds itself and can thereby determine what situations may lay ahead relative to its own existence and labile environment. Thus, introspection is another survival feature. But this evolved nervous system power, introspection, also allows the individual to interpret the meaning of its existence relative to the rest of reality.

Overall viewpoint

Examining the evolving universe from a singularity, it seems that an end point in the evolving reality is for introspective entities to appear, al beit, rarely (whenever and wherever the niche allows—see reference 2) scattered about the universe with relatively short lifetimes dictated by stellar

aging and star formation along with subsequent planetary annihilation. Therefore, there is internalized (within its own galaxy) 'sparks' (of perceiving existence) for a moment (life of the star-planet) relative to the total time of reality. Why?

In plant evolution the function of irritability is limited with respect to experiencing pain (no pain centers/c-fibers/etc., exist). Vertebrates have evolved survival mechanisms undoubtedly to notify the individual of injury. This same notification system (pain inducement) becomes involved in the food cycle, e.g., a carnivore killing a herbivore with subsequent 'legitimately'-induced pain. An idealized system would be to have only vegetarian vertebrates. This would leave the individual injury type of induced pain as the only type of pain. Since evolution's broad spectrum approach creates vertebrates with characteristics of the capacity to receive pain, it must have been driven (admittedly teleological) on creating this form, i.e., the form that can support the complicated central nervous system which allows introspection to occur.

The reason that introspective entities exist, if only momentarily, and probably throughout the universe, is a mystery. One could say that these introspective types are able to create 'newnesses' (paintings, poetry, music, fiction) and empathy—empathy towards other less fortunate forms including their own kind, e.g., those that are having pain. Or in more general terms, entities with the capacity to do so should help less fortunate ones existing among themselves. The significance of this effort is obvious in an imperfect universe. Why the universe is imperfect may have something to do with the necessity of heterogeneity in the construct of chemical change, if one is to evolve introspective organisms [3].

Note that the action of helping the less fortunate does not involve any rewards. It is apparent that the main thesis stated here also could be derived from ethical grounds. The typical entity that would be considered less fortunate would be those with nervous systems capable of receiving pain. Such comparative pain analysis would probably have to be based upon the anatomy of neural systems that have evolved. For example, the neural net of a hydra would not allow for the sensation of pain, whereas beginning perhaps with suprapharyngeal ganglia of annelids or orthropterans should allow for the sensation of pain. Of course, subjective aspects of pain are wanting in the phylogeny of animals. One needs to generalize the use of the example of pain for unfortunate entities to all aspects of anomalies, and not just in functional terms, such as pain, but including structural, for instance, cripples and developmental abnormalities and all diseased states.

What would be a test for the validity of these arguments? After making a modest effort in the task of generalizing much of the above, one test would be to ask, "What is missing?" Such comments as "We do not know

the 'ultimates' of nature," would seem to condemn any attempt at constructing significances to reality. But using the boundary conditions of present day knowledge, including the lack of information: i) of whether or not there are other biospheres, ii) of any other introspective entities, and iii) of the workings of their introspection, it is still not obvious that contrary notions of significance of reality can be offered, although additions likely can be made.

An interesting feature of the above idea is the following. Since no mystical beliefs are necessary in this foundation for a significance of life, then the idea should be compatible with that of the philosophy of an atheist. In other words, an atheist could subscribe to the 'kindness principle' even though no rewards, such as eternal life in heaven, are thought to be forthcoming or that no God is watchful over one's moral behavior, etc.

The question of natural selection

How can doing good / being a good Samaritan be selected for and become established via the natural selection process in introspective organisms? Or somewhat more cleverly put, "What good is it to be good?" Of course, one recognizes the very large philosophical issue that the term 'good' creates. Let us consider the term 'good' as used within the realm of humanitarianism.

Early man can be thought of as requiring group efforts for each individual survival. This should have, in turn, required them to have helped each other or doing good in their daily tasks. The selfish 'do no good'-individual who is on his own, then passes out of the picture possibly by lack of protection. Through this simplistic scenario, we can assume the early establishment of 'good' behavior by introspective types.

Curiously, a derivative of the evolution of introspective minds results in those minds that have an appreciation of aesthetics. However, upon close examination this appears not to be completely valid. One assumes that the introspective human has an appreciation of art. But looking at the whole biological world, it is difficult to see how natural selection worked on the principles of aesthetics. One possibility might be that a beautiful mate tends to be a healthy specimen, thereby contributing to survival. One then extends these capacities to the world of, for example, art appreciation. Of course, such a process as sexual selection based upon nice appearances/aesthetics (e.g., a peacock's plumage) occurs, phyla-genetically speaking, long before introspective capacities occur. Thus, one would have to say all introspective minds have aesthetic capacities, whereas not all minds with aesthetic capacities have introspective capacities. This brings forth the point of whether there is a pre-introspective aesthetics as a separate kind of aesthetics as compared with more common categories such as paintings and music, although there have been examples offered

as paintings made by cats and elephants including other non-human primates. Of course, all of these arguments are based upon a rather tenuous believe that we can, from neuro-anatomical considerations, estimate what species have introspective capacities. Furthermore, as mentioned before, introspective function of the brain is surely a biogradient of evolution.

On the rarity of 'I'

The significance of introspective I's (individuals) as the ultimate product of reality is curious in that it is a characteristic of reality that introspective organisms (I's) are actually extremely rare. Even though an introspective "I" is a biogradient of evolution, we will consider I as a typical human. Next, let us explore the number of I's.

At first calculation, it would appear that there could be an infinite number of I's. Let us calculate the number of I's existent at this moment. There are all of the I's on this biosphere, and assuming the addition of I's of other biospheres of stars with 'advanced' biosphere evolution, i.e., those containing introspective organisms, multiplied by the number of galaxies in the observable space, with the final addition according to the limits of the universe, then there is a large number of I's or if the universe is a continuum then there are an infinite number of I's. In ether case one would say that the number of I's is hardly rare.

But what is meant here is that the density of I's in the universe is extremely low (rare), say pound of ' I-matter' per pound of all other kinds of matter, although obviously a certain amount of non-I-matter is required to sustain an I.

Another approach is to say mathematically, potentially the number of I's that could exist is infinite. However, the amount of biological matter is limiting. Furthermore, most gametes produced do not form an individual. So, all those potential fertilizations (I's) are lost for eternity. Thus, considering just this planet, the development of I's is a rare occurrence. The other limiting factors are ageing, trauma, disease and other causes of death/annihilation of the I's that narrow this amount even further. In other words, only a few I's of the potential number exist at any one moment.

All of this presents with an extremely low density of I's per unit of universe, as compared to what might conceivably be devised by negating many of the limitations such as having no death.

The significance of this feature of reality does not, in the writer's estimation, lower the significance of the 'I'. It is quality over quantity.

Having discussed some of the aspects of the significance of reality, the next task will be to examine what is meant by biological imperfection which will be used in the derivation of the reason for reality. It will also be necessary to explore the concepts of "unfortunates."

Cosmological background

The word "imperfection" simply means not perfect where perfect, arbitrarily chosen, would be in a state that does not have a defect or is not diminished from its essential whole.

When dealing with cosmological chemical descriptions of initial events in the big bang theory, the concept of uniformity can be used in the origin of the universe. But the word imperfection is difficult to assign to a homogeneous system that is moving towards a non-homogeneous system. For example, one of the first systems existent in the beginnings of the universe (neglecting subatomic particle evolution) is $H + H \rightarrow H_2$. Electrons attach to H atoms to form negative ions $[H]^-$. The $[H]^-$ ions collide with H atoms forming H_2 and an unbound electron that continues the reaction. A second kind of reaction resulting in H_2 is as follows. Protons and H atoms form $[H]_2^+$ and this form reacts with a H atom to form H_2 and $[H]^+$ [3]. In other words, going from a homogeneous to a heterogeneous system would occur after molecular hydrogen formation and this would occur as a continuum with the exception of required quantum jumps in changes at the level of molecular formation. With gravitational effects and ensuing galactic heterogeneity individual forms/shapes and distribution patterns occurred. One can say arbitrarily, that once there is an established heterogeneity, there would be a state of imperfection relative to the homogeneous state (some 'sub-nuclear soup'). However, immediate quantum jumps that would occur in any homogenous 'chemical soup' would thereby, throughout the gradient of chemical change and the resultant permutations, make the system imperfect according to this arbitrary definition. Even though this is not a good operational definition for the sense of the term imperfect as applied to a system, and which instead should simply be considered as becoming different, it will suffice for our purposes. In other words, there are known imperfections in the universe as will be examined ahead.

Other physical systems

If one considers a pure crystal with exact spacing as being a 'perfect' crystal then, say for example, for a metal 'whisker [4]' with branching of the crystal, there would be a disturbance of the crystalline array in which non-perfect cubes of crystal and slanting crystal structures of skewed arrays would

occur. Thus, an 'imperfect' metal whisker would have less tensile strength, etc. Expanding this idea, a mathematical expression for the 'perfect' or 'regular' whisker would have to be made more complex to accommodate a branched whisker. Using such criteria of reducing a system to a mathematical expression, more complicated aspects would indicate an imperfect state over that of some more basic or so called perfect state.

All of these considerations leave a great deal to be desired. Any hierarchical system would then be labeled imperfect instead of simply an evolved or more complicated thing. What is needed is an operational definition being applied to the system in question. This seemingly would have to have a customized operational meaning to be assessed for a particular system being considered.

Other inanimate systems including man-made systems

It seems that imperfection of inanimate systems such as a rock is difficult to defend. However, an imperfect clock that is always giving the wrong time is easily classified because of its built-in operational definition—to tell time. It also appears that the operational definitions themselves are a gradient of meaningfulness. For example, if one were to devise an arbitrary operational definition such as to say a rock is imperfect if it loses over fifty percent of its mass and label by definition that the original entity was the standard. This takes the gradient concept of operational definitions to absurdity. Thus, the concept of the operational basis for assignments of an imperfect system is itself some sort of gradient as to its significance, which in turn is valued by its human interpretation For example, a crude diamond is imperfect, but if the facets approach an 'accurately-enough' stage, that changes the rough diamond towards a more perfect diamond.

Mathematical systems

In mathematical philosophy it is sometimes debated whether mathematics already exists or is derived. If it already exists, it is difficult to comprehend imperfect aspects of mathematics. In other words, can all mathematical mistakes already exist? So, one can find, al beit, human made incorrect mathematics. Does this mean that all mathematics is derived? Furthermore, if we apply the word 'imperfect' to mathematical expressions then it is not apparent that it necessarily be based on a pragmatic meaning. Such a mathematical expression could be an attempt at a very abstract general concept in pure mathematics, and might have only distant ties to any applied aspects or possibly it will never have any associated human significance.

However, the above arguments can be restructured/reconsidered as follows. If mathematics is divided into correct (perfect) and incorrect (imperfect), then all mathematics could already exist in a perfect state and

simply be made imperfect by making improper constructs. Another aspect that needs to be mentioned is, e.g., a working differential equation may be improved upon by further developments of that particular area of mathematics Thus, what was once considered a correct equation might actually be considered, through hindsight, to have been in an non-perfected form.

Solar systems and biospheres

Let us now return to galaxies and inspect the evolution of solar systems. Since stars are changing constantly as they dissipate their radiant energy, there is created a variety of stars being in various physical states, amounts of energy, etc., and thereby any planetary evolution would be geared to these variations. Since stars are formed, de nova, and devolve to, say, black holes or white dwarfs, the perfect star vs. the imperfect star would be difficult to evaluate. What operational definition would be attached? One could, without any a prior reason, say that those stars which are associated or support biospheres would be correct and those that cannot would be imperfect. This seems to be a very weak argument except for anthropic interpretations. Continuing this line of reasoning, those planets which can and did have biological evolution would not be imperfect; at least until tumors arose on the biological organisms under the example of an operational definition attached in our particular argument or until any other item that evolves that might be considered an imperfect thing. Is Saturn an imperfect planet? According to our operational definition the answer would be yes. This shows that reducing the use of imperfection to just biological things is not general enough.

Cancer as an imperfection

Thinking concretely, let us examine an obvious case of imperfection. As a starting point, a cancer cell is imperfect to the operation of the organism in which it resides and from which it originated. Thereby it can easily be considered an imperfect part of the organism as compared to an organism without this abnormal cell. Although, one may argue that a cancer cell, itself, is perfected for cell division characteristics since it uses nutrients with great efficiency for this process, e.g., a hepatoma cell that does not synthesize normal liver cell products and becomes dedifferentiated to a more generalized embryonic-like state having the characteristics of rapid cell division.

Now consider where this imperfection first arises in the biological world. Tumors have been described in all major phyla except Protozoa where the definition of a tumor mass or clone of cells cannot be considered. Tumors of any type can be generalized to be anomalous and to be an imperfection in the biological world. Tumors of some sort have been described in cells capable of differentiating. Thus, one can reduce the

problem of this particular imperfection down to the phyla Protozoa. Can a virus be imperfect? A nucleoprotein molecule, actually a collection of molecules, seems to be in a perfect array. Therefore, the beginning of imperfection, based upon an operational definition of possessing neoplastic cells, begins at differentiating biological systems.

When we say that cancer is an evolved imperfection we are thus inferring that all prior non-biological systems are not to be considered as capable of possessing imperfect characteristics.

Biological systems

Returning to the transition between inanimate and biological systems this transition is a continuum—evolutionarily speaking. Of course, discussing this at the level of protozoans, bacteria and viruses, makes the operational definition of neoplasia invalid. What can be used to test the concept of imperfect amoebae, *E. coli* or vaccina viruses? Let us use mutation as a potential standard of imperfection. Exploring this idea, if the mutation is lethal, such an amoeba would be imperfect compared with an amoeba without this mutation. The same argument could be given for, say, a bacterium whose mutation makes it sensitive to some chemical in its environment or a virus that has a defect in its coat protein making the virus unable to reassemble its operational form from an incorrect protein structure. So imperfections in biological systems exist based upon a selected operational concept from the point of view of the biological entity so designated.

Social systems

Since social evolution is considered an extension of biological evolution, imperfections in social life, i.e., wars or problems in food distribution or cruel totalitarian regimes, etc., would be imperfect aspects in the function of society. A perfect society (utopia?) is the other pole of this state and is impossible to define since difficult concepts of, for instance, happiness would be involved.

Summary

In summary, the use of the concept of imperfect when applied to a system requires an attachment of an operational definition that can be used as a reference or standard. It is noted that such operational definitions become less significant or meaningful as one diverges from biological entities or human values. Indeed, it is easy to attach imperfect to a human oriented system such as a machine.

The overall concept of imperfection requires a subjective interpretation which may also be relative to a multitude of surrounding situations and connected events and probably is best interpreted mathematically as a fuzzy set.

In conclusion, from this discussion there are no uses of the term imperfection in some general sense that can be applied to all things in the universe. The term must be reserved for extremely specific and well defined systems unless one was to arbitrarily say that the universe itself is imperfect (as compared to an imagined perfect one?).

The above point of view is reasonable in terms of normal vs. pathological systems. However, one could easily assume that normal cells, themselves would not be considered perfect in that they are constantly changing—changing if all cellular functions and morphological aspects as a function of time are considered. Are all these states at any selected moment perfect? And if so, why are the changes necessary? Yet, it is given that concepts of dynamics are a requirement in the definition of a living state. Therefore, the discussion can be restated in terms of perfect changes and imperfect changes, from state A to state B. Does the evolving state that presents itself as biological evolution require imperfect moments in order to achieve what we accept as evolution's time arrow of change?

A NEW FORMULATION OF FREE WILL AND ITS USE IN INTERPRETING REALITY

Pure free will is considered in this paper to be non-existent. What does exist is 'quasi-free will' which is formulated to have both genetic and environmental modifying factors associated with it that may, with limitations, approach but never reach 'pure free will'.

Fortunates and non-fortunate individuals (this would include organisms other than humans, especially those that are capable of receiving pain, physically or psychologically) are discussed in terms of human subjects as an example for using quasi-free will. Fortunate introspective entities (humans) can chose to help unfortunate people.

A universe devoid of introspective entities can be compared to a universe with introspective activity. It is concluded that a meaningful reality, i.e., empathetic, reflective, aesthetical and creative requires an introspective universe. In other words, these features greatly enhance the significance and meaning of reality, though the ultimate reason for reality is not known.

A new formulation of free will

A major contention to be presented is that free will ('pure' free will) is an ideal that cannot exist and is thereby not operable. Free will cannot be reached, only approached, because of the following considerations. Since an organism that is said to possess free will has a genetic background, such gene activity will modulate behavioral components (e.g., a large amount of epinephrine that is produced because of inherited traits causes rage in a person who is attempting to chose not to engage in a brutal fight).

Furthermore, the continual history (environmental, social, psychological, etc.) of events during the life of the person (e.g., a severely beaten person by his mother as a child sits on a jury and is asked to reach a verdict on a case of a woman who has critically beaten her child) will also modify any choice process that may be attempted by that person. Thus, the concept of free will can only be approached in its usage by such an individual. He/she can never be free of modifying factors. The choice of some specific action/behavior will not be a 'pure' A or B choice without a multitude of modifiers. It will be a collection of hereditary features plus an accumulation of historical events that will affect the person making some choice. Let us term such a modified free will as a 'quasi-free will'.

The biology of fortunates and unfortunates [5]

As previously expressed [1] reality has introspective entities that apparently has evolved via big bang cosmological mechanics. These introspective entities can chose by the use of quasi-free will to help (hopefully) less fortunate entities as compared to themselves.

One can derive this situation by stating that biological systems demand change not only in their dynamic molecular composition but in their overall developmental changes which will evolve into an ageing process. Of course, a biological situation with no development is impossible and with no ageing is static and becomes a plateau ending in consequences of there being no biological evolving processes. Ageing, itself, causes imperfections in an organism and thereby generates less fortunate individuals in a very natural way. Biological variation which occurs constantly also would contribute to less/more fortunate individuals (e.g., diseased and non-diseased persons).

Introspective and non-introspective universes

The significance of this world picture can be tested by asking what difference does it make to have introspective elements in a reality over that of having no introspective entities present.

Several cases can be presented: firstly, a universe with no biospheres or introspective minds to contemplate one's existence and secondly, a limiting case of one biosphere in the universe (all that is needed for the argument) which has evolved introspective organisms. And thirdly, there is the case of a universe with an, as yet, potentially developing introspective biosphere.

In the first case one has a reality but it is not being analyzed, inspected, or contemplated as to its meaning or significance. The third example is in a similar state. The second example has its reality under scrutiny (like what is being done here). The question is; what difference does it make in the

significance of the meaning of reality between an 'introspective universe' and a 'non-introspective universe'?

Theologically one can say that an introspective universe allows one to give thanks to a creator for one's existence.

A non-theological viewpoint would lead to such considerations as an infinitely pulsating universe (singularity/'big bang' expansion/'big crunch' contraction/singularity cycles) where a godless universe seems sufficient for it does not require an originator. God would be reduced to a superfluous entity.

The significance of a non-introspective universe does not lend itself to any empathetic behavior and indeed the pre-hominid (non-introspective reality) history of this biosphere did not seem to possess any help for unfortunate organisms from others beyond perhaps maternal, among others, instinctive driven behavior.

Since the occurrence of the less fortunate is derivable from biological mechanisms, the introspective type reality attempts (teleological) to compensate or cope with this situation, whereas a non-introspective reality would not.

The non-introspective universe gives little insight into the meaning of reality. However, since there is at least one introspective biosphere in our present reality, it becomes a moot point.

There is a very important feature of the introspective universe in that it originally was non-introspective, i.e., for instance, at the primordial pre-atomic particle soup stage—it definitely was not introspective. Then at a later stage, I am introspecting from this same system. Thus, non-introspective systems can create an entirely new kind of system—by evolving complicated systems organisms with holistic/gestaltic abilities that advance to introspective awareness.

The big question is "Why does this occur?" Although the evolution of an introspective universe could be deterministic and be caused by natural selection mechanisms, it still does not delude the fact that an introspective quasi-free will system will break from the deterministic path to create a new behaving system—that of a non-deterministic and choice selecting one under the limits of using quasi-free will.

Summary

In summary, a non-introspective/non-quasi free will system (e.g., pre-atomic soup) creates another more complicate non-introspective/non-quasi free will system (e.g., an amoeba) that in turn creates an introspective/quasi-free will system (e.g., human) that has fortunate people that can help less fortunate people that are necessarily evolved from the overall biological variation processes (genetic and environmental variations).

Thus reality consists of entities that have the capacity for empathy, aesthetics, etc.

Does this answer the question of "Why reality?" I think not. If there were a minimum of unfortunates, then one might declare the reason for reality is because of all the goodness and pleasure that exists. However, based upon this biosphere (the earth considered as being an average biosphere), there are too many unfortunates in broad terms and too great an amount of pain induced in restricted terms, to say that the reason why reality exists is based upon some pleasure principle (e.g., the evolution of the central nervous system could be based upon seeking pleasure).

The ultimate answer may require theological concepts. For now we have this 'picture' of reality but only immediate reasons related to reality—to help correct its imperfections, to enjoy its pleasures, to be able to do creative innovation, etc.

In conclusion, the ultimate reason for reality remains to be derived. But let us attempt to derive it.

THE REASON FOR REALITY

Reality exists, but why? Evolution creates entities with the capacity for introspection.

The reason for reality is to give an opportunity to entities with this feature to use their introspection. Therefore, the most simplistic understanding of the meaning of a heterogeneous imperfect reality is to help in alleviating the imperfections that occur during the evolutionary process, at least those that effect individuals in the immediate vicinity of their existence.

Reason, itself, is the basis or motive for this action after rational thought. To some the phrase 'the reason for reality' suggests purpose and design, but this does not necessarily apply. There could be a non-designed evolving system leading to entities capable of interpreting and changing their situation, especially for those individuals that are seemingly less fortunate. This capacity to reason and introspect can be made/evolve without any grand overall purpose.

Logically speaking, reality can exist or not exist. The only other conceivable state would be a permutation of this and thereby have it exist for a period of time and then not have it exist for a given period. A 'flicker' frequency of exist/not exist might be conjectured.

Selecting the state that reality exists continuously, we can proceed to suggest the reason for this existence. As has previously been developed, there is an evolution of introspective entities from a non-introspective situation to the formation of biospheres with potential introspective entities. It may be that introspection is a way to manage a developed system.

Such introspective organisms can help modify, e.g., add principles of progress or potentially destroy progressions during evolving civilizations according to the knowledge of that time. Such introspection can 'correct' many imperfections. These imperfections appear to be innately built into cosmological evolution in order to achieve heterogeneity of chemical evolution, which, in turn, allows for organic evolution and the development of introspective entities.

Fortunates / unfortunates

In review, one has the sequence: singularity → homogeneity → imperfections → heterogeneity → non-introspective entities → introspective entities → unfortunates/fortunates → modified existence of progression. Such modifications would be limited to introspective-type biospheres in the cosmos.

The unfortunates exist due to the normal characteristics of having heterogeneity, because evolution which in turn produces a broad spectrum of potential 'happines-acquiring'entities (from, e.g., just being able to satisfy hunger spasms to, in colloquial terms, 'have a heck of a good time').

The overall progression seems to be the production of fortunates with the minimizing of unfortunates in the *required* imperfect system (i.e., required for evolutionary mechanisms).

Human biological arguments

When we speak of 'the reason', we automatically have involved ourselves with some sort of personification. To reason is to contemplate usually through some logically constructed system some relationship between subjects. We have in one system of reality, entities with the capacity to reason, possibly including other hominid species besides humans. We can interpret that the system includes entities that can reason. Furthermore, we can ask the question, "Why does the reality system have reasoning types?"

But let us begin a little more mundanely than this and do some reasoning on reasoning. The following is not a rigorous logistic treatment. It is meant to relay typical thoughts anyone might have in attempting to derive some significance to this subject.

If one uses one of the purest kinds of thought, mathematical reasoning, one could premise that either there is a reality or there is no reality, a binary l/0 sort of thing. If there is no reality, then 'game over'. Although one might challenge this by saying "Why is there no reality?" (This might be a bit difficult to do.) Furthermore, what is all of this that is being experience? I think the "haves" have it and there is a reality to be argued about. The argument is based upon the question, "Why is there a reality?" The immediate reply must be "Why not have a reality?" These sorts of cyclic

arguments do not lend themselves for the possibility of creating many satisfying reasons *for* reality.

Operational arguments

A more interesting discourse is to challenge the significance of reality. For what possible functional/operational workings could reality have? *A prior* to that question is the possibility that it exists for no reason. Purposes surely assign reasoning entities of some sort in a design motif for the origin of reality and this begs the question of an entity, be it personified or not, behind design of any kind. Of course, these thoughts have been presented elsewhere and, in general, in religious thought. The important thing to be said here is a presentation of mechanistic evolution producing non-deterministic gestaltic entities with introspective capacities such as those derived previously [3].

These entities give a basis for a significance of reality; a reality that includes emotional interpretations such as love/hate or analytical interpretations such as wave mechanics/Newtonian mechanics.

The evolution of an imperfect [6] system

Let us examine the creation of pain from a singularity as an example of a characteristic of an introspective entity. The unevenness of the expansion from a singularity of space-time-energy led to chemical evolution that exists today in localized high thermal niches with the continued birth of stars and, for example, iron-carbon cycles as in our sun. Chemical evolution can continue as organic evolution creating identities with the capacity to introspect. This ability gives uniqueness to the evolution of a biosphere. This uniqueness is for the introspective entity to recognize not only the environment around it but also its own existence. Such an organism can purposefully change that environmental situation. With notions of good and bad such changes can be directed toward either of these positions. Since homogeneity progresses to heterogeneity, the broad spectrum of heterogeneity presents with unfortunate entities and situations relative to more fortunate ones, e.g., the various states/amounts of pain and, in general, the existence/interpretation of having empathy for less fortunate subjects.

Introspective entities have the capacity and opportunity to attempt to change unfortunate situations to less unfortunate ones. Thus, the process that produces entities with these capacities at the same time produces a variety of entities with various states of 'fortunatenesses'.

Natural selection of fortunates helping the less fortunate

Natural selection for this behavior of fortunates helping the less fortunate does not seem to work, for it is well known biology that usually less genetic

correctness eventually will decrease the fitness of the specie. If a species does not evolve out of its breeding group, the less fit (less fortunate) will eventually cause the whole species population to become less fit for survival. This capacity to interpret and help unfortunate individuals seems to be a unique feature for introspective entities. Such activity may require added modifications to prevent a downward progression of fitness.

Thus, human derived concepts of humanitarianism does not need to be based upon theological concepts, but is, evolutionarily speaking, a new feature for the human evolved specie. At first glance, it would appear that helping unfortunates would be a function that is based upon a theological interpretation, i.e., doing good to save one's own soul, etc. But such an operational definition can be derived purely on scientific premises and need not be reduced to theological interpretations.

Summary

The overall development of space-time-energy that, at first, forms a homogeneous system of baryons, eventually creates a heterogeneous array of introspective organisms. There is a great variety of individuals resulting in this process. Some that exists with, say, less effective features (the more unfortunate) than others (the fortunate). Since introspective entities have the ability to introspect (be aware of their own existence and relationship to the situation and have insights into their capacity to interpret and change things), they may choose to change a great deal of the circumstances of the less fortunate. This opportunity is given to reality and appears to be the reason for reality.

Addendum

It might appear that the items of love, friendship, reveling in the arts and sciences, etc., have been neglected in the reason for reality discussion. These elements are to be understood in the term 'fortunate' which is used in its broadest meaning. Furthermore, such aspects as these are perceived as giving happiness to individuals who therefore would be considered as being fortunate. An opposite example would be people that have obtained little education and who might easily be swayed into brutal behavior for, say, a cause, would be classified as unfortunate individuals relative to those individuals who have had access to a broad educational base (the more fortunate).

FURTHER REMARKS ON THE FOUNDATION OF REALITY

Need

Need is closely associated with opportunity. Since the concept is for introspective organisms, as introspection evolves, to interpret their indi-

vidual situations and when less fortunate organisms, e.g., those with hunger are uncovered/discovered, then this is deemed to be remedied. In more concrete terms, if there is hunger, then there exists the need for food and this presents the opportunity to fulfill this need. Thus, reality is an opportunity to correct/omit the need. These needs appear in various states of intensity because of the broad spectrum of variation of various aspects of reality.

A short version of the overall argument is as follows: one observes his imperfect surroundings and decides/believes what he should do to improve upon them. Then he interprets his actions to be the reason for his existence. This is the narrow case. In the more general case, improving the imperfect situation is interpreted by an existing reasoning entity as being the reason for total reality.

Reason for singularities

It is the writer's contention that the reason for reality is to present an opportunity for fortunates to help unfortunates [1]. If singularities are the origin/beginnings of reality and if one uses the phrase 'the reason for', then this appears to require a 'god creator' to give reason to the singularity. (See the discussion of theism and singularities in reference 3.) However, I believe that the development of a singularity into an introspective entity is another example of a biogradient (originating from non-biological gradients). In other words, the gradient, via bioevolution, of the introspective capacity allows for the reason for reality to, as a gradient, appear gradually upon the biosphere. Thus, the phrase 'reason for' need not require the presence of a creative entity prior to a singularity's existence. This would allow, for example, a godless continuously pulsating universe that begs of or requires the notion of helping within the confines of this imperfect system which, in itself, is required for a developing system.

In other words, just because the reason is not apparent at the singularity stage of reality, it does not mean that at the introspective entity stage, the reason is not a valid argument/idea/conclusion.

By reducing the origins of reality to a singularity formed from nothing, there seems to be a minimum involvement of a creator or personal god. Yet, there can be the notion that such an overall process, although having a 'nothing/zero' beginning, has the capacity to evolve 'god-fearing' introspective beings. Thus, although the same described process may be a god-less spontaneous one, the choice behind god or god-less remains exactly that— a choice. If one chooses the god-less creation then there still is the evolved introspective entity that happily chooses (hopefully) to help the less fortunate in their plight/midst.

In either case the same ultimate thing occurs: that of improving/regulating a less than perfect situation-reality.

Smith [7] has done a rigorous interpretation of singularities using metric, Ricci tensors and space-time manifolds, classical cosmology (not string theory or chaotic inflationary theory), and synthetic *a prior* "everything that begins to exist has a cause" philosophy. He concludes that singularities probably have a cause and that the singularity is not a theoretical fiction but a reality. He speaks of the singularity as a boundary of a manifold of events. In the classical big bang theory the singularity existed about fifteen billion years ago when the universe's radius was zero and the density of matter was infinite as was its temperature. It is also conceived as the beginning point of space-time and thereby the first instant of time. The Hawking's principle of ignorance says that singularities are inherently chaotic and are unpredictable. [Thus, it can give rise to a heterogeneous universe.]

It is understood that unless there was heterogeneity there would be no less/more fortunates. To not have this would require that every 'unit' of environment with an individual would be exactly the same-a sort of 'super clone'. Otherwise, one has differences of a greater or lesser degree and these differences create the diversity that in turn creates the lesser or greater fortunate situation and individual. But heterogeneity is necessary for this process. It is the heterogeneity that exists in reality that allows for the evolution of introspective/interpretive minds.

The idea that singularities are chaotic fits with the early state of the universe as being in maximal chaos and therefore complete entropy resulting in a macro-state of thermal equilibrium. Smith [8] has discussed that singularity mechanisms are so unpredictable as to their outcome that an omnipotent god would not use such a process to produce a desired animate universe. Therefore, it must be a godless act. [I suggest that an imperfect god might use (require the use of?) this process in attempting to create an animate universe.]

Theological vs. non-theological implications

The results are the same. The reality that appears forms relatively less fortunate entities that require assistance from relatively more fortunate individuals. This includes potentially all kinds of sensation-receiving entities. God would be said to create singularities from nothing or singularities appear spontaneously. Note that time and space do not exist at pre-singularity stages, if one an speak of stages.

Imperfect biology

The mechanics of a biological system in a physical reality is fraught with accidents, the normal 'wear and tear' of living. One could picture this by saying if one lived long enough , your left little finger will become crushed or amputated. Furthermore, eventually all of your fingers, limbs, etc., will

be non- operational to the extent that your body will disintegrate. There could be an argument made for bionic repair. Then one needs to extend the process to parts of the brain and given the capacity to repair cortical lesions, the historic collection of engrams that represent the 'I' would be lost-case closed. Thus, one sees that accidents or even intentional trauma, will cause a great increase in physical and mental unfortunates either gradually or instantly. There seems to be a necessary ratio of unfortunates to fortunate when each is defined [9].

Let us contest the fortunate/unfortunate idea by making the notion of the reason for reality-happiness, which seems to be a reasonable reason. But I contend that happiness is simply a feature of 'fortunateness'. Therefore it is already included in the scheme. And this can be extended over the array of things that contribute to making one fortunate. Exploring this further, happiness cannot be the reason for reality in that the opposite and equal attribute of unhappiness that is embodied in the term 'unfortunate' would be as likely a candidate for the reason for reality. Although it might be true that the reason for reality is to create an opportunity for unhappiness, I suggest that my original concept that it is not these characteristics that is to make the reason, but it is the action based upon these features.

It can be added that to contemplate one's existence and then realize any fortunate aspects as compared with other venues/situations/persons, may not be necessarily very pragmatic or operational. However, these contemplative notions might be worthy of consideration in interpreting reality an its meaning for any specific person's activity.

Hauser [10] has a theory that evolution/natural selection of a universal moral grammar enables us to make decisions of an ethical nature. Such a set of principles are literally inherited and form the basis for developing moral systems of an individual. Furthermore, he says that such principles dictate how one interprets the nature of harming/helping others.

Something from nothing

A Greek philosopher once said that one cannot get something from nothing. The interpretation of a singularity is as follows. 'Space-time-energy/matter' is derived from a singularity which is defined as an infinitesimal point that produces the universe via the 'big bang' expansion, being careful to consider the general relativity basis for the expansion and not a Euclidian one to alleviate the problem of having something to expand into. If one were to examine some quantity of 'space-time energy' at some interval of that expansion and assign it Q at t=x, which is to be denoted by having space-time-energy ($s_1t_1e_1$,$s_2t_2e_2$,...,$s_nt_ne_n$) taken at a certain interval of time $s_xt_xe_x$ and having at that stage of expansion some measurable properties. Then one reverses the process from that stage Q_x and then examines the infinite series as a function $f(Q_x)$. Using limit theory one can

test the concept that something, a singularity came from nothing/0. One of the basic rules for evaluating limits at infinity for a rational function: $f(x) = p(x)/q(x)$ is if the degree of p is lower than the degree of q, the limit is 0 if the limit at infinity exists. Therefore, the lim $f(Q_x)$ when $x \rightarrow 0$ equals 0, and one should be able to say that the space-time-energy unit Q_x approaches zero. However, having said this, one still does not have the transition from something (Q_x) to nothing (0), since limit theory provides the function as an approach to zero but the function does not achieve this limit.

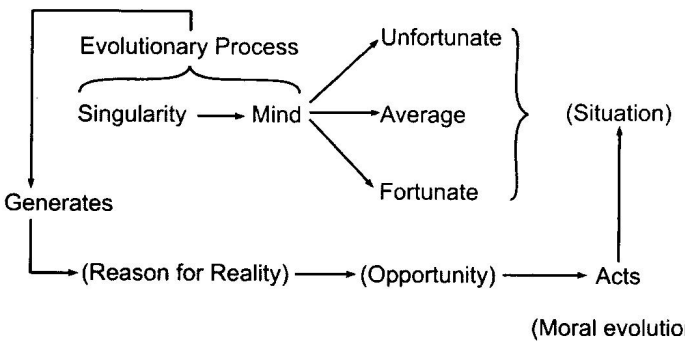
Thus, singularities cannot be described in wordage that regards it as having ever been at zero. (Note the use of 'ever' which is a word related to time and yet, if $f(Q_x)$ were at zero there would be no time.) If one concludes that singularities/infinitely small point do not come from nothing, then they must come from something—that infinitesimally small portion of the 'big crunch' from a previous universe? Such is the nature of singularities.

A general statement

A general statement can be made as follows. There may be many universes (or many repetitions of one singularity) being made with subsequent big crunches because of the chaotic nature of the physics of singularities. The only universe(s) from these that are subjected to introspection, and therefore realization of their existence, are those that are not perfect. In that subset would be the ones having evolved heterogeneity that in turn, allows for introspective entity type evolution. The other universes are 'sterile' and are therefore never observed or realized. We therefore would exist only in an extremely rare (due to specific physical requirements for formation of atoms, etc.) and imperfect universe.

DISCUSSION

The overall scheme is presented in this figure:



An important point to be made is the contention that during evolution, there is a gradient of more and more need that develops for helping the relative unfortunates with their capacity to receive sophisticated irritability, i.e., complex neural nets. Therefore the biosphere's evolution creates its own reasons for its actions of helping where there is need.

Conceptually, what this all means is that you and I originated from a singularity because singularities are chaotic in their physical laws (that they really do not obey) which, in turn, produce heterogeneity. You and I have the capacity to inspect our vicinity and assess, according to our interpretation, any 'wrongs' that can be corrected. These so-called wrongs, e.g., suffering, are the normal outcome of an evolutionary progression of heterogeneity. In this case, it would be bioevolution (as distinguished from cosmological/chemical evolution) and bioevolution develops structures /mechanisms though natural selection for self-preservation. However, some of these features also allow for what can be considered as negative aspects, e.g., pain or social events such as war.

Thus, there are needs for corrections and reasons of/for reality as it evolves/develops during the mechanistic process of cosmological evolution.

Of course, singularities have no reasoning activity. So the reason for reality is a retrospective notion. The concept 'for a reason' is through the evolved system that has the capacity to reason and interpret reality.

It is to be emphasized that the above is considered a derivation of a reason for reality without the use of religious/theological thought. This does not, however, suggest one way or another for a god-like entity as a creator source for reality. It merely represents a possibility of it being non-god requiring.

The multi-universe theory may lend itself to the achievement via a chaotic process (singularities) of universe formation and of the eventual creation of a universe with those physical attributes that allow fundamental quark formation or as advanced as planet formation and finally of introspective entities that can form in appropriate universes and furthermore, will recognize the inequalities of micro-environments, in the relatively few (one?) universes as they relate to such things as, for instance, human suffering (unfortunates). But, at the same time, individuals can receive happiness (fortunates) from pleasurable experiences in this reality.

In the final analysis these generalized concepts that are derived from non-theistic notions can be seen to be valid for an atheist as well as for a theist.

Conclusions

It is concluded that the evolutionary process itself creates needs in reality that give co-evolved introspective entities an opportunity to help relatively unfortunate individuals that are found in the broad spectrum of all

individuals. This is the activity that generates or 'auto-produces' its own reason for reality.

Singularities generate reasons. If singularities always existed, e.g., the pulsating universe, then the reason for the singularity is to give an opportunity for fortunates to help unfortunates. There is no need for human-like emotion to be required for the origin for singularities. Singularities produce human-like emotions (after chemical and biological evolution has occurred). The reason for a singularity and for reality is made/accomplished by the introspective entity through the interpretation of evolutionary processes retrospectively.

NOTES

1 Hancock, Ronald Lee (2005), "Biological inevitableness," *Ludus Vitalis* XIII(24). 25-28.
2 Hancock, Ronald Lee (2005), "Problems of introspective individuals," *Ludus Vitalis* XIII(23):73-85.
3 Hartquist, T.W. and Williams, D.A. (1995), *The Chemically Controlled Cosmos*. Cambridge: Cambridge University Press.
4 "To observe the binding of cold atoms around a wire (described below) we needed a long, thin wire. One potential method for producing such a wire is to use an old technique of growing metallic single crystal metal whiskers. Although it is surprisingly easy to grow forests of these whiskers in a rather uncontrolled, it is a much more difficult problem to grow them on demand, at a certain location, with a particular crystal orientation. Although the wires needed for the atom-orbits are now being produced by other methods, the technique of metal whisker growth is still being pursued. One reason is that single crystal iron whiskers produced by this technique look like they can be used as the tip in an STM (scanning-tunneling microscope), perhaps as a source and/or detector of spin polarized electrons. This would be of great interest in the emerging field of spintronics. Additionally they are in the source of the wires in the electromigration experiments described above" (Micheal Burns, "Single crystal metal whiskers," at:http://www.rowland.harvard.edu/labs/burns/index.php).
5 A personal note on the use of 'fortunates' and 'unfortunates'.'Fortunates' and 'unfortunates' are from 'fortunate' and unfortunate' which are adjectives being used here as nouns. What I mean by 'fortunates' are those people who are more fortunate when compared to others termed 'unfortunates'. If we examine some extreme examples this is quite reasonable. For instance, compare a healthy family living in a typical suburb of Phoenix, Arizona, as compared with a family near Mega, Ethiopia, who do not have enough energy to crawl on the ground outside their skin tent to search for grass to chew. Now consider the examples between these two. Some would be more fortunate than others. One could challenge the simplicity of this by saying that there would be quantitative and qualitative aspects to the characteristic of being fortunate/unfortunate in some specific situation in time and place. This is indeed true. But common usage should allow the above to hold. (Actually, Wittgenstein would probably have argued about the use of most of the terms in this paper.)
6 What is meant in this writing by the word 'imperfection' is something that has deviations from an infinitely homogeneous idealized 'perfect' distribution of particles leading to, for example, the non-equidistant 'imperfect' galactic distribution patterns. It is not obvious what differences would occur in the evolution of biospheres originating in galaxies that were in perfect arrays. And, al beit, more difficult to define, is the biological imperfections or differences from the norms that are considered deleterious to the individual or specie under consideration. If this definition of imperfection is taken to limit, all biological things are imperfect and to some extent this is true, e.g. can one say there are perfect cells that are infinitely efficient in their division of labor tasks? However, this concept is not emphasized here, nor is it necessary for the arguments and would only point out that it is also true that there are no 'perfectly fortunate individuals'.

Furthermore, it is to be noted that the above discussion and derivations are based on, of course, the present knowledge of the universe and a statistic of one biosphere. Also, one should keep in mind that all of the major elements used in the arguments are actually biogradients. For instance, if some feature of a human is denoted, it would actually involve individuals from an evolutionary gradient throughout the history of *Homo sapiens*. However, the fact that for humans the immediate predecessors have become extinct, would allow *Homo sapiens* to possess uniqueness such as keen introspection capacities compared to other pre-human species, since the biogradient has been disrupted in the actual existence of these intermediates.

A discussion from a theistic standpoint of the use of the terms 'perfection' and 'imperfection' can be found in an Internet Infidels Discussion Board "Perfection vs. imperfection" at htt://www.iidb.org/vbb/showthread.php?t= 80155

7 Smith, Q. (1994), "Did the big bang have a cause?" *Brit. J. Philos. Sci*. 45: 649-668.

8 Smith, Q. (1991), "Atheism, theism and big bang cosmology," *Australasian J. of Philos*. 69: 48-66.

9 There's a major problem that arises with the above notion (fortunates helping less fortunate) and that is the evolution of omnivores and carnivores from primitive metazoan filtering systems that do not discriminate between zooplankton and phytoplankton. Thus, the evolution of meat eating and pain induction during the natural food-getting processes does not prelude the notions above, yet, it appears to be anti to this line of thought. It seems progress would be to disallow all killing of pain-receiving animals in nature and by human activity. Therefore the attitude/policy of fortunate towards this problem is not apparent. Furthermore, since this is based upon ingredients, where is the 'cut off' point? It appears that since evolution has already established these biological conditions, only corrective measures could be introduced and this is obviously impractical and one has to conclude that this is part of the imperfect universe.

One other aspect that needs discussion is the use of the term 'unfortunates'. The less fortunate could be less fortunate in a few ways or in many ways compared with a particular individual. We could compare for discussion purposes a person or other animal (or plant?) that is less fortunate for one selected item/feature compared to another biological entity. After such generalizations, the usual situation would probably involve one person compared with another in a particular situation. For example, if a person is dying of cancer, he would be considered less fortunate than the person that did not have cancer. It becomes obvious that the person without cancer was less fortunate than the person dying with cancer if the assessment is based upon trauma, since the particular person in question was killed by being injured by a truck the next day—the cancer victim living for another eight months with good pain management before perishing.

This scenario simply shows that a variety of comparative classification schemes would have to be devised for the use of the relative terms 'fortunate' and 'unfortunate'.

10 Hauser M. (2006), *Moral Minds: How Nature Designed our Universal Sense of Right and Wrong.* N.Y.: Harper-Collins.