

# The Quantum-Mechanical Frame of Reference

## Part 3: Inside-View Physics

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Abstract: As shown in Part 1, the physical reality encountered, and on which quantum physics experiments are performed, is the superposition of a whole class of decoherent quasi-classical worlds, a second-logical-type phenomenon, hence the paradoxical results. This is the physical reality of the protagonist defined by Everett (1957), the record of observations. The collapse dynamics impossible in the quasi-classical world occurs naturally in this world superposition. Everett's formulation has a physical ontology.

In humans the protagonist defined by the record of observations takes the form of a three-dimensional field of information, the perceptual reality, here the 'world hologram'. Because the physical reality of the protagonist is determinate solely where observed, the world hologram defines the sole determinacy of the physical reality encountered. Thus the individual is the reality experienced, and significant in a manner incomprehensible in the current paradigm.

For better or worse, the implied phenomena are isomorphic to certain myths and legends. As above so below applies. This, however, is simply inside-view physics. Crucially, the new paradigm offers the breakthrough in the global human culture that is so desperately needed. In this kind of physical reality, egoism is not just personally disastrous in the long term, but also running the human culture over a cliff. Understanding the personal identity to be defining the determinacy of the effective physical environment encountered does not eliminate ego but transforms it. This alters the life position, which solves the problem. This is the next evolution of humankind, a basic requirement for survival and prosperity.

# 1 Multisolipsism

As described by Tegmark (1998, p. 23) there are two different types of frame of reference fundamental to physics, objective and subjective, the inside view and the outside view. As demonstrated in Parts 1 and 2, they are of different logical types. The key implication for the quantum theory is that the universe is operationally bi-level. The evidence is the two fundamental and incompatible dynamics. It means that there are two quasi-ontological realms.

Naturally, on the objective, outside view, it is the physical reality that defines the information it instantiates, the inside view. *On* the inside view, however, this structure of information defines the determinacy of the physical world. As a result, on the inside view, the record of observations defines the effective physical environment. As described in Part 1, there is a fundamental ontological dualism: the universe operates two different quasi-ontological frames of reference, of different logical types.

On the outside view, the world is as defined in the modern scientific paradigm, the quasi-classical world. The universe of the unitary wave function is all possible worlds. On the inside view, however, the world is a world superposition, a class-of-worlds-as-a-world. Because this is defined solely by the record of observations, the world hologram of this individual, this means the world is personal: the universe defines personal, physical, parallel realities. As stated in QBism:

This means that reality differs from one agent to another. This is not as strange as it may sound. What is real for an agent rests entirely on what that agent experiences, and different agents have different experiences. (Fuchs et al., 2013, p. 3 )

This is the first conceptual revolution. The key implication is that the individual is the only one fully real and defined in this world. Others are determinate only to the extent observed, so this is a kind of solipsism. As this is true for all individuals it is here termed multisolipsism. This fits the facts.

Everett shows that the standard formulation of quantum mechanics as physical process is untenable, and then names solipsism as an obvious, fully working explanation:

It is now clear that the interpretation of quantum mechanics with which we began is untenable if we are to consider a universe containing more than one observer. ... We must therefore seek a suitable modification of this scheme, or an entirely different system of interpretation.

Alternative 1: To postulate the existence of only one observer in the universe. This is the solipsist position, in which each of us must hold the view that he alone is the only valid observer, with the rest of the universe and its inhabitants obeying at all times [the linear dynamics] except when under his observation.

This view is quite consistent, but one must feel uneasy when, for example, writing textbooks on quantum mechanics, describing Process 1, for the consumption of other persons to whom it does not apply. (1973, p. 6)

This is the beauty of multisolipsism: while the solipsist frame of reference resolves the paradoxes, as the epistemological interpretations demonstrate, the textbooks *do* apply to everyone because everyone is in their own 'universe', their class-of-worlds-as-a-world.

This is essentially a type of many-minds concept. As Donald states:

Many-minds interpretations of quantum theory are many-worlds interpretations in which it is argued that the distinction between worlds should be made at the level of the structure of the individual observer. (2014)

Here the distinction between worlds is made specifically at the level of the world hologram. This is a many-world-holograms theory. The ontology is the world superposition. For each individual "observer", as described in Part 2, the world hologram is the the physical world encountered is a many-worlds reality.

The truly extraordinary implication is that the individual, the world hologram, is what defines the determinacy of the world encountered, the many-worlds reality. The individual is the reality. As stated by Mitra: "... each element of this multiverse is an observer, not some universe." (2012, p. 2). The observer in this context is defined in experiential terms, and thus corresponds to Tegmark's inside view, the record of observations, here the world hologram and the individual person, the functional identity. In other words, the individual is the reality experienced, the world hologram, and this defines the determinacy of the physical reality encountered, the world superposition.

This is the origin of principles that embody certain great myths. The concept of as above so below makes no sense in the context of the ordinary quasi-classical world, but this is a phenomenon idiosyncratic to the world of this individual. It is inevitable in the personal world defined by the world hologram, the individual herself or himself. It is not of course that the real world is all in the mind, as has been proposed in various philosophies. What it does mean is that the observations made by the individual are of extraordinary significance.

## 2 Interactive Destiny

As shown by Mitra, the deletion of an observation from memory causes the individual to exist in a different version of the quasi-classical world, a different "sector of the multiverse" (2008). In other words, this is a parallel version of physical reality, one in which the observed events did not take place. He gives the case where an

individual observes a planet-destroying asteroid inbound, but then deletes the observation, and thus exists in a different version of the world, one in which such imminent catastrophe is of ordinary, very low probability.

Such specific memory erasure is not possible in the human neural system with its holistic and redundant nature, but a related phenomenon is at work. Expectations give rise to confirmation bias (Lord et al., 1979) resulting in observations being filtered and edited before being added to the record of observations. In the many-worlds reality, with the determinacy defined solely by the record of observations, this means the individual becomes defined as existing in a different version of the world than would have been the case if the observation had not been modified.<sup>1</sup> In other words, bias on observations results in bias on the trajectory of the time evolution of the quantum state of the effective physical environment of the individual. Bizarrely, as a result of the bias, the individual lives in a version of the world where the biased observation represents the events of the decoherent history of this physical world. The trajectory of the frame of reference of the individual, in the quantum concept of time described in Part 2, is altered.

Since the bias is induced to fulfil expectation, and the observation is modified to give confirmation, this version of the world is one in which some kind of confirmation of the expectation has just been given. As a result, given the Bayesian definition of the many-worlds reality, as described in Part 1, the expectations are more likely to be experienced as being fulfilled in the future. Expectation is also reinforced, increasing the likelihood of further confirmation bias. Thus expectations act as strange attractors in the system. The probabilistic destiny is altered.

### 3 Solid State

This phenomenon is of course deeply at odds with our natural intuitions about the world in the current paradigm. The essential point is that in terms of logical type the system is isomorphic to a solid-state computer system, where a sequence of addresses in memory is accessed by altering the memory-address pointer. In the quantum concept of time, each instant is the view of a specific snapshot, a specific point in Hilbert space. Correlations are of the logical type of pointers, or references, to a structure of data in information technology.

The alteration of the 'pointer' defined by the record of observations, i.e. correlations, results in a different point in Hilbert space being addressed, one at which a different quantum state of the effective physical environment is defined, i.e. a different snapshot.<sup>2</sup> As a result, the frame of reference passes from one snapshot to the next. This is experienced as the events of a specific instant happening. The analogy clarifies

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1 Naturally, discovery of having made a mistake is also a future possibility.

2 This is the universal multi-choice DVD of snapshots defined in Hilbert space mentioned in Part 2.

the logical types ideally. The address pointer is of the logical type of the class of all addresses, and the system of which the movement of the pointer is a property is of the logical type of the class of all pointers.

In an information technology system, the dereferencing operation on the pointer returns the value at the memory address to which it points. Given the experience of the Now is the state of the inside view in each snapshot, the experiencing of the snapshot may be considered in logical terms as the experience of the dereferencing operation that returns the state of the inside view defined by a specific snapshot: the view of a specific instant, at a specific point in Hilbert space.<sup>3</sup>

The net result is therefore logically analogous to information processing in a solid state system, but the result is the effective updating of the determinacy of the effective physical environment of the individual, such that the observed events are determinately the case. The definition of each snapshot is of course physical, but the interconnecting dynamics that links one snapshot to the next is an information process: that is what is experienced. The information process is operated as the moving frame of reference passes from one snapshot to the next, thus enacting the computation of the next state of the world hologram, effectively adding the observation to the record. The result is a *real physical world, that works like a virtual reality*.

This explains how a physically impossible dynamics operates in a real physical world. The definition of the world is the physical definition, but the change of the physical world is the iteration of already-existent states, simply a change of the frame of reference. It is logically identical to a movie or a virtual reality running on a solid state system.

The system that operates the collapse dynamics is analogous to a universal DVD in which all possible frames, the snapshots, are defined. The transition from one snapshot to the next is defined by the change required to produce the next one, a process logically identical to the inter-frame compression of ordinary movies. In the effective change of frame of reference from one snapshot to the next, the change is the addition of a new observation. In Everett's terms this effectively changes the physical state of the system because this is the addition of a new correlation with the physical environment. This is effected by, and only by, the moving frame of reference.

In this context, modification of the critical data in the system will inevitably alter the unfolding dynamic pathway of the collapse dynamics. Not, however, by changing anything in the objective physical world: the physical reality does not change. What is changed is which path the moving frame of reference is likely to take through the branching possibilities of the space of all possible worlds. In this type of system, alteration of the observation alters the transition that results in the next snapshot.

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<sup>3</sup> The analogy for time-evolution in relativity is similar. Each moment is specific point in space-time, subjectively the fleeting three-dimensional image in space. Movement of the 'pointer' defined by the inertial frame of reference results in movement of the view along the world-line. Here, however, a better metaphor is an analog computer process where the function is operated in a smooth linear manner rather than incrementally.

The vital learning is that the individual is not entirely irrelevant to which version of events is likely to be experienced as taking place in the world at large, in the physical reality of the world superposition of this individual. The expectations held are strange attractors, constantly directing the trajectory of the individual world in the quantum concept of time. Beliefs and expectations are significant in a manner hitherto unbelievable. In becoming aware of this deep invisible tendency, a degree of influence is effectively possible in the personal world. By visualising objectives and desired outcomes, expectations are induced.<sup>4</sup> In consequence new strange attractors are produced in the world of the inside view.

A number of modern myths about being able to arrive in a desired version of the world, involving events one could not possibly have induced by ordinary means, are potentially given credence. Equally, strong attention to negative, potential, world scenarios is revealed as deeply counterproductive. Contemplating worst-case outcomes is liable to generate strange attractors that would result in such outcomes being more likely to be encountered in reality. Since worrying about negative futures is a powerful trait in standard human psychology, awareness of this principle can lead to better experiences in life through changing mental habituation.

In this context, one would also expect to see a phenomenon in operation which would enact the principle known as karma. The observations of the actions the individual performs tend to become increasingly powerful unconscious expectations, generating strange attractors, and thus leading toward versions of the world in which actions of this nature are increasingly likely to be encountered. No mysterious agencies are involved. It is just that in effect, in the personal world, expectations, conscious or otherwise, produce strange attractors that bias the version of events likely to be encountered.

## 4 Consciousness Continues

As shown in Part 1, the solution of the great paradoxes of quantum theory lies in the second-logical-type phenomenon of world superposition. In Part 2 it is shown that the paradoxical phenomena of special relativity, the passage of time and the Now, are simply explained by a universal, third-logical-type phenomenon, the moving frame of reference. If the existing knowledge is taken at face value this solution is retrodicted.

All three major competing interpretations of time, presentism, eternalism, clearly have validity. These have been considered as competing views, but given the moving frame of reference all three are simply different views of the same relativistic system.

Clearly, the experiencing consciousness supervenes on the moving frame of reference. This explains the nature of Weyl's simple solution to the paradoxes:

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<sup>4</sup> As has been confirmed in medical research, "... positive verbal suggestion and imagery successfully induced positive expectations" (Peerdeman et al, 2015).

The objective world simply is, it does not *happen*. Only to the gaze of my consciousness, crawling up the life-line of my body, does the world fleetingly come to life. (1949, p. 116)

Such concepts are routinely dismissed out of hand because consciousness is taken to be very obviously a property of the brain. However, as shown in Part 2, there is strong evidence for taking the experiencing, the 'phenomenal consciousness', as the subjective attribute of the third-logical-type phenomenon of the universe: this uniquely resolves the paradoxes of the passage of time, and the present moment, dubbed the Now by Einstein (Carnap, 1963, p. 37).

This understanding has a tremendously significant implication. Given that this consciousness is a property of the unitary system, the individual is effectively immortal. As stated by Moravec, quoted above, in the universe of all possible worlds there is inevitably a version of the world in which there is a logical continuation of the individual's experience of reality. So the experience of death in this world leads straight on to the experience of life in the next world. It is a nice idea, but in the absence of an explanatory principle for *continuity* in consciousness it seems tenuous. Just because worlds exist in which the experience of the individual is duplicated, it seems a major leap to imagine that one of these will actually be experienced after death. Why should the experience of a different world follow on from the last experience in this one, however similar the experiences might be? However, given that the experiencing consciousness is a property of the universe, contextual to physical reality, this follows automatically.

Applying Moravec's dictum to the world of Weyl's statement, continuity is automatically produced. As the gaze of consciousness arrives at the end of life-line of the body, it simply passes to another life-line somewhere in the space of all possible worlds, as one new observation is made. The moving frame of reference is to the moments of the life-line as the virtual frame-gate of the hypothetical universal DVD is to the frames of the movie in sequence. When one chapter of the movie ends, the projector seamlessly begins the next one.

The whole conjecture follows logically from applying the concept of the moving frame of reference to the quantum concept of time. As stated by Deutsch (1997, p. 278), it is fundamental to the quantum concept of time that other times are just special cases of other worlds. Technically, therefore, the jump from one snapshot to the next, resulting in the appearance of a small increment in the changing of a specific world, is no different in kind to the jump from one version of the world to a different one in the space of all possible worlds, here the 'Moravec jump'. Thus in experience there is the transition from one life-line to another.

Given the enactment of the quantum concept of time, Moravec's concept must be correct. Given that the progression through snapshots is a real phenomenon, as is constantly experienced, when the only possible next snapshot is in a different worldline, that is what is encountered. The sequence in experience automatically jumps to a different life-line in the space of all possible worlds. Thus, given consciousness of this

nature, death cannot be the end of conscious experiencing. The experience of life always continues. Again, certain principles of traditional religions are supported, but without any dogma.

## 5 Life After Death

The thought experiment makes more sense when arrival in a different worldline is given a feasible explanation. As Deutsch states, we will soon have the technology to make complete, functional human bodies:

Illness and old age are going to be cured soon – certainly within the next few lifetimes ... by creating backups of the states of brains, which could be uploaded into new, blank brains in identical bodies if a person should die. (2011, p. 455)

Whatever happens to our particular version of life on Earth, this must inevitably happen somewhere in the space of all possible worlds. Individuals are 're-sleeved' as portrayed in the Netflix drama *Altered Carbon*. Equally, in an infinite universe, the technology must at some point be used to create completely new people, new bodies complete with minds and characters initialized at random. In this case there is a version of this event in which the record of observations is identical to that of a dying individual in a different worldline. Since the initialisation is random, in the space of all possible worlds there has to be a version of this event that applies for every possible conscious individual.

Naturally, the standard concept of quantum immortality also operates. As described by Standish this is "... quantum physics' dirty little secret" (2006, p. 6). As Tegmark (1997) argues given the many-worlds interpretation this must follow. At any moment where death is a possibility, there is a non-terminal next moment also, defined by the wave function. Since this is all there is to experience, this is what gets experienced. Obviously though, this cannot go on for ever, but another dynamics is waiting in the wings. As survival becomes increasingly improbable, presumably exponentially, a point is reached where the Moravec jump becomes more likely, and in experience a new life begins.

A great myth is elucidated here. The world hologram provides a logical and scientific definition of the soul. The world hologram is effectively continuous not only in the transtemporal sequence of moments in everyday life, but also from one lifetime to the next. In the Moravec jump there is full continuity. As with the transtemporal identity passing from snapshot to snapshot in ordinary life, in the Moravec jump the world hologram is identically the same from snapshot to snapshot apart from one new observation made: otherwise it would not be this individual in the new situation.

Given that the world hologram is the whole individual on the inside view, this is true immortality. As described in Part 1, the world hologram defines and subsumes the



functional identity. It is the sole determinant not only of all of the character, viz. values, beliefs and expectations, but also the algorithms for decisions, and the attributes of programs for rendering this world hologram. Thus the individual who wakes up in the new body is the whole person on the inside view. The immortal soul is simply the world hologram. A longstanding myth with religious overtones is found to have a simple scientific basis, and without any dogma.

## 6 Inherent Morality

In this light there is a powerful inherent morality. If the science is telling us that karma is effectively a real phenomenon, living at the expense of others is directly counter to the individual's own best interests. Clearly, this is hardly supported by observation, there being no shortage of examples of people who do terrible things to others with apparent impunity. In the Moravec jump, however, the whole karma would take effect all at once.

Awareness of this destiny creates a very different concept of the future, producing the kind of sense of responsibility once induced by religions, without any dogma. In the space of all possible worlds, every possible variation of a world in which a dying individual might experience reawakening must exist. In the absence of any other criteria, which world will be experienced must presumably be the one with the most precise fit with the world hologram. Going by Bayesian probabilities, the more the principles and tendencies in a given world match the world hologram of the individual, the more likely that world is to be experienced next at the point of death. This would mean all the tendencies in reality defined by the world hologram, the karma, are expressed in the way this world works, and the kinds of things that are likely to happen to this person. Another great myth has a foundation in an entirely natural and scientific phenomenon. Effectively, going to a heaven or a hell in the next life is based entirely on how the individual treats others in this one, thus generating expectations about how individuals operate.

For better or worse, this demonstrates that there are deep and direct benefits to a humanitarian way of life inherent in the structure of reality. In this light, not to live in accordance with this principle would be self-destructive madness, in the long term if not the short. Enlightened self-interest, as opposed to raw egoism, is the only rational life position. This, however, has none of the connotations of moral absolutism, an objective standard handed down from on high. "Do as you would be done by" is simply the practical approach to generating strange attractors that benefit the individual in every way. The opposite type of action is constantly compromising the tendencies in the world of the individual toward disaster.

In the current paradigm, enlightened self-interest, serving one's own interests by benefiting others, seems to be nothing other than an ideal way to organise a cohesive culture. In the personal, many-worlds reality, however, this is also how to operate a

scientific principle in the holistic maintenance and benefit of the world of this individual. In the context of inside-view physics, this is just karmic health and safety.

On the inside view, life is the potentially endless time-evolution of the holographic field of information defining the world: the soul. In the new paradigm, benevolence is highly affordable because there is all the time in the world. The game of life is a considerably greater in scope than has been appreciated, and this realisation makes a mockery of overly mundane concerns and inconsiderate isolationist pursuits.

## 7 Quantum Mysticism

It may seem deeply suspect that certain of the most enduring mythical concepts of our great traditions are neatly explained as valid scientific principles. However, as Ryle states:

A myth is, of course, not a fairy story. It is the presentation of facts belonging to one category in the idioms appropriate to another. To explode a myth is accordingly not to deny the facts but to re-allocate them. (1949, p. 8)

Ryle was addressing the dualism of mind and body. Nowadays this is readily exploded by allocating the facts about the capabilities of the mind to the computing power of the brain. The original principle behind the myth is however sound. Taking mind to be the world hologram, there is indeed a profound dualism: as Everett describes, the body operates only the linear dynamics while the world hologram operates only the collapse dynamics.

In the same manner certain great myths are naturally exploded. These are phenomena involving different logical types to that of the objective physical world on which our intuitions are based. Interactive destiny operates at the second level of logical type as has been described. Immortality is a function of the third-logical-type phenomenon. These great myths are operational principles of the world of the protagonist, clothed in the idiom of bygone times. As has been demonstrated, these are facts that belong in the category of physics, albeit the physics of the inside view.

The great difficulty is that the myths are generally understood to address imaginary beings and principles, phenomena that clearly have no reality in the physical world. This, however, is the whole point. The physically impossible phenomena are information processes, and operate solely in the context of the second-logical-type level of the system: these phenomena operate only on the inside view, in the physical reality of the world superposition of a specific individual.

The bizarre revelation is that on the inside view these phenomena are not only real but effectively causal. This is a seriously challenging adjustment to the current worldview. The explanatory principle is that the world encountered on the inside view

is of course a real physical world, but it works like a virtual reality, as has been described. The definition of the physical world is the quantum state, but the dynamics in operation are brought about by the effective operation of the information processes in the sequential updating of the inside view.

Granted, it is tempting to dismiss out of hand attempts to find some kind of science in the myths. Dawkins splendidly lampoons dippy oversimplifications:

Quantum mechanics, that brilliantly successful flagship theory of modern science, is deeply mysterious and hard to understand. Eastern mystics have always been deeply mysterious and hard to understand. Therefore, Eastern mystics must have been talking about quantum theory all along. (1999)

The statement is peculiarly close to the truth. In retrospect the reason is obvious why the new paradigm, the worldview defined *by* the new physics, is deeply mysterious and hard to understand. It requires the missing lexicon: logical types as ontologically fundamental. Equally, great mystics have always been deeply mysterious and hard to understand because they are addressing attributes of the paradigm that we can now define in terms of the new physics, without *that* lexicon.<sup>5</sup> Once we have both, the logical form is clear: personal, physical, parallel realities: multisolipsism.

## 8 Racial Survival

The new paradigm not only enhances the lives of individuals, but also greatly improves the prospects of the human race as a whole. The global culture is facing a number of self-induced global catastrophic risks, and they are not being well managed. As Holdren states, business as usual is likely racial suicide:

The way I like to put it is that we're driving in a car with bad brakes in a fog and heading for a cliff. We know for sure now that the cliff is out there, we just don't know exactly where it is. Prudence would suggest that we should start putting on the brakes. (Friedman, 2008, p. 160)

A decade later effective efforts have been minimal. A new solution is urgently needed. A cultural norm of enlightened self-interest would solve the problem, and may well be the only viable solution. As stated by King we have to evolve beyond the natural egoism of human nature:

On environmental issues "... the common enemy of humanity is man". ... Any durable solution to his external and internal problems can only come from evolution beyond the egoism that motivates every individual. The wisdom we desperately require can only come through inner transforma-

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<sup>5</sup> The Gnostics did have the three logical types: Tertullian's (West, 2009) doctrine of three fundamental natures, matter, soul and spirit, i.e. consciousness.

tion. (2006, p. 22)

Clearly a degree of egoism has been an essential component in the historic success of the human species, but it has been balanced by the strong sense of community fundamental to human psychology. However, the atomisation of the culture, along with the ever-increasing reach of single individuals with no countervailing control, or even effective feedback, has led humanity to race toward the cliff edge in a number of fields. Thus the potential for self-induced cataclysmic events is constantly being escalated.

To date it has seemed there was no solution to the untrammelled egoism unleashed in the modern world. As King goes on to say:

All religions have, in their purest aspirations, attempted to induce such a change, with very little success. (ibid)

Sadly modern science has no greater success, even when the required change is clear. As Speth states:

I used to think that top environmental problems were biodiversity loss, ecosystem collapse and climate change. I thought that thirty years of good science could address these problems. I was wrong. The top environmental problems are selfishness, greed and apathy, and to deal with these we need a cultural and spiritual transformation. And we scientists don't know how to do that. (2016)

This is egoism in practice. This is what it looks like in behavioural terms. In other words, egoism is wrecking the planet and driving the human race over a cliff of self-destruction all too literally: the cliff edge of sustainability of the ecosphere.

Adoption of the new paradigm, however, provides the new perspective that otherwise seems so far-fetched. As an immortal entity, and effectively causal in the way reality goes, both without the option, enlightened self-interest is the only sane approach to life. This is exactly the kind of transformation King is talking about. This is the moral code that has been encouraged by religions, but without any dogma. This provides the moral foundation of human culture that has clearly been largely abandoned in the running of the modern world.

In effect human nature is transformed. In fact human individuals are still egoistic, but the egoism operates on a far wider agenda: the known world. Logically, this sways decision-making away from the most injurious outcomes. In due course the further development of the identity becomes available, identification with the known world. Here again a modern description is accidentally discovered for a longstanding practice, the path laid down by the great spiritual leaders throughout history.

Taken up as cultural norm this revitalises the human race. The general outlook is quite different, while the organisations of practical living and the methodologies of the modern world, remain much the same.

This offers an evolution of human nature that will ensure a new racial intelligence. A new age of humankind is born, and it has a very much greater chance of survival. Whitmire argues from a statistical basis that:

... the typical technological species becomes extinct soon after attaining a modern technology and that this event results in the extinction of the planet's global biosphere. (2017)

Certainly the elements of such self-destruction are clear to see in the local instance. The seeds of various kinds of self-induced Armageddon are all too evident. Judging by human history, the good of the collective inevitably takes second place to the drives of egoism as civilisation becomes atomised, leading to ever-increasing global catastrophic risks as advanced technology takes off. It would seem that the new paradigm is a unique key to the survival of the human race. To win the galactic jackpot, the extraordinary necessity of enlightened self-interest needs to be generally understood as the only rational basis for a truly successful life.

## 9 Conclusion

As has been described in the three parts, the missing piece of the puzzle that has made quantum theory completely impossible to understand is the nature of the protagonist. As defined in Everett, albeit obscurely, this is not the physical observer but the state of the memory, defined as the record of observations. In human observers this takes the form of a three-dimensional field of information, here the world hologram. As this defines the determinacy of the effective physical environment, the protagonist is extraordinarily significant in the physics.

It is for this reason that the effective physical environment encountered is not the same thing as the ordinary, decoherent, quasi-classical world of the current scientific paradigm. While the real world of objective physical reality is of exactly this nature, the world actually encountered by the protagonist is the effective superposition of a great number of such worlds, all those in which it exists: the many-worlds reality. It is in this second-logical-type domain that experiments are performed, giving rise to the apparently paradoxical results because the experimenter is always operating in a world superposition, a class-of-worlds-as-a-world. This fundamental duality is the meaning of the measurement problem.

The key point in this regard is that the experimental field, the physical world of the inside view, is of different logical type to the quasi-classical world of the current paradigm. The phenomena that cannot possibly operate in the ordinary quasi-classical world defined by the linear dynamics are naturally enacted, effectively, as each observation is made. Effectively, on the inside view, the collapse dynamics is enacted as the definition of the class-of-worlds-as-a-world changes. This is the basis of inside-view physics.

Given the nature of this domain, a number of other phenomena, physically impossible on the outside view, also operate at this level of logical type. The world hologram is the soul, meaning that life effectively continues on from lifetime to lifetime, as told by Moravec. Hell and heaven are simply the categories of world in which the individual may arrive, as the result of egoism or enlightened self-interest respectively: effectively evil and good. There is an inherent morality, a right and wrong completely defined by the effect an action would have if the protagonist were in the recipient's position, the karma, all without any dogma. This means that some of our most powerful and cohesive intuitions about the world, and how to treat each other, are in fact fundamental principles of the domain one inhabits.

Given the exact logical form of these concepts in the dynamics of the physics, it is clear this is not in any sense going backward to irrational superstition but forward to fully understand the operational principles of the universe on the inside view: inside-view physics in operation. Completing the meaning of the new science to discover the same themes as the great myths is simply confirmation that natural science has been on the right track a very long time. This just means that the operational principles were deduced through logical analysis and intuition long before the explanatory principles were discovered in the new physics revealed by the now-familiar advanced-technology experiments that were required.

The great benefit of the new paradigm is that it provides an effective counter to the culturally destructive imperatives of egoism, ever more unleashed from all the historic constraints of community. If Whitmire is correct, and the human race is alone in the galaxy because advanced civilisations inevitably destroy their ecosphere, this would appear to be the one and only possible avenue to survival. As King describes, the only durable solution to the ever-perpetuating crises of humanity is the evolution beyond the egoism that motivates every individual. The new paradigm revealed by the full implications of the new physics has the potential to achieve exactly this result. Moreover, this returns principles central to humanity to full rationality.

The full meaning is indeed a conceptual revolution. We are beings of eternity, and we live in worlds of inherent morality. We are on our own. We are responsible, and we are empowered. No wonder classic hero myths echo the new paradigm. There is ontological truth in the saying 'know your self and the truth will set you free'. This is the prize of the new enlightenment. This understanding, it is proposed, will heal the human culture because it transforms the ego. It means that enlightened self-interest is the real self-interest because the universe is a multisolipsism, and you are the world.

The central component of the conceptual revolution is the full meaning of the nature of the individual. The implications are crucial. As stated by von Baeyer:

The deep confusion about the meaning of quantum theory will continue to add fuel to the perception that the deep things it is so urgently trying to tell us about our world are irrelevant to everyday life and too weird to matter. (2013, p. 47)

As has been shown, such perceptions are utterly false. These things certainly seem very weird, but they could not be more relevant. This is a manifesto for taking the new physics at face value, despite this flying in the face of central principles of general acceptance, and despite the implications forming precise explanations of certain major mythical principles. These myths are classical depictions of natural phenomena completely in accord with the new physics, and recognition can only assist in resolving the deep cultural problems in which the human world is mired. May we dare to know.

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