The Quantum Mechanical Frame of Reference

Part 3: The Spirit of Physics

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Abstract: Despite the simplicity of Weyl's solution to the paradox of the passage of time in the static block universe, virtually no interest is shown in this approach although as shown in Part 2, the problem of the Now could be taken as evidence for his solution being correct. A moving frame of reference is required to explain the experience of the enactment of any of the dynamics of physics, and the experiencing consciousness supervenes on this phenomenon. Given the logic involved is straightforward, it seems that the reasons all this has been ignored may be less so. Here it is suggested, based on Davies' (2006) research, that this might well involve a horror of even the possibility of deity and mysticism being dignified by discussion, let alone endorsement. The objective here is to demonstrate that this approach does validate certain archetypal myths of the great spiritual traditions, but at the same time fully supports and reinforces the objective basis of the science of physics. The myths are exploded to reveal simply scientific principles, and a complete absence of gods or mystical phenomena, indeed such things are categorically ruled out. The scientific principles illustrated by the third logical type which have languished unexamined turn out to be powerful knowledge which serves only to reinforce and emphasise how deeply flawed were the key principles of the religious preoccupations which our culture had to relinquish in order to move forward.

1 Logical Types in the Great Myth

The spirit of physics could be said to be objectivity. It is the science of the ground of being; and the fact that we have been able to discover the fundamental rules of operation of the reality in which we find ourselves is greatly treasured. This may be one reason why the idea of consciousness being anything other than a neurological epiphenomenon is greeted with such distaste and even on occasions overt expressions of strong negative emotions. As Burkeman writes from outside the field:

> Questions like these, which straddle the border between science and philosophy, make some experts openly angry. (2015)

However, the physics we have discovered does not end with the ground of being, the vast enormity of existence, despite the absolutist objective stance taken by some. This is static; and it is totally obvious that something is happening in the world. As described in Part 2, a moving frame of reference is required: the third-logical-type phenomenon of the universe is retrodicted. This is what breathes life into the equations, to answer Hawking's famous question; and consciousness supervenes on it. It is thus spirit in the most literal sense.

As shown in Part 2, three levels of logical type are clearly required to explain the new physics and complete it. For the dynamics to be enacted in any way in a static domain, the frame of reference must move through the domain, and must therefore be a third-logical-type phenomenon. One can well imagine that the inclusion of an abstract omnipresent operational principle is far too close for comfort to concepts of deity for many. As Davies (2006, p. 16) states, a great many scientists consider belief in God to be a not only infantile, but highly dangerous delusion, and are committed to getting rid of such ideas from the world. For those of us in this position, even to discuss consciousness in this light could well be considered the thin end of a wedge that might lead to gross compromise of the science which has led us out of the dark ages of ignorance and superstition. Going by the literature, there is clearly a very large number of people passionately seeking to demonstrate some kind of connection between physics and deity, so those opposed to such notions may well be equally strongly opposed to any opening of doors to discussions that could weaken the freedom of science from religion so hard won at the outset.

Analysis of the symbology of the Christian Holy Trinity easily puts to rest any concerns that allowing the possibility that consciousness is both non-physical and an operational attribute of the universe would open the flood gates of irrational theism. The deep meaning is all science. To consider that the totality of the universe is something greater than ourselves is hardly unscientific. This is the unitary system of which everything is a part. To call this God the Father is in and of itself harmless. Such a title is essentially misleading, however, as this is *not* a person. It is the static and timeless totality of the entirety of existence. As Bishop John Spong states in *Why*

Christianity Must Change or Die (although the use of the masculine pronoun is rather out of place):

> God is not a being superior to all other beings. He is the Ground of Being itself. (1998, p. 70)

It does not, cannot, have an active interest in human affairs. Even if it were conceivable that you could ask this entity for an opinion, the answer, by definition, would be all possible answers. It is not an entity that any kind of human characteristics can be meaningfully applied to. In logical terms its nature is elementary and straightforward. It provides the first, primitive logical type: every possible moment, laid out in the space of all possible worlds. It is fundamental. It is static. It just is.

As demonstrated in Part 2, it is the third-logical-type phenomenon, the moving frame of reference, that breathes life into the equations. Consciousness supervenes on this phenomenon. Thus, as stated by Weyl (1949), it is as consciousness moves along the worldline of the body-mind that the world fleetingly comes to life. This is poetically addressed in a most unmistakeable way by the concept of God the Holy Spirit. Firstly, it is literally the spirit of the whole: that attribute of the whole that animates and brings to life, by iterating the moments. Clearly, this is not a person either. It has no character. Just as full spectrum light carries no information, which is acquired as it is reflected, so too consciousness has no personality. As stated by Bitbol, referring to the third-logical-type phenomenon as Mind: “Mind is by itself point-of-viewless just as it is placeless and timeless.” (1990, p. 8). Secondly, therefore, it is literally the Holy Ghost, the ghost of the whole: that property of the whole utterly present but invisible and intangible, as if not really there. It is the experiencer of the experienced; and all properties of definition are properties of the experienced.

In the experiencing of the first logical type components of physical reality by the third-logical-type phenomenon we know as consciousness, the system is brought to life. This is the second-logical-type phenomenon we know as transtemporal reality: the events, at moments along the worldline, experienced in sequence in the moving frame of reference. This is the dynamics of the four-dimensional space-time matter and energy movie defined by quantum mechanics, as described in Part 2. Each transtemporal reality is an Everettian world, an inside view, an 'in here', brought into existence by the interaction of the 'Spirit' with the 'Father'. This, of course, *is* a person. This is the nature of each conscious individual, as described in Part 2. In the mythical structure this corresponds to the Son, the child process thus brought into ongoing transtemporal being. As described in Part 2, this is an information process. The process is the person, and the experiencer that supervenes on the moving frame of reference is the 'I' or Self.

In the myth, God the Son is a role, a special idealised person, but in the science the principle is of course generic. Every individual, male or female, human or not, is a child of the system, a product of the situation. Each is an inside view, a phenomenon of the second logical type, the ongoing sequence of moments, an instance of the four-dimensional space-time matter and energy movie of life in action. Thus the Holy

Trinity is none other than the trinity of fundamental logical types, represented in mythical form as real people, three persons in one god, making up the whole of the dynamical universe in which transtemporal processes arise.

Jesus quotes the Old Testament saying: “Ye are gods; and all of you are children of the most High.” (Psalm 82:6; King James Bible (Cambridge Ed.)). Taking the most High as the ground of being, of which the third-logical-type phenomenon is a fundamental property, this is a fully modern idiom.

2 Immortality

Though entirely mundane, the individual in Everett's no-collapse universe is somewhat godlike in comparison with the usual concept of a person. Other principles common to major spiritual traditions have a full explanation in the new physics; the first is immortality. As stated by Moravec, when we die:

> We lose our ties to physical reality, but, in the space of all possible worlds, that cannot be the end. Our consciousness continues to exist in some of those, and we will always find ourselves in worlds where we exist and never in ones where we don't. (1998)

In other words, given the universe of all possible worlds, there is inevitably a version of the world in which there is a logical continuation of one'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 it seems tenuous. Just because worlds in which we exist are present in the system, it seems a major leap to imagine that one actually goes on to one at the moment of death. Why should that happen? However, given consciousness as the subjective attribute of the third-logical-type phenomenon of the universe, it is as inevitable as he states.

The mechanism of observation is enacted on the inside view as the frame of reference passes from one instant to another. Whatever the last observation made by the individual dying in one worldline, it must necessarily match the first observation of a newly created being in some possible world. The thought experiment is easier with a practical example. 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. In some of these worlds, the technology will be used to create completely new people, new bodies complete with

minds and characters. As the body is first animated, the first observation will be made. In the space of all possible worlds, there must be versions of this event in which the observation is identical to that made by a dying individual in a different worldline.

Naturally, in order for this to constitute the reincarnation of the dying individual, the world hologram of the new body would also need to be identical to that of this individual. Whatever the mechanism whereby this might happen, the probability must be very small indeed. However, this does not affect the outcome on the inside view. In the space of all possible worlds, every possible variation of such a situation must occur. Therefore, at the point of death, the next observation made is inevitably that of waking in a new body, with the same world hologram, somewhere in the space of all possible worlds.[1]

This provides a practical 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. Moreover, as described in Part 2, it defines and subsumes the functional identity. It defines not only all the determinants of character such as values, beliefs and expectations, but also the algorithms for decisions and the attributes of programs for rendering this world hologram. Thus the individual waking up in the new body is the whole person on the inside view. Again, the apparently mysterious and possibly religious overtones of a longstanding myth are exploded to reveal a simple, logical, scientific basis. It is weird, possibly so weird as to seem unbelievable, but that is only because we are used to the thinking the opposite.

3 Interactive Destiny

These bizarre perspectives arise from the resolution of the static block universe in relativity. The experience of the passage of time, and the phenomenon of the Now, can only be explained by the moving frame of reference, which confirms Moravec's principle. Other properties of the third-logical-type frame of reference come to the fore in quantum theory. As described in Part 2, the world of QBism has a quantum mechanical foundation in the no-collapse universe, being the effective superposition of all the quasi-classical worlds in which the world hologram is instantiated. In this kind of personal world, the measurement problem is dissolved, and there is no difficulty with the collapse of the state vector taking place, in effect, as the moving frame of reference passes from one snapshot of the world to another. This is the result of the information process at the second level of logical type, the dynamics of the inside view. This is the enactment of the quantum concept of time on the inside view: the addition of each new observation to the record is what defines the time evolution of the quantum mechanical frame of reference.

1 This of course provides a very much more comprehensive concept of immortality than the standard idea of quantum immortality.

Each such snapshot is defined by the quantum mechanical frame of reference, the effective superposition of the quantum states of the quasi-classical worlds in which the world hologram is instantiated. In this context, another bizarre phenomenon would be expected to manifest. Just as the making of an observation is concomitant with the redefinition of the individual, as existing in a different snapshot on the quantum concept of time, the deletion of that observation would result in reversal of the process. This is demonstrated by Mitra (2008). This specific memory erasure is not possible in the human neural system with its holistic and redundant nature. However, a related phenomenon is at work. Expectations give rise to confirmation bias, resulting in observations being filtered and edited before being added to the record of observations. In the kind of personal world defined by QBism, the centred world of Everett taken at face value, this means the individual becomes defined as existing in a different snapshot than would have been the case if the observation had not been modified. In other words, in a physical world of this nature, bias on observations results in bias on the trajectory of the time evolution of the quantum state of the world of the inside view, the quantum mechanical frame of reference.

As a result of the bias, the individual lives in a version of the world where the biased observation represents the events of the relativistic past of this physical environment. As stated by Mitra, alteration to the record of observations results in the individual existing in a different sector of the multiverse. 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. Thus the expectations are in general more likely to be experienced as being fulfilled in the future.

The phenomenon is atrociously at odds with the natural intuitions about the world in the current scientific worldview. This is where it is crucial to note that the inside view is an information system, and the collapse dynamics in operation is an information process. In this light it could hardly be otherwise: modification of the critical data in an information system can hardly fail to result in alteration of its unfolding dynamic pathway.

As described in Part 2, on the inside view the information is in effect causal on the physical. Naturally, on the outside view the opposite is the case. On the inside view, deletion of a crucial observation could produce very dramatic alterations as described by Mitra. He gives the case where an individual deletes the observation of a planet-destroying asteroid, and is thus in a different version of a quasi-classical world, one in which this imminent catastrophe is of ordinary, very low probability. The destiny of the worldline is drastically altered on the inside view. Death aside, dramatic outcomes for confirmation bias seem highly unlikely. However, the bias would tend to set up self-reinforcing processes in the inside-view system. On this basis one would expect to see the effect of strange attractors in the system, as described in the Appendix.

In this context, one would also expect to see a phenomenon in operation which would enact the principle known as karma. The world hologram is naturally a record of

the actions performed by the individual along with everything else, and form fundamental data about what happens in reality. The more these kinds of occurrences are observed at close hand, the more they become increasingly powerful unconscious expectations. In this case, confirmation bias would operate, and thus the individual is increasingly likely to experience these kinds of events happening, as observations are biased and strange attractors are set up. Inevitably therefore, eventually, these kinds of events are likely to happen to this individual. Effectively, karma operates. Again, no deities or mysterious agencies are involved. It is just that in effect, in a personal world, one is constantly defining which versions of the world one is likely to experience in the future. Not by changing anything in the objective physical world, but by biasing which path the moving frame of reference takes through the infinite possibilities of the no-collapse universe.

4 Inherent Morality

Unsurprisingly, there are powerful implications to be drawn from all this. The first is an inherent morality. If the science is telling us that karma is a real phenomenon, living at the expense of others is directly counter to one's own best interests. So there are direct benefits to an altruistic way of life inherent in the structure of reality. Enlightened self-interest, meaning acting to the benefit of others in order to serve one's own self-interest, is the rational life choice. Here, therefore, we have a further principle of the great spiritual traditions borne out by the science; but of course this 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, rather than deeply compromising the tendencies in the personal system.

This inherent morality even leads on to a practical meaning for the terms heaven and hell. It seems highly irrational to believe that the way of life one follows could be terribly significant. There is no shortage of examples of people who do terrible things to others with apparent impunity. However, in the transition from one lifetime to the next all of the karma takes effect all at once. In the space of all possible worlds, every possible variation of a world the individual might arrive in must exist. The more similar the principles and tendencies in a given world are to the world hologram of the individual, the more likely that world is to be experienced next at the point of death. This would mean that the version of the world encountered next would likely be the one with most precise fit with the world hologram; and this means that all the tendencies in reality defined by the world hologram, the karma, will be expressed in the way this world works, and the kinds of things that are likely to happen. Clearly, given the variation present in all possible worlds, it could be a heaven or a hell; and it appears that the selection would be based solely on the record of observations. In this case, karma is clearly more than just a force to be reckoned with. Not to live in accordance with this principle is self-destructive madness in the long term.

Again, this is not to do with any external judgement by a super-being but simply the cumulative effect of observations. As has long been held in Buddhism, only the natural laws of causation are required to explain the effects of karma.

5 Gods

Given the extraordinary relevance of the individual, and the influence being exercised in the reality, it seems the spectre of godlike powers might be rearing its head again. However, it is clear that there can be no gods of the Greek, Roman or Pagan type either. There are no super-powerful beings of human or any other physical form. Any specific entity in the universe lives in a domain determinate solely where observed, a purely personal physical reality. No entity can be in any way causal on another, except by straightforward physical interaction. There can be no God in any traditional sense. While the individual is significantly at cause in their own idiosyncratic reality, they can have absolutely no effect or jurisdiction in the realities of others. We may be gods of a kind in our own realities and in our own lunchtimes, but with respect to others there can never be anything but arms-length, networked connections. We are on our own; and Harry Potter magic is a completely empty fantasy.

Individuals are very much more significant than can be explained on the ordinary, objective outside-view concept of the world. On the inside view the reason is simple and natural. As shown in Part 2, to all intents and purposes the individual is the same thing as the personal world. One is the world hologram and the information process and the experiencer. This is what constitutes the conscious individual. The implication is, as the modern sage Krishnamurti puts it:

> You and the world are not two different entities. You 'are' the world, not as an ideal, but actually. (Lutyens, 1983, p. 74)

Again, there is nothing mysterious about this. It is simply the result of the physics of QBism, supported by the well-established physics of Everett's formulation.

On all counts it seems the potential for the delusion of a super-powerful being with a child-level psychology taking hold in science is diminished if not eliminated. There is one further powerful explanatory principle which serves to undermine such tendencies. Dogma is shown to be inherently false, by definition. Dogma is defined as a statement about the facts of reality that has no evidence in reality. But in the personal world of any given individual, only that which has been observed is determinate; and everything else is to some degree indeterminate. By definition, dogma is not backed by any observations. So, whether a specific dogma is true or not, is not just uncertain; it is indeterminate. In other words, it is simply *wrong* to say it is definitely true. Ironically therefore, the claim that a dogma is definitely true defines it as false.

6 Conclusion

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. The things the science is trying to tell us are certainly very weird to us, but they could not be more relevant. As shown in QBism the physical world is deeply personal; and in this kind of world the archetypal principles of the great spiritual traditions are borne out in reality. We now have the science to put all this into practical terms, and information technology makes us familiar with how information systems, i.e. second-logical-type systems, operate and can be understood.

Natural science is nothing new. Given the precision of their fit, it seems these metaphors where not just lucky guesses but the work of sages, superb intuitive analytic thinkers who derived the operational principles a priori: logical types, forming a hierarchy of ontological categories with their archetypal dynamics. They wrote how-to manuals, which subsequently suffered Chinese whispers over a great many transcriptions. The most important message of all is holographic, permeating the messages, and thus survives. The great calling of spirituality is not to discover god out there, or in here, but acceptance of nature. We are on our own. We are responsible; and we are empowered. We are triune beings of eternity, in worlds of inherent morality and karma. Clearly, avoidance of the deeper implications of the new physics has not led us to a better world: the human culture is increasingly rabid. It seems likely that accepting them may well help humanity to develop in a far more positive manner.

Appendix

Because of the effect of confirmation bias, expectations tend to act as strange attractors in that the system tends to gravitate towards expectations being fulfilled. Expectation gives rise to biased observations; and each biased observation defines the outcome of the expectation as more likely than before.

When a biased observation is made, consciousness passes to a different version of reality than would otherwise have been the case, had the observation not been biased and altered. In other words, in effect, because the process of observation is biased, the outcome of the collapse dynamics is biased. The biased observation represents a more favourable version of reality, one more in accord with expectations; and this becomes

the definition of reality as the biased observation is made. This is a direct consequence of the personal world defined in QBism: the record of observations is the sole definition of the determinacy of the real world of the individual. Thus if observations are biased before being experienced, the probabilities defining which version of events are likely to be experienced in the future are biased also.

As a result of the biased observation, one is defined as existing in a version of reality in which the expectations causing the bias are more likely to be fulfilled. The effect of the filtering and modification of observations on the inside view, due to expectations, is to progressively alter the version of the world in which the individual is defined as existing, toward a version in which the expectation is fulfilled. In other words, expectations act as strange attractors in reality.

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