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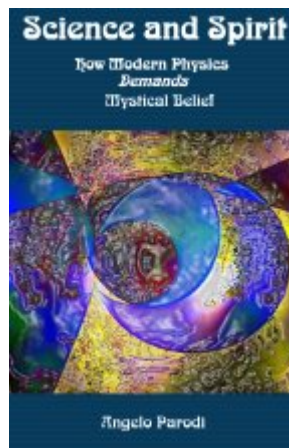
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Science And Spirit



By Angelo Parodi

Our Perception of Time

Our awareness of time might be likened to the sweeping beam of a lighthouse in a pitch-dark night. We seem to see only a small circle of sea, shore, land rushing by us. The rest of the vista, however, still exists, even though we cannot see it. By far, one of the most profound results Einstein deduced is that time and space are not distinct things, as Newton assumed, but rather, form a single space-time continuum. (Recall that a continuum is something in which, for any two distinct points, regardless of how close together, we can always find a third point that lies between them.) Thus, although it seems as if we have control over our movement in the three spatial dimensions while time flows inexorably by, this is just an illusion. If we could behold the vista of time

the way we survey the expanse of a landscape, we'd perceive that events, in reality, do not unfold before us with the passage of time. Rather, they would present themselves all at once across the field of our vision. It is merely an artifact of our peculiar relationship to this continuum that causes us to witness one narrow strip of visibility as it sweeps across the temporal dimension of the space-time matrix. Each of us, through the movement of this view-port, seems to discover new slices of existence, even though the entirety is already established prior to our awareness of it. Einstein has painted for us a picture of a four-dimensional matrix, which we can, conceptually at least, observe from some external fifth dimension. From this exterior position we would see the events of the past, present, and future in much the same way as we look at a two-dimensional map and see north and south, east and west. The philosophical difficulty with this picture, as thus far presented, is that it smacks of determinism. Without some modification, we are faced with a model in which we are helplessly swept along by a raging torrent of time, like rafters without paddles (free will). If the events of our lives are somehow embedded in the four-dimensional space-time continuum, if they simply are, then how can there ever be such a thing as individual volition? The answer lies in merging this tenet of relativity with Everett's many-world interpretation of quantum mechanics. Since we have already stretched our minds far enough to envision four dimensions, even though our sole material experience has been limited to dealing with three, it shouldn't be too difficult to stretch a little further. If Einstein, Everett, and Bell are correct (and by all indications, they are), then what we actually have is a universe of $(3N + 1)$ dimensions, where N represents the number of degrees of freedom, or decision points in the universe. (We're assuming that there is a single time dimension uniting the multiple spatial possibilities, which is consistent with Everett's mathematical development.) Using our animal-abusing friend Schrödinger as an example, we have two degrees of freedom ($N = 2$), corresponding to the two possibilities: 1. -the cat is alive, or 2. -the cat is dead. Each possibility branches into a three-dimensional universe, so for this example we are dealing with $3 \times 2 + 1$, or 7 dimensions. Obviously, since the actual value of N would correspond to every possible decision point, for each individual (human and otherwise), throughout the entire history of time, the result would be a rather large number. How large? Certainly too large for us to comprehend, but, I would contend, not too big for the mind God (in whatever form we choose to envision The Deity).

Of course, both theologians and scientists often have difficulty aligning intuition with the realities of time. John Polkinghorne (who is both a physicist and a Catholic priest), provides an example that typifies our tenuous grip on temporal issues when he says of God that: "Even He does not know the unformed future ... for that future is not yet there to be known." (John Polkinghorne, *The Faith of a Physicist*, New Jersey, Princeton University Press, p. 81.) As this quote demonstrates, it's all too easy to become hopelessly ensnared by a vision that has God as helpless before the flow of time as we mortals seem to be. Nonetheless, we must understand the Universal Mind to be external to time itself. The physical 'thing' that came into being at the moment of creation included time itself, and hence, concepts of a God constrained by this component of the physical universe are childishly simplistic.

Similarly, if time itself comes into existence at the moment of the Big Bang, then there is manifestly no such thing as what God was doing 'before' the Big Bang. Just as He is that He is, so too can we understand that it is as He would have it be, beginning to end, in a timeless act of perfect creation/will. Considering what we already know of the quantum nature of our local reality, it isn't too great a stretch to envision each instant as an independent, self-supporting 'object' of existence. The only connection of each moment to those preceding and those following is actually an artifact of our conscious motion from one event to the next. (This is a view propounded in Alfred North Whitehead's Process Philosophy.) (Alfred North Whitehead, *Process and Reality*, 1978, New York, The Free Press.) Much like the frames of a motion picture, each quantum instant differs from the next one, and from that which came before, by a small but discrete degree; yet, when shuffled by the thumb of consciousness, the illusion of continuity appears. But whereas each frame of a film has at most one other to either side of it, this 'film' is like a bundle of yarn—squeezed in the center between thumb and finger, squeezed so tightly that the middle is no more than a single thread. Thus, each moment may be reached from a multitude of previous possibilities, and may be followed by a myriad of others.

From this perspective we can see how determinism is avoided, even though we maintain the model of a static, pre-determined universe. Conscious volition—free will—is the mechanism by which we choose our path through the almost endless selection of alternatives.

Time: A Theological Perspective

Thus far, we have based our picture of time as an independent dimension primarily on scientific arguments. It is, however, important to realize that theological reasoning leads to a remarkably similar conclusion. For example, in the fourth century, Augustine examined the paradoxical nature of time in his *Confessions*. Augustine asked of God: "How could they pass by, those countless ages, which you had not [yet] made, although you are the author and creator of all ages?...Or how did they pass by, if they never were?...You made that very time, and no times could pass by before you made those times. But if there was not time before heaven and earth, why do they ask what you did then? There was no 'then,' where there was no time." (Saint Augustine, *The Confessions of St. Augustine*, Translated by John K. Ryan, New York: Bantam Doubleday Dell Publishing Group, Inc., 1960, pp. 286-287.) Clearly, Augustine had a far more accurate vision of God's relation to time than does Polkinghorne. Furthermore, Augustine appears to contemplate the notion of a quantized time, observing that when time can no longer be divided into increasingly minute parts of a moment, that unit alone can be referred to as the 'present'. Later, he wonders at how prophesies of the future could be explained. He examines the concepts of past, present, and future, speculating that when the present emerges from the future, it may well proceed from some "hidden source," and as it recedes into the past, it similarly goes to some other place. From this, he concludes that time is "nothing more than distention." Evidentially, Augustine intuitively understood that time—past, present, and future—exists in a space-like manner.

Like us, he struggled with the overwhelming implications and the difficulty of envisioning such a thing. Since it's obviously troublesome for us to envision so complex a picture, let's simplify our model a bit so we can get a better feel for it.

Cosmic Scrabble—Many Worlds Revisited

We'll use a picture to observe how Everett's many-world interpretation of Quantum Theory might play out in our effort to understand time:

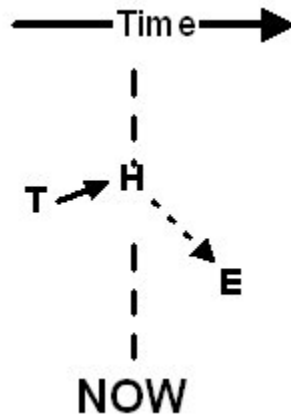


Figure 23

In Figure 23, we are in the middle of writing the word "THE." Let's suppose that the time it takes us to write a single letter represents the smallest granularity into which time can be divided; that is, a quanta of time. In the previous moment, we wrote the letter 'T'. We've just finished writing the letter 'H'. Since our intention is to write the word 'THE', in the next instant we will write the letter 'E'. So far, so good? Of course, we could change our mind, and write the word 'THAT' instead, as shown in Figure 24.

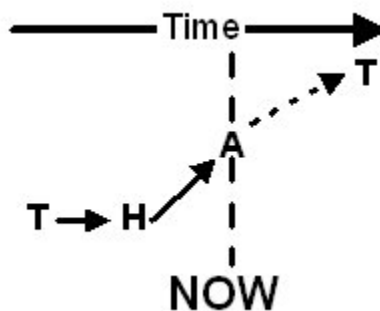


Figure 24

We just wrote the letter 'A', and an instant from now we'll be writing the letter 'T'. Life is sort of like this, right? We get out of bed, plan to have a cup of coffee, then shave, then brush our teeth; but instead we change our mind, have a second cup of coffee, then brush our teeth, and shave last of all.

Nothing earth shattering. Just a little change of plan. Now let's put a 'Many Worlds' spin on this:

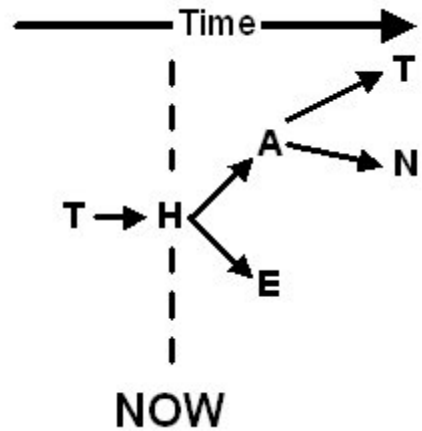


Figure 25

From our omniscient perspective outside of time, we can see (Figure 25) that there are several options open to us—we can write 'THE' or 'THAT' or even 'THAN'. Moreover, all of these eventualities are equally real. Of course, once we make a choice (e.g. Figure 23 or Figure 24), the other alternatives are no longer available. Are the other options still there? Sure, just not for us. Though it might seem as if this represents an awful waste of realities, since only one is actually 'used', we'll consider some possible resolutions of this dilemma later. Of course, words and letters don't exist in isolation, so let's see what the bigger picture might look like:

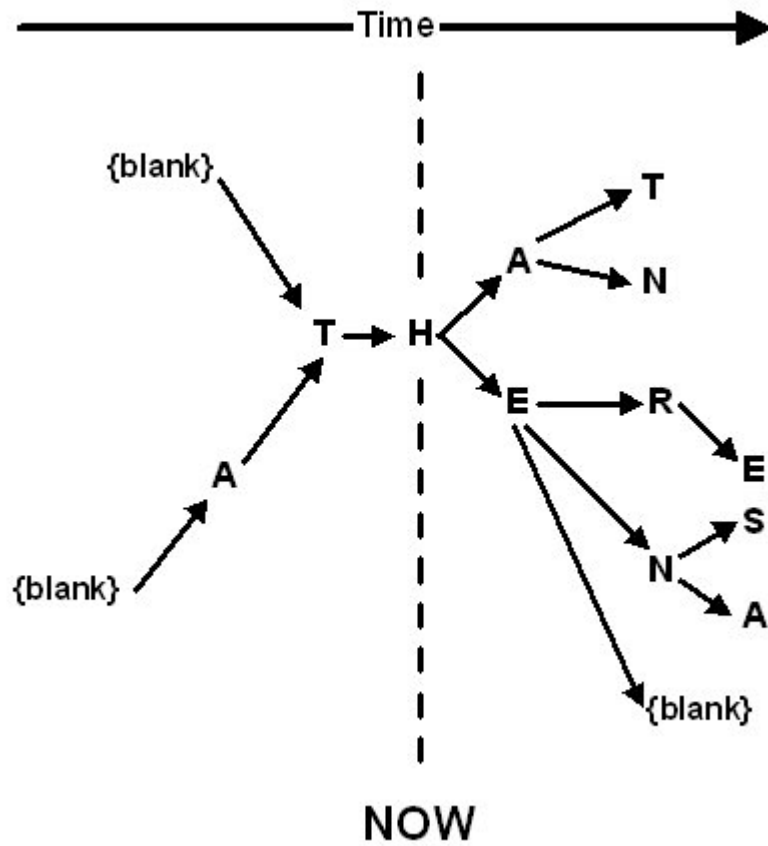


Figure 26

Now things get more interesting. In Figure 26 we see that we might have arrived at the current moment (this particular 'NOW') by a variety of routes. Depending on how we got here, not every choice will result in a sensible word. (Remember, like the game of Scrabble, we are only permitted to spell valid words.)

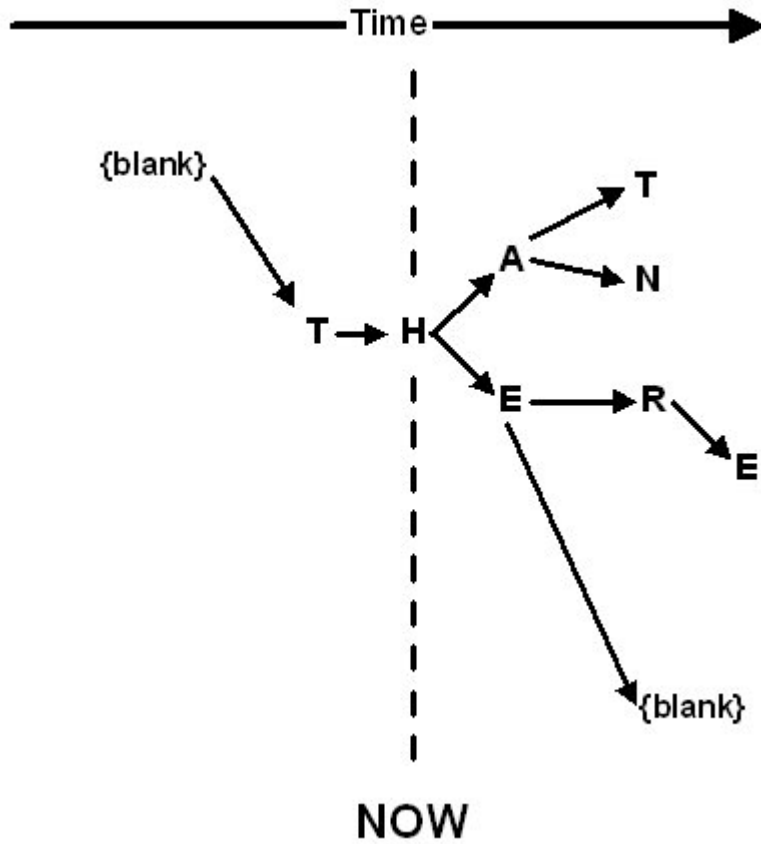


Figure 27

If we have written a blank space before the 'T', then our choices include 'THAT', 'THAN', and 'THERE' (Figure 27).

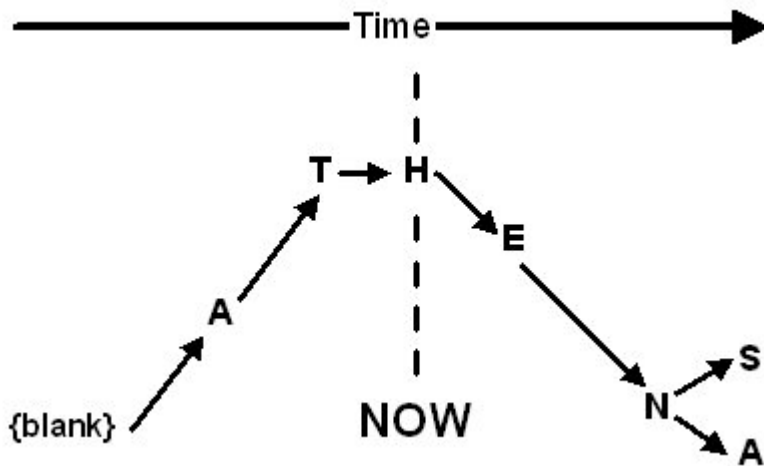


Figure 28

On the other hand, if we've just finished writing {blank}, 'A', 'T', as shown in Figure 28, then our alternatives are different: We can only form the words 'ATHENS', or 'ATHENA'. But wait! Remember how the delayed-choice double-slit experiment proved that, under certain circumstances at least, decisions

made in the present can alter the course of past events? Might we, through an appropriately directed act of will, even change the foundations of the past?

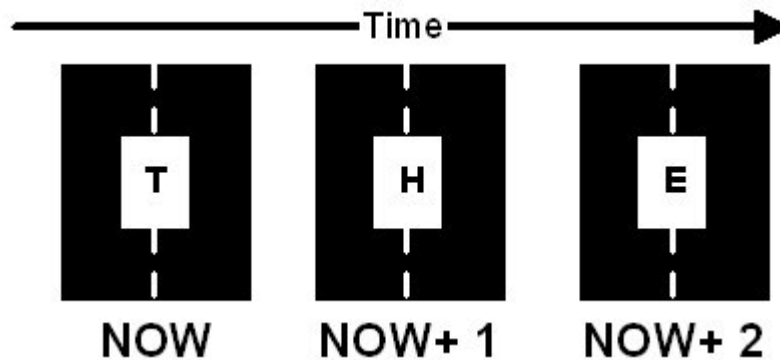


Figure 29

Of course, what we experience is the illusion of events developing over time. We see only a narrow window, which we think of as 'the now'. Imagine a cardboard mask with a hole cut in it, as shown in Figure 29, being slowly swept from left to right. (For the sake of simplicity we're using the case in which the word we're spelling is "THE.") This brings us back to our notion of "new slices of space-time" being revealed to us as successive aspects of the material world. By now you can recognize this as a simplification of the Everett many-worlds interpretation of Quantum Theory and Bell's Theorem. As we noted earlier, it seems kind of wasteful to have all these 'extra worlds' lying around, just in case we happen to need them, doesn't it? Let's continue examining our Cosmic Scrabble 'thought experiment', and see if we can make some kind of plausible sense of it. Let's suppose for a moment that this isn't our private game, but that anyone can play it. (Perhaps it's a program on the internet, and as each player logs on, their own game-state is reloaded for them.) In all likelihood, the next fellow logging on will elect to spell different words than we did. Perhaps we ourselves will choose to play the game again, and next time around we'll spell something else. Now that we've considered the possibility that more than one individual (or spirit) may traverse this particular matrix, each making unique decisions, and thus, following distinct paths, lots of other pieces fall into place. We've even allowed for the possibility that the same person (spirit) might have an opportunity to traverse the same matrix more than once. So what does that buy us? Well, suppose the point of this exercise isn't merely to spell any valid word, but to answer a particular question. For example: "Who was the Greek goddess of wisdom and prudent warfare?" In that case, the only correct path through the matrix is the one shown in Figure 30, which spells: 'ATHENA' (which just happens to be my eldest daughter's name).

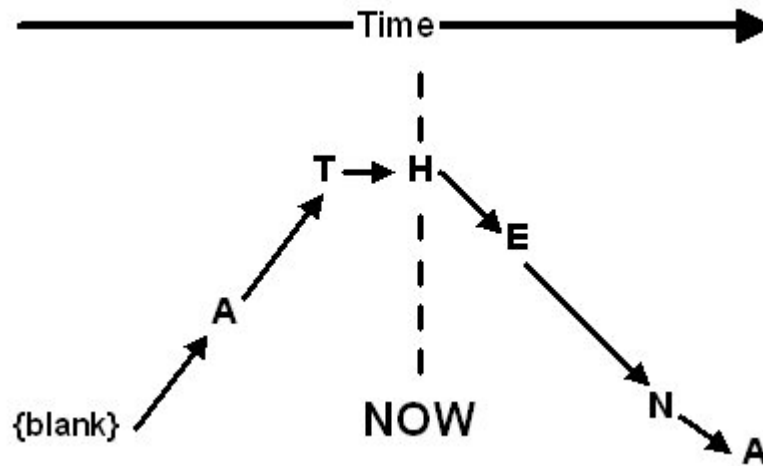


Figure 30

Like a multi-player strategy game, many different players may attempt the same puzzle. Once you begin, however, you must remain at a particular level until you finally solve all of the enigmas. Then you may move on to more challenging levels. Stepping back a bit, we can see how our individual lives, and all of their inherent decision points, are analogous to our simplified scrabble game. The entire matrix of lives is laid out in advance, with, perhaps, one particular path representing the ideal pattern of each existence. The fact that only one set of options is chosen during a particular traversal no longer results in a proliferation of superfluous options. This, of course, introduces the uncomfortable concept that your physical self is not the sole property of one particular spiritual entity. The notion that your body may be capable of being 'used' by more than one spirit takes some getting used to. After all, we're not cognizant of possessing (or being possessed by) more than one personality, are we? Remember, however, that the overall self is a combination of several components: the instincts, the intellect/mind, and the spirit/soul. Each distinct combination of physical intellect and spirit will result in a very different individual. For the most part, these diverse versions of you will exist in different 'world lines'. Of course, there might be situations in which more than one of these entities overlap. Jung (C.G. Jung, *The Basic Writings of C.G. Jung*, New York, Modern Random House, Inc., 1993, p. 56.) observes that our psyches are composed of a plurality of loosely knit components, not a self-contained union, and that it often takes very little to shatter this precarious illusion of a unified consciousness. Who has not had the experience, either momentary or prolonged, in which he or she simply hasn't felt quite 'normal'? Could this, in fact, represent the kind of 'parallel' event in which two world lines temporarily converge, and for a while overlap?