Quantum Time
and the
Replication of Universes

"Everything that can possibly happen must eventually happen." Ever I since I first read that – and I've long ago forgotten where – it's intrigued me. I began thinking about how this statement could possibly be true. If you assume a coin-toss to be a random event (more on this later), then if it comes up 'heads', it must also, somehow, come up 'tails'. And all the possible outcomes must happen *in the same place and at the same time.* There was no ducking a multiple-universe theory. But this was just a start.

Background

The **Heisenberg Uncertainty Principle** is a part of quantum mechanics. In very simple terms, it states that, at the subatomic level, we cannot determine both the position and the velocity (speed plus direction) of a particle at the same instant. The more we know about its position, the less we know about its velocity, and vice versa. This means we cannot possibly predict where a particle will be at any future time.

One consequence of this was the statement that "Everything that can possibly happen must eventually happen." I can't find exactly when this statement first appeared (or where), but it was addressed directly in 1957 by Hugh Everett III in his **Many Worlds Interpretation.** This states that when something at the subatomic level can have more than one outcome, the "world" (universe, to us) splits so that all outcomes will eventually occur.

This is one heck of a lot of universe-splitting, and I had a personal problem with that. In addition, the Everett explanation assumes things I also had trouble with. First, Everett seems to assume a bit of "intelligence" at the subatomic level, such that particles (or even waves) seem to know if there's more than one possibility. Second, his explanation implies these particles also can communicate, or request, a universe-split – possibly multiple ones – to whatever is responsible for accomplishing this.

My problems with Everett aside, he at least proposed a theory that at least a part of the scientific community supports. From my end, he has successfully introduced the concept of multiple universes to deal with multiple possibilities. My theory diverges from Everett regarding the "when" and "how".

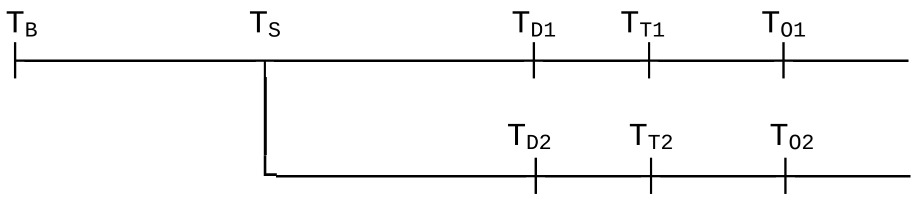
Our Random Event – The Coin Flip

First, there are really multiple random situations here: there's the coin-toss itself, of course, but there's also the decision to flip the coin in the first place. And, there's the decision of which coin to toss, where to toss it, etc. But let's stay with the first two. Let's call T_D the time of the decision, T_T the time of the toss, and T_O the time of the outcome (heads or tails).

Now, I'm going to add a third time, just in case we need it: Let T_B be the time of the Big Bang. So, we have this kind of a timeline.

This is very obviously not to scale, and the distances between the T-variables are not important. It's only necessary to depict what precedes what.

Now, let's say we can agree on a new point such that if we replay time from that point, we give "all things" a chance to happen. Call this point T_S (for 'split'). We can draw this:



Now we've given another outcome a chance. But suppose T_{O1} and T_{O2} are both 'heads'? How many iterations do we need to assure at least one 'heads' and at least one 'tails'? And there are other possibilities. Heads, top facing north, and top facing south. The coin lands on its edge. There are a *lot* of these.

Even if we could agree on where to put the point T_S, we could never be sure that we could account for all possibilities in a finite number of splits. We'd need that point, wherever it is, to split an infinite number of times.

Even worse, since the placement of T_S is arguable, and other random events are going on "all the time", we'd actually need each and every point, or at least the lion's share of them, to split an infinite number of times, and I just don't see that as workable. We need something else – something simpler, something more reasonable.

Quantum Time

Before continuing, let me first say I doubt the phrase "Quantum Time", or the general meaning I attach to it, is original with me. However, if you Google-search this phrase, you won't find anything that compares to my complete concept – at last nothing that pre-dates my original "Cosmological Mitosis" paper in 2005. I can tell you that these ideas were and are original to me, which is to say I'm not plagiarizing anything that I'm aware of.

My concept of quantum time is simply that although time seems to be continuous – always in the same direction (forward) at the same rate (one second per second) – it isn't. Time starts and stops. It works like a watch with a stop-second hand. It measures time in the forward direction, and the second hand moves at one second per second on the average, but it is not continuous. The second hand is mostly at rest, but then moves forward one second in a quick “gulp”.

Within a universe, this starting and stopping is not noticeable, i.e. time appears to be running in a smooth and continuous manner. But if we could view the flow of time from outside of the universe, we’d see the starts and stops.

```
 rest   running   rest   running        rest   running
      ├─────────┤      ├─────────┤. . ┤      ├─────────┤
 <- q1 ---------><---  q2  ------>     <-----  qn ------>
```

In other words, a “quantum” of time consists of a “rest interval” followed by a “running interval”. I will use the term “quantum time segment” to refer to the combination of its parts – the rest interval and the running interval.

Universe Replication

The preceding may or may not be an original idea, but this, I think, is: At some point in the quantum time’s rest interval, *the universe creates a copy of itself.* So (using q_2 as our sample quantum time segment) we have this:

```
├─────────┤     ├────────┤        (universe 1)
     t1 ------>|  q2a
               └┤   ├────────┤    (-> universe 2)
     t2 ----------->|  q2b
                    └┤  ├────────┤  (-> universe 3)
                        q2c
```

Here, at point t_1, the Universe 1 is in the rest interval for time quantum $q_{2a.}$ During this quantum’s rest interval, the Universe 1 generates a copy of itself (a new Universe 2, at time t_2) and subsequently enters its running interval.

The new Universe 2 starts with its initial quantum time in the rest interval for quantum time q_{2b}, during which (point t_2) it generates a copy of itself (the Universe 3) , and following that, it enters its running interval. And so on.

So, the quantum time segment q_2 in the first figure expands to the segments q_{2a}, q_{2b} and q_{2c} in the second figure (and, of course, it just goes on and on from there). All three, at the start of their “running” states, are exactly the same. But because of whatever random factors, they develop and end differently.

Back to the Coin-Toss

Using quantum time, we can avoid having universes spawning an infinite number of new ones at every infinitesimal point. No matter where you decide to put the point Ts (the ‘split’ point), the preceding rest interval for that time quantum will generate the universes which, collectively, will generate all possibilities.

What it Means

This theory of quantum time has some interesting consequences:

- For every event you can think of, there’s a set of universes where that event hasn’t happened yet. And in some, it never will.
- Think of the worst mistake you’ve ever made. There are universes where you don’t make that mistake.
- Our ‘tomorrow’ is, in some universes, has already happened, and in some of these, a ‘yesterday’.
- If the Big Bang had a time quantum with a ‘normal’ rest interval – and why shouldn’t it? – there are still universes where the Big Bang (its running interval) hasn’t happened yet, and always will be.

But I’ve saved the most interesting for last. This scheme of things is in no way dependent on how long the rest or running intervals are. It doesn’t even require that they be the same all the time in all the universes, or even in the same universe. One interval (rest or running) could be a billion of our years, and the next one a couple of our seconds. All of the conclusions are just as valid.

Conclusion

The first part of my theory – that time is quantized – is certainly not outrageous. It seems like every time I update my knowledge, something else has been quantized. And, multiple universes to deal with multiple possibilities aren’t anything new, either. About all I’ve done is to organize these concepts.

I like it, and I think Occam would, too. It’s simple, it’s easy to understand, and it addresses the problem without creating new ones. And – hey, you never know – it just might be true.

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