

Time and change and states of stasis

The riddle of whether change and time are interrelated or independent. And which comes first? Within our cosmos perhaps we have many different states of stasis and paths by which these states can be connected. Our universe could then just be one specific change journey, on one particular path between two states of stasis along an axis of change. Perhaps time begins after change gets going. Where the change journey started with the Big Bang and where the end will be in another state of stasis at the end of time - and the end of change.

Change

Any **change** can be said to consist of either physical change or temporal change or both. It is not difficult to conceive of a **physical change** which – for the observer – may be undetectable or which cannot be perceived. It could be beyond the abilities of our senses to perceive or our instruments to detect. But the physical change could still exist. So the abilities to be detected or perceived are not – in themselves - inherent characteristic of change. Even abstract thoughts in the minds of living things constitute physical change since thoughts occur only as a consequence of changes of configuration within the cells making up the brains of such living things. **I take physical change to mean where the spatial position or the energy level of at least one fundamental particle of matter within the system being considered has altered.**

But we cannot conceive - in our universe - of a situation where **temporal change** is absent, where **Time** stands still – whether or not any other *physical change* takes place. We can conceive however of a *temporal change* – no matter how improbable - where no *physical change* takes place. *Physical change* on the other hand always takes place together with *temporal change*. I take *temporal change* – the flow of *Time* – as then being a fundamental characteristic of our universe. But note that a *temporal change* is not *Time* itself. The concept of *Time* must come before a change in the status of Time (duration) can be conceived of.

My contention is that the concept of *Change* must come first and leads to the concept of *Time*. Then – and only then – can we come to *physical* and *temporal change* as being the constituents of *Change*. In our universe all instances of *physical change* are inextricably intertwined with *temporal change*.

Concept of *Change* >> Concept of *Time* >> *Change* = *physical change* + *temporal change*

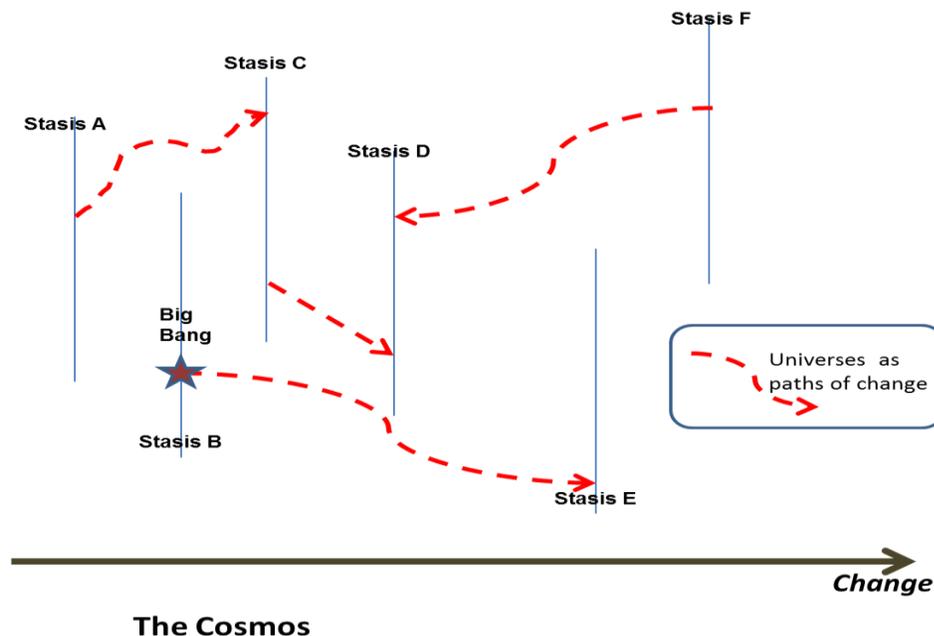
Change and stasis

The very concept of **Change** carries within it the concept of **No change** – which I call a state of **stasis**. Without a state of **Change** there is no framework within which **Time** can – or needs to - exist. It is this state of **No change** – changeless and timeless - which defines **stasis**. The concept of *Time* and duration would seem to emerge simultaneously with or after the commencement of *change*. But can there be *Change* **without** a concept of *Time*? *Stasis* was/ is /will be where *Change* is not. There may be many different states of *stasis*. Whether states of *stasis* can precede or follow periods of change is indeterminate since without change - and therefore without *Time* - there is no **before** and there is no **after**.

- For *Time* to commence, a period of *Change* must be in progress. A concept of *Change* is required for a concept of *Time* to exist.
- For timelessness (i.e. for an absence of the concept of *time*), a state of *Change* cannot be in existence. If an existing state of *Change* can cease then a state of timelessness becomes possible.

Therefore *Change* must either “precede” or be “simultaneous” with *temporal change* but the concept of *Change* must precede the concept of *Time*.

If the Big Bang represents the start of a period of *Change* then “before” the Big Bang there was (or must have been) a state of *stasis*. And perhaps there will be *stasis* again - at the end of all things, at the Grand Coalescence, at the end of all motion, at the end of *Change* bringing with it the end of *Time* itself? In a state of *stasis*, and since there will be no *Change* and there will be no *Time*, every particle in the universe will be unchanging and motionless – no rotating galaxies or suns or planets, no expansion or compression of the universe, no motion of any kind, no spinning electrons or vibrating particles, no forces at play and no radiation and no energy flows and no life. With no forces available there will be no particles bound to any others and no energies in flux. All matter will be reduced to the fundamental particles. No matter how many fundamental particles actually exist they will all be totally motionless. They will be in some particular configuration relative to each other but motionless. There will be no need to invoke the existence of dark matter or dark energy in such a stasis. But we cannot refer to a "period of stasis" or "during stasis" or “before stasis” or “after stasis” since there can be no duration for the *stasis*. There can be no **start** and no **end** if *time* is undefined. The state of *stasis* merely is “where” (rather than “when”) *Change* is not.



Perhaps that is what the cosmos is. Multiple states of timeless *stasis*, each distinct and separate, connected – on occasion - by periods of change during each of which a concept of *Time* emerges. A period of *Change* is then a journey from one stasis state to another and perhaps such a change journey is what

defines a universe. Our universe maybe exists and lives its life within one such period of *Change* along a particular path between two states of *stasis*.

Is our universe then a particular state of change, a particular journey along a particular path from one state of stasis to another? Where the path of Change defines the flow of Time? Where the Big Bang initiated the journey along a path set by the particular configuration of the universe at the point of initiation? Each of the many state of stasis would then be characterised by its particular configuration of particles within that universe and each such state of stasis would have a different configuration. The configurations of the universe would have changed from one state of stasis to another but within and between these states there would be no concept or dimension of time.

And since there can be many possible states of stasis we come to a possible concept of *Change without Time in a cosmos which is outside of but encompasses the confines of Change and Time.*