On Time within the Field of Universal Matter

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1 Preface

Time is a word used often in arts, literature, and science. When a word is so often used, it loses definition, so we might ask 'What is time?' or 'Does time even exist?'

2 Definition

Let's set out to find some answers. To accomplish this task, let's consider some general concepts of time:

- Now Time
- Travel Time
- The Flow of Time

2.1 'Now' or Existential Time

It is common to hear people say things like:

- I am hungry.
- I am tired.
- I want to eat.

One could add the word 'now' to end of each of these statements. They speak to our existence; a convenience about our condition - at the moment. The statements do not hold any significance as to measured time: We made statements like these long before there were any clocks and they made just as much sense as they do today. This stateless, existential time regards just 'here and now'.

2.2 'Travel' or Relativistic Time

Another use of time is used when we are leaving someplace and traveling to somewhere else. In so doing we might ask:

- Are we there yet?
- When will we get there?
- How long will it take?

All of these sentences suggest that there's a period of time between leaving a place and arriving somewhere else. Travel time is measurable and seems to align with 'relativistic time' as discussed by Einstein.

2.3 The 'Flow' or Arrow of Time

Articles about physics often discuss another concept of time called "The Arrow of Time" (AoT). This concept suggests that time is asymmetric, that is, it seems to flow in only one direction which we think of as 'forward'. We age, we do not get younger. Things break, they do not spontaneously fix themselves. This concept is not about measured time, rather an inflexible flow, or arrow, of time moving in only one direction.

3 Application

The Natural Philosophy of Universal Matter, herein the Philosophy, does not explicitly define time but does offer some insight into its nature. The insight lies within the relationships of building compositional matter and the resulting by-product of {f} sub-particles.

3.1 {f} Sub-Particles and AoT

In the Philosophy we find two basic, defined actions that take place in the lowest level of Universal Matter: That is when two particles of {f} (the set of all Universal Matter) collide. There are two defined results: One where the two particles find a foothold in either or both of each other and remain connected together; and one where they collide but rebuff one another and go about their separate ways. With either case, the Philosophy defines a possible, separate result from either interaction, that is where small pieces of either or both interacting particles of {f} break off, becoming independent, energetic sub-particles of {f}. It is here, in these interactions and sub-particles, that we find the source of AoT.

Our universe is not permanent or eternal. As particles of {f} interact and compose larger particles, the set of all {f} suffers wear-and-tear, forming an energetic 'dust' of {f} sub-particles. Sub-particles of {f} do not, and cannot, rejoin particles of {f} or other sub-particles of {f} and reform into fresh, new particles of {f}: The damage is permanent. We perceive this unavoidable effacement of {f} as the AoT. It is the basis of the flow of time.

Our universe cannot process the building of compositional particles without wear-and-tear and our universe cannot heal from the damage caused by these processes.

3.2 Movement and Travel Time

In travel time, or relativistic time, the key idea is the traveling itself. In some form, at some time, travel requires the expenditure of energy. Here potential energy, say of a machine or an animal, is converted to kinetic energy, or work. Work requires the interaction of matter and the foundation of all matter is Universal Matter, that is the set of {f}. These interactions invariably produce {f} sub-particles which underlie the AoT. So, yes, travel time is real time: It uses matter and energy which results in wear-and-tear to the universe. It may have been measured in various ways across the ages, but its nature has not changed.

3.3 Movement and Now Time

This brings us to the final category of time, that of now time, our 'being' in an existential state. We must consider this state as we abide on our planet. Let's take a step back and consider our plight in the here-and-now.

Einstein elegantly demonstrates that space and time are intrinsically bound together into one thing, spacetime. While his formulae demonstrated these phenomena, they did not provide insight into the nature of spacetime. The Philosophy works to fill in the voids of understanding. In his Special and General Relativity papers Einstein speaks of a 'curved' spacetime. This curved spacetime that stands at the heart of relativity and it must be considered when transforming time and space (distance) between inertial frames of reference.

The Philosophy provides the basis of understanding Einstein's 'curved' spacetime in composite particles. In the paper 'On Particle Movement within the Field of Universal Matter'[1] we find the definition of two types of space: Standard and Composite distributions of {f} particles. The later type is of interest here as composite distributions form a dense cloud of composite matter.

Let's take a moment to reflect on the compositional processes discussed in the Philosophy. These processes bring the underlying particles of {f} into ever larger compositions of {f}. Our planet and our star are examples of these compositional distributions. Composite distributions are an overall set of composite matter which are denser at their core and thin as one moves outward into the 'regular' (Standard Distribution) space that surrounds these massive objects.

How does this relate to existential time? The key idea is movement. As noted in the discussion above regarding travel time, traveling requires energy, which requires the interaction of matter, which produces sub-particles of {f}, which brings us to the AoT.

Even when we are just sitting here on our planet and saying 'I am hungry (now)', we are still in motion. We are never still, that is truly motionless, in space or time. It is not possible for us to find, or be in, a place that is truly still. We are always moving, motion causes wear-and-tear, which brings about sub-particles of {f}, which means now-time is a type of real time.

[1] Published under the umbrella of the Natural Philosophy of Universal Matter.