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In search of Absent Time:
An artistic inquiry into the nature of Time, Space, Information and Energy or an Introduction to InfoSystem Theory

Ed. Julia Druk

"… there should be time no longer …"
Revelation 10:6

"The charms of a passing woman are usually
in direct relation to the speed of her passing."
Marcel Proust "In Search of Lost Time"

A River of Time

The "river of time" has long captivated the human imagination. The image of this river's immutability, eternal nature and constant, flowing current has proven to be one of the most long-lasting conceptions of all time. Our psychology is so well-suited to this poetical concept that we have become entirely dependent on it in our interaction with the outside world. Abandoning the myth of time as a flowing current would mean orphaning ourselves of its seemingly impenetrable charm. While numerous theories approach a new, fuller understanding of time, even scientists have not yet found a way to fully place their conception of time in one "space time continuum." Instead, we imagine contraptions that would allow us to dream within the myth – in order to cross the river at will, to swim against the current, we have invented the fantastical "time machine."

Current "Time"

Let us use the example of a fish that lives in a river with a strong, directed current against which it cannot move. Having spent all of its life in this river, the fish considers the current as one of the inherent characteristics of its environment, that is, the water that it lives in. But we know from an outsider's perspective that the current of a river is determined by the earth relief and by gravitation, that is, by a number of outside factors. We can therefore say that the current is not one of water's necessary attributes and therefore not an inevitable part of the daily life of the fish. Our perception of time, however, is parallel to the fish's view of the current. Having lived within an environment that seems to be subject to the forces of time, we have long stopped questioning it's nature and have accepted it as intrinsic to our world.

Much like the fish, we have each made this conclusion based on observing and interpreting the world around us. The human body is equipped with various sensory mechanisms designed to perceive and organize information. Our eyes, nose, tongue, ears and skin make outside stimuli understandable to us in very particular ways, as "color," "smell," "taste," etc. Our perceptions determine the look and feel of our world. Time can be considered to be no different. Having long perceived repeated and regular changes in similar

objects, for example the process of human aging or the spoiling of foodstuffs, we have learned to interpret their cause as the passing of time. In other words, our view of time has been determined by the ability of our perceptual organs to detect changes in the surrounding world, the apparent impacts of the “flow” of time.

Time and Aging

The limits of such a view of time do not allow us to determine the nature of time itself, but only its seemingly mysterious impact on the objects that surround us. Having inferred early on an initial cyclical process of the relative movements of the sun and the earth, we have trained our perception to measure all other changes in these very terms. But are the changes in objects that we relate to aging and the passage of time as predictable as the circular movements of the clock that we have designed to measure them? It is obvious that the answer is no. Even similar objects can sometimes change in drastically different ways.

As an illustration, let us take two identical books, both published and released in the same year. We can say that their initial composition, or what we will call their *informational structure*, is therefore identical. Let us now take one of these books and place it in a well-maintained private collection while leaving the other to a public library. If we wait thirty years before picking the books up again, we will note some obvious differences. The first, kept by a private owner, will probably look as good as new; the other will show some obvious signs of aging such as a worn-out cover, torn and yellowing pages, stains and creases. The reason why these objects’ initial *informational structures* have changed in such different ways seems apparent.

The second book, unlike the first, was understandably subjected to a constant interaction with the people and the objects around it who have each left their assorted impressions on its pages. A stain here, a tear there, and we begin to see a certain type of record of how the book aged according to what information was marked on it; in other words, we can read the book’s *informational imprint* as a record of how it aged, or changed, due to its interactions with its environment. What would this *informational imprint* look like for the other book? Assuming that its owner took care to keep it isolated, dry and unread, the record would mimic the book’s condition – virtually unchanged. In terms of human experience, the trope of a parent who has aged overnight or, conversely, a patient in lethargic sleep that seems to avoid the common signs of aging, echoes this phenomenon.

In all these cases, we are looking at a difference in the informational record, or the *informational imprint*, of interactions between given humans or objects and their environment. From this, we can draw two very simple conclusions. The first is that an object changes depending on the nature of its contact with its environment; in other words, an object ages according to how its *informational structure* accumulates information. The second, following from the first, is that *structural change within the object is not linked to the passage of time in the way that we conceptualize it, but to a change in its informational imprint*.

The Cosmic Object

To put this idea in more abstract terms, let's imagine a Cosmic Object that exists in a perfect vacuum somewhere in outer space, leaving the details about its shape, location and trajectory as necessary unknowns. As observers, we know nothing about this object but the fact that it exists, and that it is not subject to any interactions within its given environment or within its inner properties. We may now ask ourselves whether time as we understand it exists for this object.

Now let us imagine that this object collides with another object and, as a consequence, changes both its shape and trajectory. Considering our earlier discussion, we can now say that what has actually happened was that the two objects exchanged information. That is, that they both left *informational imprints* on one another and changed their initial *informational structure* accordingly.

Having previously known nothing about our Cosmic Object, we can now analyze its *informational imprint* and conclude with all probability that it had once collided with another object. This allows us not only to examine the current state of the object, but also its previous state. The *informational imprint* or the record of change within the object thus serves as a referent in analyzing what we would normally term the "present" and the "past."

Information and Codification

We have shown that each object can be studied in terms of its *informational structure* and *informational imprint*. In other words, every object is composed of the information that goes into its inner composition, as well as the history of its subsequent interactions with other objects and the changes that result. Every object is thus a repository of information, or what we can term an *informational system*. It follows that our greater environment, that is the set of everything that exists around us, is therefore essentially an *informational field* that houses a given number of such *informational systems*.

It is important to make a further distinction between two types of information that can be contained both in individual informational systems and in larger informational field. That is, what we will call *encoded information* and *actualized information*. The first, *encoded information*, refers to the body of data, knowledge and phenomena that exists in such a state that it can be both indefinitely preserved and reliably reproduced. We can classify the corpus of human knowledge preserved in the arts, in scientific and mathematical formulas, and in spoken and written language, under this category. On the other hand, physical objects and phenomena of our material world represent the second type of information, one that is *actualized* in physical space and, unlike *encoded* information, subject to interactions within its physical environment.

This distinction is useful in several different ways. First, we can now specify that when we speak of *informational systems* in terms of how they are affected by the changes produced by their interactions, we are therefore referencing this latter type of information. In other words, *encoded* formulas or

words are not subject to change or aging, they cannot look “older” or “younger;” however, since *actualized* information exists in a field of physical interaction, it is subject to such changes and can therefore be examined in these terms. Second, we can now examine the relationship between the two types of information, that is how *encoded* information can become *actualized* and vice-versa.

We know that physical, or *actualized* information, can be encoded in many different ways; we can encode a physical object as a poem (“a rose by any other name”), as well as a chemical or mathematical formula. Analogously, we know that such encoded information can be spatially unfolded, or *actualized*. In constructing a building, a bridge or a plane, for instance, we are using information codified in mathematics and physics to develop an actual object in space. If we return to our earlier example of the two books, we can also see that a give object can contain both *actualized* and *encoded* information – our books are at the same time physical objects subject to influences from their environment, and mediums for the transmission of information encoded in their textual content. We can apply this same type of analysis to other *informational systems* as well.

Space and Information

In the same way that a human being is developed in space from information that has been encoded in DNA, a bridge or a plane is developed in space from information partially encoded in mathematical and physical formulas. If we further examine this process of *actualization*, or of “development in space,” we come to the notion of Space as the very environment, or *informational field* we referenced in the last section. That is, we can now say that space is defined by the inter-relationships of *informational systems*, or objects, that are contained within it.

Different regions of a spatial field therefore contain varying types of *actualized* information that is structured via different methods and at different levels of encoding. Information, in this instance, becomes defined as *structured space* which takes on greater or lesser levels of complexity depending on the nature of the particular *informational system* in question, e.g. the difference between the complexity of a human being, a piece of metal, a social group or a language.

We must leave open the question of how to determine the levels of such complexity. We propose, however, a mathematical apparatus that would, for example, take an atom as the level 1 of *structured space*, then the molecule necessarily following as level 1.1, or even level 2. However, we must fully establish such a reliable system of measurement for determining the varying complexities of information between disparate objects in order to fully benefit from this line of examination. We must also decide whether, indeed, we can assign negative levels to information, and therefore to structured space, as well as the problem of how to define the structural complexity of a spatial vacuum, or the ostensible absence of information.

Time as Coefficient

Having now conceptualized space as a field containing various *informational systems* that is defined by their interactions, we can now return to our example of the Cosmic Object and the question of whether time indeed exists for it. It now becomes evident that, in the absence of interaction or the exchange of information between the Cosmic Object and another *informational system*, we do not have a frame of reference of determining the changes to its *informational structure*, and therefore can not attest to the presence of time as we understand it for the Object. This inevitably leads us to the more general conclusion that there is no linear "flow" of time as it is perceived by humans, but rather that change is determined by the multiple "collisions" or informational exchanges between *informational systems* or pieces of *structured space*.

Having said that, we are still left with the problem of defining time in practical terms. On the one hand, we can say that the human perception of time as a linear progression, subject to the cyclical rhythms of planetary motion as a defining measurement, is nothing more than a process of human interpretation of the changes occurring in our environment. Such changes, on the other hand, are not subject to any unified rate of progression but rather depend on the individual interactions taking place between groups of *informational systems*.

In order to define a reliable system of measurement of these changes that does not depend on a human schema of time, we will rely on an initial distinction between the informational system being changed, and the informational system that is changing it. It is useful to keep in mind that such a distinction is necessarily simplified for explanatory purposes, and that any given interaction affects all the informational systems that take part in it. In the case of the object that is being changed, however, it is useful to say that its susceptibility to interactions with outside objects is mediated by the durability of its original *informational structure*, or its *resistance* to outside force. In the case of the object that is interacting with it, its own ability to produce change within the former is similarly mediated by the strength of the force that is applied to this purpose. While this may seem counter-intuitive, it is plainly evident in our daily life, as we know that the more resistant the object is to change, and the more force required to change it, usually equals a proportionally longer amount of time required for the task.

In other words, the passage of time according to our perspective, or what we may now call the *Coefficient of Informational Change* (Ti), is directly proportional to the structural strength of a given informational system, or its *Coefficient of Resistance* (Tr), and is inversely related to the strength of the force that is acting upon that system, or the *Coefficient of Force* (Tf). While not representative of a constant rate of change as per a linear view of time, our Ti is dependent, rather, on the following relationship:

$$Ti = Tr/Tf$$

We can go back to our earlier discussion of the levels of complexity of *structured space* in order to add that Ti can further be manipulated by adding to, or subtracting from, the complexity of information within a given system of interaction. In constructing a bridge, for instance, adding a piece of machinery, i.e. an *informational system*, that is directed toward increasing the Tf will reduce the Ti for that exchange. Similarly, the addition of information that is applied toward decreasing the Tf of a given interaction will increase the Ti for that system. While we have here used the example of a physical machine, *encoded* information can also play the same role in influencing the Ti of a system. Regardless of whether the applied information is *encoded* or *actualized*, the higher its level of structural complexity, the greater its potential to manipulate the Ti. We can therefore analyze both types here on the same numerical scale that measures the structural complexity, or level of an *informational system* counter to the amount of work or energy divested in it.

The New Face of Time

This equation demonstrates two major points; that the progression of time is specific to each informational system rather than a linear momentum common to all, and that it is furthermore dependent on the unique characteristics of these interacting systems. The picture that this paints is one not of a river of time, but rather an ocean of time where, using common terminology, time moves in different directions and at varying speeds at every individual point in space. In our terms, we would say that there is a unique coefficient of informational change for any particular region of structured space, and that this Ti is codified by humans into a shared perception of time which is measured relative to the Ti of a single interaction between two informational systems, that is, the sun and the earth.

We can thus conclude that there is not an absolute past or future, but only an infinite informational field of constantly changing information. While these concepts cannot exist anywhere but our own perceptual understanding of the world, we still operate within these terms as we have operated in terms of “sunrise” and “sunset” before and after the work of Galileo. Therefore, we propose the view that everything within our world, that is the infinite informational field is a piece of either codified or physically actualized information that appears, develops, interacts and disappears according to a particular set of unified laws. Stars, planets, atoms, molecules, foodstuffs, animals, plants, insects, hurricanes, social groups, art, literature, religion and science itself, are all such informational systems and can, in our view, be unified and studied within these yet-undiscovered principles that, when seen from this perspective, appear common to all.