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PROCESS-RELATIONS IN "TIME EXPERIENCE"

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Abstract. I analyze here process-relations in time experience. My thesis is that McTaggart's series A and B are process-relations. I demonstrate how McTaggart's unreality thesis should be replaced by a relativity thesis: Series A and B are relations of processes: asymmetrical and ordered. The coordinate system of time experience is centered in our living body, in its life process, which is directed against entropy increasing: biological arrow. From that flowing position we first experience series of events and they all are ordered in direction past–present–future. From the same position we experience a "backflow": we first expect, then perceive, and then remember an event in a series: future–present–past. Life process, directed against entropy increasing, which I call "biological arrow" is basic explanation of time experience. Time as such does not exist – only processes (series of states) exist. I suggest some small experiments to demonstrate my main points and to argue against the transcendental phenomenology of "time consciousness".

Keywords: time; experience; relativity; process; life; entropy

Introduction

Imagine we stay on the bridge and watch the river's movement backwards. In the same time, we experience a flow of our body against the water forwards. We see that one movement could be taken from one position in reference to the river and to our body staying on the bridge as in opposite directions.

Now imagine we swim against the river's flow. Again, one and the same relative movement could be taken as our body swimming forwards and river flowing backwards. But if we stop swimming we flow back together with river's waters and no movement is experienced.

Here we have processes related and that kind of relation is very specific. I call it *process-relation*. Process relation here is a correlation between minimum two processes in one space/time, which are inter-dependent and could be perceived, observed and described as one or from every one of them as a moving coordinate system.

Analyzing time in a position of "now" (A-analysis), we define a flowing experience of a process, or processes in tenses: past-present-future. Relativity here is: "now" is not defined without a relation to "before now" and "after now".

Without future and past, present is not defined, not perceived, and could be taken as not real (illusory). A pure essence (Time), which flows, does not exist (Gerdhhikov, 1996: 65).

A process of flowing, not related to other process, does not exist. There are co-related processes, which produce "perceptual time". I identify these co-related processes as a life process of the perceiving body and a non-live process against it, the process of spontaneous entropy increasing. Variants of that thesis evolved from my *Limits of Science* (Gherdjikov 1995), through an article (Gerdhhikov, 1996), to my *Scientific Explanation of the World* (Gherdjikov, 2000). Let me discuss that thesis again, in form of process-relational analysis. I am focusing here on the *relativity of time experience*.

McTaggart's analysis: relations

For more than a century, John McTaggart's argumentation of the unreality of time has been taken as a starting point for many reconstructions and in a very complicated discussion in thousands of papers and books about time.1

I focus here on a particular point: the process-*relativity of time experience*.

McTaggart starts with his own belief in the unreality of time (McTaggart, 1908), pointing that "in the philosophy and religion of the East we find that this doctrine is of cardinal importance" (ibid.). He also mentions, that some Western philosophers (Spinoza, Kant, Hegel, and Schopenhauer) deny the reality of time.

For the sake of brevity I shall speak of the series of positions running from the far past through the near past to the present, and then from the present to the near future and the far future, as the A series. The series of positions which runs from earlier to later I shall call the B series. (McTaggart, 1908: 458)

McTagart's conclusion runs as follows:

Thus we seem forced to the conclusion that all change is only a change of the characteristics imparted to events by their presence in the A series, whether those characteristics are qualities or relations… It would place the determinations of the A series in a very unique position among the characteristics of the event, but on any theory, they would be very unique characteristics. It is usual, for example, to say that a past event never changes, but I do not see why we should not say, instead of this, "a past event changes only in one respect – that every moment it is further from the present than it was before"… For if, *as I believe, time is unreal*, the admission that an event in time would change in respect of its position in the A series would not involve that anything really did change. The B series, however, cannot exist except as temporal, since earlier and later, which are the distinctions of which it consists, are clearly time-determinations. So it follows that *there can be no B series where there is no A series*, *since where there is no A series there is no time* (ibid., 460 – 461, italic mine).

1. McTaggart's conclusive argument is not precise here. Is it really true that without A series there is no time? Without a perceiver there is no A series: no present, therefore no future and no past – there is only the before-after on

the line of time (series B). But does the relation between moments (events or static moments) involve quality (to be in time)? Here, in a footnote, McTaggart specifies: "I assert that a relation Z between X and Y involves the existence in X of the quality "having the relation Z to Y" so that a *difference of relations always involves a difference in quality*, and a change of relations always involves a change of quality." (ibid.). There are many clear cases, in which we cannot assert change in quality involved in the change of relation. Quality is a matter of internal relations in the relatum itself. We are here in an undefined situation: we could define the quality of a thing (e.g. time moment) as relational to other thing (time moment). But the line between internal and external is relative and could vary. Basic notions require basic premises; they vary, and that is a basic uncertainty. What is *non-relative* and certain here is that an event Y permanently follows X, and that we never remember the future. A specific moment is permanently placed between other specific moments.

How could there be *two time series* (A: past-present-future, and B: before-after) in one and the same time stream? My answer is: only as *two distinct relations*.

Series A is related to a *perceiver*: only a perceiver resides permanently in the present, and is able from that point to expect the future and to remember the past. Perceiver-centered series A can be considered as *illusion* (see Stefanov, 2016: 208). So, we go to series B or B-theory. Series B is a simple relation of a *permanent sequence* between moments without reference to a perceiver.

2. McTaggart's statement of the unreality of time *is a premise*, and it does not follow from his analysis: being past, present, and future for one event means not unreality, but *relativity of "time" with respect to the perceiver*. What follows is that *time series are relative*. Taken out of their mutual relations, they are indefinite, and *their reality is undecidable*. We can't decide if time is real, or not, just based on relations. Reality here is a matter of belief. That is so because of the *unrelatedness of "reality of time"*. So, a huge confusion follows, and that confusion is a core of undecidability in long debates on time *in respect of reality*. Even if we agree that time is not real, time experience and irreversibility are still real, so we must still explain time experience with its series, and relevant thermodynamics, biology, and psychology.

Tense circle

The debates over McTaggart's analysis are very hard to overview. Here I mark only some points, related to "tense circle" and resolvable by *time relativity*. There is a consensus on the existence of two theories: A-theory and B-theory. Bigelow (1991) defines A-theory as the thesis that time flows, that we cannot properly analyze tense, or that B-properties, like *earlier than* and *later than*, can be defined in terms of past, present, and futurity. According to some philosophers, such as Williams (1996) there is even no genuine debate between two different types of

theories. In short, it is hard to characterize what exactly the necessary and sufficient conditions are for being an A-theorist or B-theorist.

Some A-theorists analyze tense via counterfactual conditional theories (Parsons, 2002), others form a sort of tensed logic where "time is modality" and talk of replacing "truth-at-t" with "truth-at-a-world" (Parsons, 2003); and some form a sort of tensed logics where "an event at a past" is "an event that could be stored in the memory of an observer *o* at location *l*", and presentness and futurity are applied accordingly in terms of possible conscious experiences and expectations.

Josh Parsons (2002) defines the A-theory of time as the thesis that pastness, presentness and futurity are monadic and intrinsic properties, whereas B-theory denies that there are these A-properties. According to the A-theorists, things in time lie in the past, present or future on the basis of their possession of these mentioned properties. They "imagined a continuum of such properties, stretching from the distant past to the distant future, as if... past times were colored in deeper and deeper shades of blue, and future times in deeper and deeper shades of red" (Parsons, 2003: 6).

Another way of thinking about events is in terms of their relations with one another *independent of the present* (observer): B-theory. The set of events construed in this way is called the B-series where one event is "earlier than", "later than", or "simultaneous with" another event. B-theory is not free of relativity. That kind of theory we find in physics and here comes Einstein's relativity of time for different inertial systems. Instead of "now" we use here a zero point of a coordinate system with a watch. According to B-theories pastness, presentness, and futurity are somehow "mind-relative", whereas A-theorists consider these to be mind-independent features of events. According to Mellor (1998), some B-theoretical explanations for the experiences of temporal passage incorporate the accumulation of our memories over time. B-theorists maintain that when one describes an event as happening in the present, one does this at a specific moment of time, and the description is true *if and only if* the event takes place *simultaneously with the description* of it. But that is relative to velocity of an inertial system with a watch in its center, so *it is not free of relativity to observation*.

According to Clifford Williams, this way of distinguishing between the two theories makes A-time "just as spread out as B-time." (Williams, 1996: 379 – 80). If an event contains a property, then in some sense it exists, according to Williams. So, if we illustrate the view of A-time, it is the view that future, present and past events are in some way equally real. Williams then says that "it is not evident how the shift of presentness from event to event in A-time differs from the transition from occurrence to occurrence in B-time." (ibid.) Williams's conclusion is that A-theory and B-theory do not differ from one another. Here an elimination of *specific relativity* to observers occurs. Parsons (2002) characterized this conclusion as a mistake, and said that "if we conflate the A-theory with the view that time

passes, that only past exists, or that tense is unanalysable, we shall end up in the same position as Williams, unable to distinguish A-theory from B-theory, since there are recognizable A-theories held by self-ascribing A-theorists who deny these other theories" (Parsons, 2002: 4). Here I find a set of confusing moments, forming a false opposition: substantivalism versus relationalism.

If we stick to that opposition, we do not have a solution of the so called "McTaggart's paradox": the A-series involves a contradiction when events are described as being parts of this series, therefore time is unreal. Every event begins as being far away in future, then later becomes present, and finally becomes an event of the ever growing and distant past, so it appears that an event *does possess all three properties* of past, present, and future (Dainton 2001, 15); and this so-called A-series seems paradoxical because the characteristics are incompatible. An event exemplifies all of the A-characteristics, which contradicts the first notion that nothing can contain more than one of these A-properties.

McTaggart: "If M is past, it has been present and future. If it is future, it will be present and past. If it is present, it has been future and will be past (McTaggart, 1927: 329). Here I can't find any paradox, I find *tense circle*. The contradiction does not exist in common speech when one says that event E is now future, (tomorrow) will be present, and then (after tomorrow) will be past. In metaphysics we still stay in paradox, if we try to define tense moments non-relatively, as properties, attached to events. Relativism is also wrong, because one event never changes its position on the time line.

The paradox seems resolved if we consider that *to be* future, present, or past *are not true* in one and the same moment. McTaggart anticipated this response as follows:

It is never true, the answer will run, that M is present, past and future. It *is* present, *will be* past, and *has been* future. Or it *is* past, *has been* future and present, or again, *is* future and *will be* present and past. The characteristics are only incompatible when they are simultaneous, and there is no contradiction to this in the fact that each term has all of them successively (McTaggart, 1908: 468).

But then we are in a *circle*: we define tenses with the same tenses. That seems as a real argument against reality of time. Parsons (2002) characterizes this as the problem of *intrinsic change*. The intrinsic change "poses *exactly the same problem* for the A-theorist as for everyone else. Stock solutions of the problem of change to which B-theorists happily help themselves work in exactly the same way for A-theorists. The problem . . . cannot be regarded as a *reductio* of the A-theory in particular" (Parsons, 2002: 7).

According to Mellor, McTaggart's "critics have reacted by denying the viciousness of his regress. At every stage, they say, the appearance of contradiction is removed by distinguishing the different times, at which events have different tenses. They ignore the fact that the tensed means they use to distinguish these times are also subject to the

contradiction they are trying to remove. However, the debate by now is too well worn to be settled by mere repetition of McTaggart's proof, sound though it is." (Le Poidevin & MacBeth, 1981: 53).

So, it is inevitable to appeal to "second-level predicates" in order to answer the paradox. They are appealed to in order to escape the original McTaggart paradox, but again every event possesses all of the second-level predicates. A-theorists may claim that no event has all nine of the second-level predicates at the same time; they have them *successively*. However, that successiveness is tense-dependent. So, we have the same circle and we can conclude that time is unreal or that time is unanalyzable. We can find many variants of formulation, for instance:

A-series is self-contradictory, because the characteristics past, present and future are clearly incompatible, and yet every event has them all. The obvious objection, that an event has them not simultaneously but at different times, merely transfers the contradiction from the series of events to the series of moments, and in turn each such moment must be past, present, and future. Nor can a moment have these characteristics at different times – e.g., by being present at a present moment and past at a future moment – without supposing a meta-time with respect to which the A-characteristics of moments can change. But the contradiction reappears in the meta-time series, each position of which must have A-characteristics subject to change in a meta-meta-time; and so the contradiction is avoided only by entering a viciously infinite regress. (Mink, 1960: 253)

The A-theorist runs into an infinite regress problem in his attempt to respond to the claim that there are contradictions in the usage or implications of the A-series. Moreover, time does not appear to be something that is infinitely divisible at least in respect to finite events that take place; this can be illustrated by Achilles' paradox (Honderich, 1995).

Many answers have been given to that point, in a sense that the paradox is not genuine, but they do not escape the tense circle. Smith responds to McTaggart's supposed paradox with this characterization: Quentin Smith (1993: 171), C. D. Broad, E. J. Lowe (1998: 46), Barry Dainton (2001: 65).

Michael Dummett (1978) argues that we either must take McTaggart seriously when he asserts that every event has the characteristic of being past, present, and future; or, put differently, we should seriously consider that our ordinary views about time entail, in some sense, that this is the case.

So, we cannot escape McTaggart's paradox with the introduction of higher-order predications. We either run into the problem of an infinite regress or into a contradiction.

The order of events still remains. Order is relation, but it is not relative. All confusions come when we analyze McTaggart's paradox from a *non relative metaphysical position*. An alternative is a *transcendental explanation*. A. Stefanov defends such position (Stefanov, 2008: 209)

Process relativity explanation

How can an illusion be is so deeply "imprinted" in our brains/minds? Is it transcendental (Stefanov, 2016), or just biological? Is it due just to brain/mind structure? Brains do not exist independently from living bodies. Living bodies do not exist except through and in non-living atoms, molecules, energy and entropy. Living is working against entropy increasing, which is permanent.

1. There is no pure Time. Taken as non-relative, time is dissolved. There are processes in sets of relations. What kind of relations are time series: before–after, and past–present–future? My answer is: Time relations are *process–relations, relations* between processes. Moments follow in an *irreversible order*. But we never experience pure moments: *we experience, and physics observes, only events within sequences*.

We *do not experience flow as a pure consciousness* (Husserl and followers). We experience some time-flow also unconsciously. We observe and measure the flow of entropy, biological self-organization, re-synthesis of living structures, expansion of our universe.

2. *We experience everything in our life process*. Our life "flows" from past through present to future. We were born in the past, we are living now, and we will die sometime in the future. We *expect* the future and *remember* the past, and that is the only definition of future and past in experience. This asymmetry we call "irreversibility of time". This is not just some subjective flow. The dates in calendars, even as conventional artefacts, follow the same irreversible order. Individual time experience starts to "flow" from the moment of birth.

3. A. In reference *to a living body*: we first experience a previous event, then the next one, then the event after it, etc., and they are ordered in direction past–present–future. This is the case for every process.

B. In reference to *events experienced*: events are experienced in a series: future – present – past. So it is for every series of events, experienced in the life process. Therefore, "running from the far past through the near past to the present" (McTaggart) is ambiguous without reference to the perceiver's "now", and in that reference frame the sequence of *events experienced* is *a back-flow*: we expect one event, then perceive it and then remember it.

Stefanov accepts a solution of Hermann Weyl: "Only to the gaze of my consciousness, crawling upward along the life line of my body, does a section of this world come to life as a fleeting image in space which continuously changes in time[1)].

This is really a solution to the problem at stake, since it explains the phenomenology of time, passage, keeping the validity of the B-theory of time. Yet this solution is a kind of hypothesis, in so far as it is confronted with two difficulties, which have to be surmounted in order the suggested solution to be accepted as plausible. The first difficulty is the need of elucidation of the "upward"

direction along the world-line of a person's body. One is not supposed to say that this direction points to the future events to which my consciousness will be aware of, because in this way one would tacitly admit the validity of the A-theory of time.

It is my claim that this difficulty can be surmounted by involving the notion of the arrow of time. (Stefanov, 2016: 220)

I agree and also formulated a *biological arrow of time* in my book (Gherdjikov, 1995) and article (Gherdhhikov, 1996):

This forward orientation is an organic fact: we expand "forward", over against the world, which, in this way, flows out backward. The expansion of life against the chaos (*phys.* entropy) is the "reason" for the space and time irreversibility. Life flows against the chaos…The future is a positive quantity and is "fitted" in at the front; the past is a negative quantity and is "fitted" in at the back. This is a reproduction and expansion against the unconditional entropy. This upstreaming calls into being our sensation and perception of time. (Gherdhhikov, 1996: 65)

Transcendental explanation is expressed as follows: "This is simply the mode of our temporal access to the world, which is possible because of the *a priori* form of the internal sense as an organizer of human experience… Temporal flow is a structural feature of finite minds." (Stefanov, 2016: 221)

That solution is possible if we take mind independently, and that means, irrelatively. But that is not the case. Minds/brains are biological functional structures in bodies.

Biological arrow – explanation

1. From the moment of conception individual life flows as a process of ordering "out of chaos, which runs backwards*" from past to present to future*. A living organism harvests energy from its environment and spends it as work for the re-synthesis of its structures, which are being spontaneously *destroyed in the process of increasing of entropy*. This is the living process itself; it flows forwards, against entropy, which so flows backwards. Now we expect future moments and events, when they come, we will perceive them, and after that we will remember them. In our last future moment, this lifetime flow will collapse. That's why (perceptual) events flow *from future through present to past* for any perceiver. We expect events as future, experience them as present, remember and forget them as past. Thus, one and the same irreversible process is represented in two cross-related directions, and still it is irreversible. We experience series A as our life flow, if and only if the world of events flows against it.

So, we have here *relativity of life process demonstrated* and series A explained. The direction of "time" is the direction of a living process against the opposite process of entropy increasing. That relativity is still irreversibility: we can't experience past moments before present moments. The same biological process we experience as a living perceptive time.

2. Life process is not pure, transcendental *time-consciousness*. We never discriminate conscious experience as something detached from body living: "mental and biological lives" flow as one. Husserl concentrates his efforts upon the precise description of the structure of the "time-consciousness" (Husserl, 1928: *Zur Pänomenologie des inneren Zeitbewusstseins*). He draws a line between mental time and phenomenological time as "subjective" and "objective" time respectively, subjects of research, respectively, of psychology and phenomenology; and this is a great confusion. Transcendental phenomenology is distinguished from the psychological experience of time. *Protention*, *intention* and *retention* stand instead of expectation, perception, and memory. This is a purely artificial demarcation.

3. Time does not flow. If time "flows", it must be thought of as an object changing over time. Then we must explain time through meta-time which is nonsense. This objection is well known. *The world flows.* This stream is irreversible like the orientation of perceptive space in the field of vision. The field of experienced time has an asymmetric form: past-present-future. If there were no entropy and no life work as opposite to the entropy process, time wouldn't "flow" for us in series A. That doesn't mean non-existence of time as a sequence before-after (series B).

4. Thus, we have a variant of a "biological" explanation of the time asymmetry in series A just as we have such an explanation of the space asymmetry. We can avoid drawing a line between a realistic phenomenological description and the biological one. Both are just different dimensions of analysis. They are correlated as world and body. There is no pure mental and subjective plan opposed to the physical objective plan. (Gherdjikov, 2000, 2010). This explanation of time experience is in accordance with some basic facts and laws of contemporary science and describes the most significant characteristic of biological life process correlated with the second law of thermodynamics.

Henri Bergson speculates on lived time in a similar sense. There are many places in Bergson's works on time as *durèe* of life (see Creative Evolution: Bergson, 2002: 191).

"The road has been created with the act of travelling over it, being nothing but the direction of this act itself*."* We find here a brilliant formulation of a process of living as time itself. We could find that thought in Chinese Taoism dating from a very long time ago.

5. "The non-reality of time" is *relativity*. Time is experienced from a position of a *flowing "now"*. "Now" is a center of a moving coordinate system, in which we always have future before us and past behind. *Series A is a relation: present is a present only in relation to the future and the past*. This relation is ordered and asymmetric: series A always has the same order. Future becomes present and past continuously. Therefore, these three time categories (series A) do not exist as

such, beyond that relation. The same is not valid for the relation previous – next (series B).

6. "The non-reality of time" still has a special meaning as emptiness of time, timelessness.

Elimination experiment. Let's eliminate the future and past from our experience in a meditation, just de-cogitating memories and predictions. Then "now" is experienced, but, unrelated to "then" (after and before), it vanishes as "now". So, experience of time itself is resolved in timeless emptiness. We experience the "non reality of time". It seems that the same elimination we could accomplish with every structure in our experience. Unrelated is non-definite/ indefinite. We still experience, but there is no time-flow, no structured experience. Here I apply a technique of dissolving from my *De-cogito. Unthinking of the thought-up world* (2007). I find here a new confirmation of my relativity thesis: nonrelated is indefinite.

The Special theory of relativity accomplishes an overcoming of the "absolute time" and "absolute space", which seems to be closer to everyday experience. Spacetime is defined and measured *in reference to the center of a moving coordinate system according to relative velocity*.

7. Time has two modes: *duration* and *sequence*. Duration is defined in reference to change, and vice versa. We have a sequence presented in every observation and description of events following in one irreversible linear order (series B). No event changes (McTaggart). No event changes its position in the sequence. Only distance to events changes from a certain position on the time line. That is a "static time", or more precisely, static time line.

8. Time sequence as *series B seems irrelevant to living process*. Science gives us objective relations and structures independent from life. So, we find an objective, physical process of entropy increasing; an objective, physical process of our Universe's inflation. It is not quite clear if these time arrows are fundamental as laws of nature – physical laws are time-symmetrical. (There is a symmetry also in Bolzman's formulation of entropy increasing.) Time asymmetry is still relative as inter-relativity of physical processes. *We never could observe and describe an absolute Time*.

9. *Time arrows*. There exist *reversible* and *nonreversible* processes. The latter have permanent directions (time arrows). The laws of mechanics are symmetrical in time; there is no time arrow in space movements of bodies. Quantum mechanics is also time symmetrical. Thermodynamics is (partly) irreversible. The second law defines increasing of entropy. (Let me avoid here discussions about this irreversibility). The evolution of our universe is irreversible (cosmological arrow). We have also "psychological arrow", which I see as a product of a "biological arrow". May be the thermodynamic arrow is somehow relative to the biological arrow. We experience the flow of entropy increasing from the living coordinate system, in which entropy decreases. Stephen Hawking defines three "time arrows":

the thermodynamic, the psychological, and the cosmological arrows. He tries to unite them (see Hawking, 1989: 196).

Concluding remarks

Here I tried to analyze and explain *time experience* starting from McTaggart's argument. The thesis which I defended is that series A and B are better explained *as process relations*, and an analysis is provided. I am aware that this thesis is not quite new and unique. But I insist on the originality of my process-relational explanation of time experience.

Series A and B are process relations: asymmetrical and ordered. The *coordinate system of time experience is our body in its life process* directed against entropy increasing. From that position, we first experience previous events, then the next ones, then those after them, etc., and they are ordered in direction past – present – future. From the same position, *in reference to events, we experience a backflow*: we first expect, then perceive, and then remember *an event* in a series: *future – present – past*.

The biological process of re-synthesis (biological arrow) is intrinsically co-related with the physical process of entropy increasing. Both processes are not symmetrical, work of life is dependent from physical laws and especially from entropy increasing. Here a biological arrow is directed against and dependent from a thermodynamical arrow. My formulations and key points of argumentation seem to me original, adequate, and scientifically relevant. Related discussions are too complicated and multidimensional for detailed critical consideration.

The phenomenological description of time flow is not an explanation. We do not know any pure consciousness independent and not correlated with the living body. If such a consciousness really existed, it would not have any time experience.

Time as such does not exist – only processes in relations exist. I suggested some small experiments to demonstrate my main points and to argue against the transcendental phenomenology of "time consciousness". Some related scientific theories and facts were given as confirmations and unsolved problems. I believe, that this analysis confirmed also my relativity thesis about body and world[2)].

NOTES

1. I wrote more on this subject, including on McTagart's view, two decades ago (Gherdjikov, 2000). In his *Philosophy of Time* Anguel Stefanov ordered a set of relevant positions in that area.
2. Hermann Weyl, *Philosophy of Mathematics and Natural Science* (Princeton: Princeton University Press, 1949), 116. (after Stefanov). I was not acquainted with that work in 1995.

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