

From transformations to the notion of time

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Abstract

In this paper I expose an ontological-existential interpretation of time via its unveiling and analysis in an example of scientific measurement in a chemical transformation. I begin with the search for time in the transformation, and little by little I explain its characteristics and structures. I finally interpret the time involved in the measurement and the usual concept of linear time by means of the Heidegger's concept of temporality (originary time). The paper is an attempt to explain Heidegger's existential ontology to non-specialist thinkers interested in understanding the subject of time from approaches different from those of their field, as may be the case of many contemporary scientists. For this reason, it develops the ideas step by step and in an expository way, but gradually entering the precise and rigorous Heideggerian terminology necessary for the temporal analysis. Finally, it should be noted that this work contains novel interpretations of several of the ideas and expressions of Heidegger's thought.

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1. Introduction

This paper attempts to show non-specialists, particularly to scientists, the Heideggerian interpretation of the phenomenon of time, through its elucidation in the analysis of a scientific measurement during a chemical transformation. To gain a very deep, comprehensive, and clarifying understanding of time, it is necessary to place oneself in another comprehensive space different from the scientific and usual one, and the Heideggerian ontology is a very sound option. As we shall see, this has the advantage that we can, so to speak, rise above our activity, for example, measurement, and clarify from a

very fundamental optic not only the time dimension involved in measurement, but with this, our very existence, something that today more than ever is necessary to do. All of this will be carried out by means of a gradual development and as well explained as possible, and by using, as a guiding thread of the discourse, an example situated at the heart of scientific activity, measurement. Although the framework of this work is Heidegger's existential ontology, obviously this basis I use is the development of my interpretation of the topic. For this reason, I have avoided frequent and excessively punctual quotations from Heidegger's work and have rather referenced them in a slightly more general way. The use of the transformation of a substance as a recursive example, and not of movement or displacement, avoids falling into confusion with the phenomenon of space, a problem already noted by Heidegger (Heidegger, 1927b, §19). Additionally, to make Heideggerian ideas and language approachable to non-specialists, this paper is developed in the form of an expository account. Likewise, to heed Heidegger's warning that the phenomenological concept of temporality (sense of being) cannot be grasped through an isolated and blind sentence, a proposition, or a definition in the form of "a result that floats in a vacuum" (Heidegger, 1927a, §5), this paper explains it in section 4 without omitting its necessary elements. The result of all the above is that this paper is necessarily longer than usual.

Inevitably, the comprehensive attitude that must be adopted to really understand this ontological-existential analysis is not the usual one, because here it happens -if I may use a somewhat forced simile- analogous to what happens in science to initiate with the quantum mechanics: we are going to make explicit a reality for which our seeing is not accustomed and, therefore, for which the usual language falls short¹. For this reason, I ask the non-specialist and interested reader for good will, openness and to be very willing to fully read and understand this writing before making a premature criticism from an inappropriate perspective. In tune with this, to facilitate understanding, we must prepare the ground, explain beforehand what the ambit and language of Heidegger's ontology is about and agree on the meaning of some terms and expressions for this paper:

Habitually, on a daily and average basis, we are immersed in our chores, our occupations with things, our dealings with our fellow men, etc., in such a way that our world is familiar to us, and we know how to orient ourselves in it. We "swim", so to speak, "like fish in water" in our environment, oriented, knowing implicitly what to do to live. This everyday situation can be so carefree that, for example, many things we use go apparently unnoticed, or do not explicitly draw attention. This does not mean that we do not understand what these things are about, for we use them, and often do so with great expertise. But this understanding of the being of something in the use is an implicit understanding. Among many other issues, Heidegger's existential ontology posits that it is possible to make explicit the being of something we use, to show it discursively and in its structure as it is given when that thing is in use. This implies that, on the one hand, the one who uses this 'useful-thing' will also come to light as implied in this being of the useful-thing, and on the other hand, that this discursive explicitness can be done without deforming, by the fact of making it explicit, this being. Let us also note that showing something discursively and in its structure is, in a way, to make it the explicit object of our attention, to make it something that is our theme, that is, to show it by "putting it before us", in this case a useful-thing in its use as it is when using it.

On the other hand, at another extreme, it is also the case that things no longer go unnoticed, but rather they explicitly attract our attention and "we put them in front" as objects of our inquisitive gaze, but isolated, stripped of their use. That is,

we do this not to unveil what things are in their use and as they are when using them, but to uncover another mode of being of things, such as, to name just one example, that of their physical consistency. This means that those things that we used and understood in the use, in some way now become incomprehensible, as if we were no longer satisfied with their habitual being in the use and wanted to see them in another way. Or, if you will, under the belief that their only true being can only be determined by considering them in this other way. In this other mode of being things “become objects”, with their own identity. So, for example, in the case of physical things, materiality, substantiality, composition, place in three-dimensional space, physicochemical properties, etc. can be recognized. In short, not only are they made the object of an explicit thematization but stripping them of all their implicit meaning in the use, they are considered ‘object-things’ in themselves, subsistences in themselves, identical to themselves, as floating in the cosmic void, and that together with other object-things, with which they can interact, make up the cosmological world. This way of seeing has been the basis of our present successful science.

With the above we are affirming that the being of things in the use is different from the being of object-things, independently of the fact that correspondences can be established between these two modes of being. This means that there is no such thing as an absolute mode of being of entities, there is no unique being for them, a statement with which many would disagree. It can also mean that the modes of being of entities depend on us, on what they are for us. These points and other implications we cannot discuss in this article. Here we can only indicate that Heidegger shows us different modes of being of the different things of the world and that by unveiling their most fundamental structures it is possible to bring to light, from this system of thought, something as difficult as the issue of time. Science could argue that the object-thing view is correct because science works. This we could not object to and need not do. We could also put the evidence that, following our example, using something also works and there is undoubtedly a kind of understanding therein, and that in fact this must be prior with respect to the act of seeing things as object-things, for example, long before doing science. Science could argue that the fact of using something could also be explained scientifically, with mechanisms of object-things. But this is not really an objection, since unveiling how we really see things when using them does not conflict with another explanation of mechanisms of science. The question is to decide what ambit one wants to reveal, and whether one or the other way of seeing being truly encompasses the whole phenomenon one is trying to unveil. It is undeniable that science works, it shows us in a certain sense how things are, and it can modify our world, but this is not the issue. The issue here is whether there are other modes of being of entities, whether they can also be unveiling, and perhaps be so encompassing that, although they do not modify our physical world, they reveal to us such difficult matters as what we truly “see” in existing, which includes clarifying the issue of time. Having said this, let us make some considerations regarding ontological-existential language.

In the field of existential ontology, the term ‘entity’ denotes everything that ‘is’ and has a ‘mode of being’, even if it is only something imagined. For example, entities are the bodies of physics, the chemical elements, the energy, the movement, the cells, a friend, a process, an occurrence, a historical event, my pet, a pain, a joy, the utensils, the room, this door, a plant, an insect, the geometric objects, this physicomathematical model, the gods, an idea, a ghost, ourselves, etc. Negatively, we also speak of the ‘non-entity’, of what is not, and in its extreme form, of nothingness.

Habitually, when we interpret an entity, we do so with a view that understands its more fundamental being as reality/unreality, and we refer to it as a “thing”, as an object of our consideration. We look at it, as if pointing to its identity, to its sameness, among other sameness, as a thing among other things that fill the world of things. That is to say, without noticing it, we turn it into a thing-object, of which we spoke above, although it may or may not have physical reality or be animate or inanimate. Technically, it is an entity in its ‘being-there-objectified’, or ‘being-there-present’² to our gaze, which in a certain way isolates it (although it is with other things), with its ‘objectified-presence’. We will refer to this mode of being as ‘being-there’³.

Being-there is the mode of being based on which we often even interpret ourselves, and we “use” it very widely when we do science. For example, when we study the interaction between two objects, we see each one precisely as an object with its identity that can be next to the other, also with its identity, in mutual relation through the presence of another thing with its identity (the interaction). We also use the being-there to a large extent when we simply make an explicit description of the entities of daily life, or events, which is a daily and average “natural” explicit interpretation. This mode of comprehensive interpretation of being is also called an ‘ontic’ interpretation since it points to a habitual way of referring to the entities of our life. However, as we have mentioned, there are other ways of understanding the being of entities. They are not usually brought to the fore in explicit interpretations expressed through speech, but that are used in an implicit way in daily living and daily orientation, that is, they are implicitly understood. For example, we do not understand ourselves, in our daily living and orientation, as an object-thing, but we understand ourselves as ‘existence’. We exist, and that implies that we live immersed in a world of meanings, and that we understand the being of all entities, which implies that we understand our own being, being that, at the same time, matters to us. In addition, we are such that we understand that in each case (I, you, he, etc., that is, from the existence of each one) this existence is always ‘mine’. This way of understanding being is not captured by isolating the person as if it were an object, as a thing with properties, but by revealing an inexhaustible totality that cannot be seen as a unit of parts or objects. For Heidegger’s existential ontology we exist submerged in being and that is our “reality”. This means that also when we do science, we do it from this inhabiting the being, from existing, existing that is always mine in each case. Strictly speaking, this being submerged in this world of meanings from one’s own existence, this “opening of meaning from me”, cannot be explained with ontic mechanisms of realities. Or if we venture to make an ‘ontic-real’ explanation of the mechanism that originates this result of “our living in the meanings and always from each me”, of this “my inhabiting the being”, this explanation, justified under certain limits and with an unquestionable practical utility in science, is not truly capable of covering all this phenomenon. In addition, it is an explanation that, although natural, is only situated in one of the possible ways of understanding being, otherwise, derived from other essences. Indeed, as we will see, the way to understand being as being-there is not really the primary one, but requires a special attitude that, although we easily reach it, is rather derivative.

On its side, the more essential “world of being” can only be described in its structure with great difficulty and with a resulting discourse that may seem strange (but at the same time familiar), since almost all language and the usual forms of argumentative explanation are built from relationships that are interpreted as ontic. To explicitly account for the being itself of entities and to explain it in predicative statements is something we do not usually do and for which, in part, there are no adequate words or complete discourses. To bring out explicitly this sort of “world of meanings” in which we orient

ourselves and are immediately and implicitly submerged (Being), is also an attempt to objectify and structure it, and when we succeed in doing so, the result looks like a certain 'being-there-complex'. The "images" and the story that are revealed may even seem mystical or poetic. It will also seem that the language has been violented and suffers from redundancies, a sensation that worsens if we do not really understand its meaning. These observations will be given and in a certain way cleared up as we progress, at this point it is only necessary to emphasize the necessary special attitude that must be put to try to understand the existential ontology for the interpretation of time shown here.

The unveiling of the structures of being itself of entities as they are, is what is called 'ontology'. So, ontology is a structured predicative discourse on the being itself of entities as they are. In contrast, an explicit discourse that only describes entities in a habitual way or that establishes their formal entitative relationships (as in some scientific fields) is an ontic discourse. We will see that the theme of this article, time, can be understood and explained as reality, as being-there, or also from a more fundamental perspective related to the ontological at its very root.

In summary, being corresponds to the being of the entity. The entity is always such from a certain mode of being. We cannot deal with the entity except "through" being. All our orientation in our living occurs on this sort of "floor of meanings" (which sometimes includes the nonsense). But this does not mean that we live in the explicit concept of being, that we have made it an object in its true structure, and that we have a predicative discourse about being in our daily lives. On the contrary, what is common is to be "swimming" in the implicit meaning without clearly realizing it, without objectifying and conceptualizing it in its wholeness. The preconceptual understanding of being, implicit understanding, which does not occur in an ontological analysis, but which is crucial to exist and guide us daily, is called 'preontological' understanding. It is the basis to consider carrying out any *a posteriori* ontological analysis. In addition, as we have indicated, we can understand the same entity from different modes of being, although there is a more immediate and fundamental mode of being for each entity. Additionally, from the above it can be inferred that entity and being are not the same, although they are fundamentally related. The dichotomy between entity and being is what is called the 'ontological difference' in Heideggerian thought.

In this work I have used and will frequently use these terms: ontic, being-there, ontological, preontological, existence, existentiell, existential. The meaning of the first five have already been outlined and them should be remembered throughout this paper, though they will also become even clearer as we go along. 'Existentiell' here means everything related to our pre-ontological understanding and behavior as existing entities that we are (and not as being-there). 'Existential' denotes that relative to the structure of being of existence which is made explicit in an ontological analysis of the existentiell behavior or pre-ontological behaviour.

This writing will begin with an ontic discourse to gradually move to an ontological one. This means that we will necessarily get out of "usual reality", to put it in a certain way. But where we will leave is what, without realizing it, we move at all times. We permanently exist in a kind of complex network of meanings, but it is not a network of things, but of being, and that is what we will show. That is why it should not be understood as if we were talking about an ontic mechanism, which can be ontically refuted. Nor is it correct to understand it as if we were talking about a world of appearances, or subjective, or representative, where what is truly real would be the physical world and its underlying mechanisms. At this point it is

necessary to indicate that in this paper it is not affirmed that the foundation relations at the ontic level of science, based largely on understanding being as being-there, are unreal or incorrect. We will and will continue to make scientific discoveries and gain guidance and transformation in our way of life from them. That is not the point here. The point is to reveal the general ontological structure that includes other modes of being in which we move at all times. For this reason, it is a task that, in principle, does not have implications for science, but rather gives a greater vision and existential orientation to the scientist who is interested in understanding it.

In relation to this, without our realizing it, we exist thanks to our structural background of time, which explains, for example, that we understand everything related to the temporal. In this writing we will do the exercise of “remembering” this structure, like someone who visits again, but “consciously”, a forgotten place and returns with the story of what has been seen and tries to describe it in an orderly manner. Consistent with what we have said, we will see that this paper is not trying to reveal what time is as if it were an entity, nor its mechanisms as a physical structure or process. It is not a question of showing time in a presumed structure of things and in relation to other physical things, it is not a question of showing the physical secrets of time, that is, we will not contribute to a supposed development of science in this sense. Nor is it a question of exhibiting the psychological structure that gives rise to the sensation of time. Rather, it is about exhibiting, approximately, something as the structure of meanings in which we always “live” in relation to time, and this necessarily means explicitly revealing the ontological structure of existence. This is not a minor or alien thing, because I repeat, this structure occurs *a priori* in everything we do when we exist, and this includes dedicating ourselves to science.

2. In search of time

Where does time appear? “Obviously, in everything we do, in what happens to us, in the world, in the universe, in life, in nature”, we reply. Our actions occur in time, as well as events, processes, movements, etc. “The hours go by”, “the days go by”, we say. “Before I was a child, now an adult, later I will be an old man”. “Yesterday I spent time with my dear friend”, “tomorrow will be another day”, “Now is the time”. “I cannot remember my future”, “A moment from the past and one from the future cannot be simultaneous”, “time passes from the future to the past, through the present”. Our language is full of words or phrases that denote or refer to the temporal: “always”, “permanently”, “daily”, “it happens”, “we have been”, “event”, “quiet”, “change”, “fleeting”, “eternal”, “timeless”, “supratemporal”, “later”, “after”, “a while ago”, “before”, “now”, “at this moment”, “past”, “present”, “future”, etc.

In the same way as it happens initially with all patterns, for example, with the pattern of length, we have established our references about time with respect to our habitual experience. The second, the minute, the hour, the day, etc. are related to the time lapses in which we usually move, of what we lived in our affairs and common needs⁴. Agreed and shared references, related to the experiential. Regarding them, the times of large-scale processes seem very difficult to size up. Science shows us that life on earth is about 4,000,000,000 years old. (Deamer, 2011). Science also estimates that the universe would be about 13,700,000,000 years old, or at least it has been expanding for that long (Hawking, 2005). The enormous spatial distances in the cosmos are also measured in years, but with respect to how many years it is necessary to travel at the speed of light to cover them, considering that the speed of light is constant in a vacuum. Velocity, which is

the change of some characteristic per unit of time, is usually used intuitively as an appreciation of time, since something faster takes less time and something slower takes longer. In chemistry, the rate of a reaction is established by measuring some changing property of the reactants or products over time. For various reasons that we are not going to detail here, chemical reactions can have different rates. There are relatively slow chemical reactions or physicochemical processes under ambient conditions. A typical example is the oxidation of the surface of a piece of metal such as iron by immersing it in water. However, chemical reactions are usually fast. For example, another metal, potassium, when immersed in water at ambient conditions reacts very quickly and explosively with the production of highly visible hydrogen gas. At the atomic-molecular level, chemical reactions are redistributions of electrons and nuclei, processes that occur incredibly fast when the conditions for transformation to occur are given. Frontier research in physics and chemistry at the time of writing this article has been able to record, film, and even control these types of events for individual molecules and atoms (He, 2022; Xie, 2014; Zewail, 2016; Borrego-Varillas, 2022). And here we return to name the ability of science to show us unimaginable numbers. These events occur in extremely short time intervals, on the order of femtoseconds (10^{-15} s) to attoseconds (10^{-18} s), since nuclear and electronic movements occur, respectively, on these time scales, and we currently have molecular excitation and detection instruments that can operate at these time scales (Midorikawa, 2022; He, 2022; Xie, 2014; Zewail, 2016; Borrego-Varillas, 2022). To get an idea of these magnitudes, think again of the age of the universe, which in seconds is roughly just over 4 followed by 17 zeros. Therefore, one attosecond compared to one second would be like comparing about half a second to the total age of the universe. An even more incredible feat of humanity in its ability to measure time: the measurement of the delay interval between two moments of electron density output in a photoionization event (Grundmann, 2020). It was possible recording 247 zeptoseconds (1 zeptosecond = 10^{-21} seconds) which is the time it takes for a photon of ionizing light to travel through a hydrogen molecule along its bond.

All this shows us that we are capable of impressive milestones with respect to time. Humans are the lords of time. But what is the time? We shrug. We know how to govern ourselves by it with great quantitative accuracy, but we do not have such an answer and, usually, not even a clear discourse about the essence of time. We have mentioned the speed of the processes because we suspect that time has to do with change. So, in the search for the meaning of time, we can start by inspecting the change. One of the exemplary phenomena of change is movement or displacement. However, the problem with looking for time in displacement is that it implies a spatial magnitude, and this brings the danger of confusing ourselves with space when looking for time. So, in this paper we will go in search of time in transformations, and, initially and in particular, in a hypothetical chemical transformation.

Take for example the kinetic study of a relatively slow chemical reaction, where the researcher measures the concentration of one of the products as the reaction progresses. For this we need the chemical reagents, a container, a stopwatch, and a measurable characteristic of one of the products of the reaction that varies with its concentration. At the beginning, when we put the reagents in the container, we mark zero on the stopwatch. The reaction has then started, and the appearance and gradual increase in the concentration of the product is recorded as the mark on the stopwatch advances. With the reading and recording of each concentration in conjunction with its corresponding time, we achieved two correlated variables. One of these variables is a reference pattern, the stopwatch time, which “contains” an

unalterable unit of time measurement, which is repeated continuously and is the same for everyone. From this correlation it is possible to extract, for example, the reaction rate equation, and in general, to study other aspects of kinetics. But this procedure is the use of time and change, that is, of things we take for granted and somehow understand, to carry out one of the most distinctive activities of science; measure and extract relationships. Time is accepted here as one of the *a priori* of reality, which we could understand as having a category like those of the fundamental entities that science encounters, such as, for example, space, matter, motion, etc. They are accepted, so to speak, axiomatically. In this sense, science would consider it superfluous to ask about them: they are accepted and relations between them are found when it is appropriate to do so. This means that it would not be possible to study its essence within science, but that this would belong to other fields, such as philosophy. Also, science could consider that such an essence of time is already somehow clarified, and here we immediately think of the theory of relativity and others (Hawking, 2005). However, the supposed unquestionability of time, or the supposed essence of time in science, in many cases does not even convince the same scientists who are knowledgeable of matters about time, and, without a doubt, there are other perspectives different from those of science. The essence of time in a special ontological look may or may not be useful to science, but it is a discourse that can dialogue with a prominent part of science and with other forms of human seeing and that can lead the scientist to see more beyond his discipline. For these reasons, let us continue our search for the meaning of time in our example of a chemical reaction investigation. Where do we find time? An answer from science: time is what the stopwatch, the clock measures, therefore it is in it. But we also find time in the chemical transformation itself because it is change and change requires time. Moreover, if we assume that it progresses regularly in some lapse of time, it itself can function as a clock: with its progress and recording of concentration, under certain specific known conditions, we can measure the progress of some other physical phenomenon, or even a daily event. So, for now, let us abandon all proper instruments of time, such as the stopwatch, and focus on the transformation itself.

Where do we find time in transformation? Is time a real entity in the transformation, is something external, or maybe something subjective? Is time in the transformation or in me, or in all of us? Let's go gradually. By following the change in concentration, we know that time is neither the reacting substance nor the product nor its component molecules nor the changing concentration nor the transformation itself. The net transformation that we observe could cease when a reactant runs out, and time would continue to tick. Therefore, time is not the transformation, or at least not the net chemical transformation that we look at, although we continue to know that this transformation, in order to be such, is in some way or another "composed by time". What if, suddenly, all "external" transformation in the universe stops? In such a case, my mental and psychic processes would remain, my consciousness. Once again, we return to the feeling that I am time; it would have to do with my mental processes. On the contrary, if my psychic processes stop and the processes of "external" cosmic nature continue, would time continue to exist? Something tells me that if I, for example, cease to exist, time continues to run, at least that is what experience indicates me about other human beings: I see that time already existed before they were born, or that time keeps ticking when they die, which would also apply to me. This is so unless I am different from the other human beings. Whether or not I am different from the other human beings is a matter that we cannot discuss at this moment, although it is a subject that in a special way is incorporated into the discussion later in this writing. For now, accepting this evidence that I am one more like other humans, we would have that the last reasoning leads us to formulate that time is then "out there", as it is also in our mental processes. This would also lead us to assume

that natural processes, and with them time, continue to happen, even though no consciousness exists to witness it. But if everything stops; the other humans, the other living beings of whatever type, the consciences, the processes of the universe, myself, is there time? Something tells me no. Or that, rather, it could not say that there is or is not time. I could not say. So, as we continue to exist in this world as it is, it is not wrong to look for time in the processes, in the changes, whether mental or some “external” process. But our chemical reaction is an example of change, and we suspect that this change involves the time.

Is time an ambit of the events? A kind of receptacle for the events, processes, transformations, movements, etc.? Does time contain them, or do they contain time? As a field of the events, is there an absolute time? Within science, the theory of relativity states that there is no privileged frame of reference for the measurement of time: it depends, for example, on the state of relative motion of the observers (Hawking, 2005; Einstein, 1916). For an observer who moves at a speed close to that of light with respect to another who is considered to be at rest, the time interval marked by his watch will be different from that of the observer at rest, when measuring the beginning and end of the same event. The same will happen with simultaneity; the moving observer will determine that a pair of events are simultaneous, while for the one who is at rest the same events will not be simultaneous. The same desynchronization is observed for two different clocks located at different distances from the center of gravity of a body of great mass. (Khabarova, 2022). And then relativity tells us that time is a fourth dimension tied to the other three spatial dimensions. We talk about space-time, and the consequences of relativity, for example, that relativistic effects in massive chemical elements can affect the chemical reactions in which they are implied. And so, we see time abstractly as a timeline, as a geometric object, as one more of the one-dimensional lines, and as an object susceptible to measurement. However, both in the non-relativistic case and in the relativistic one, in which we speak of the frame of reference of time, absolute, relative, simultaneity, etc., we have not yet inquired into the “essence” of time. What does it mean, for example, before, after, now, time span? We continue to use past, present, and future, and keep talking about more or less time. We keep comparing time spans and talking about one event happening before or after another. And, meanwhile, we say, our own life advances in time, passes in time, and we also say that time passes. We suspect that we have not yet fully immersed ourselves in the fiber of time.

We say: the chemical product of this reaction had a lower concentration 5 minutes ago, but 5 minutes later it will have a much higher concentration. Had, has, will have; we talk about past, present, future; before, now, after. When we think about the characteristics of what was, we say that it is no longer, but that it was. That ‘now’ is no longer, it is no longer currently. When we think about the characteristics of what will be, we say that ‘now’ is not yet, or that it is not yet that ‘now’. When we think about the characteristics of a current ‘now’, we say that it is, “at this moment it is”. This means that we think of the ‘before’ as what is no longer, we think of the ‘after’ as what is not yet, and we think of the ‘now’ as what it really is. We understand the current, the ‘now’, as what really is, what actually “exists”⁵, as a being-there in fact. We understand the prior or past as what no longer exists in the sense of what is not a being-there as such. The future as what is not yet a being-there. The concentration is no longer what it was and is not yet what it will be. We could repeat the reaction and find the same concentration in another determined now, but it would not be accompanied by all the rest of the events in the universe as they were; for example, the same date is not updated again. The complete punctual now is unrepeatable. I am no longer the child I used to be, nor am I the person I will be. And thus, we determine time from the

criterion of what exists in the sense of what is real, a being-there; and that, in this way of understanding, is the 'now'. The past is a 'not-now', a kind of nothing. The future is a 'not-now', another kind of nothing, non-existent in the usual sense of the expression, as something that is not current, a non being-there. It seems that all there is, is the now. But what is the now? When we follow the concentration of the product, it is as if the now were following the current concentration, it is as if it were accompanying it. It is as if now (and time) were something, an entity in its being-there. We say, time itself comes and goes, just as an event or a thing comes and goes, which appears before me and then disappears. As if time itself passed in time, which would denote an error in reasoning. A higher concentration is not in my now, in my now there is a lesser concentration with respect to what is to come. A concentration greater than the previous one is now such a concentration, the concentration is no longer that concentration that it was, it is already another, higher one. But what is the now? The concentration that comes and goes, comes to me, and leaves me. And when it arrives it is the concentration 'now', actual. Am I the now? (Heidegger, 1924) The now that always follows the current concentration? Am I the present? And how is it that I can talk about myself; Am I the now for the now? Am I time for time?

But are the past and the future absolutely one nothing? Are they not, rather, a different kind of now? Which is the presence of the past and the future, so present that I can talk about them? So, am I the past, the present and the future "at the same time"? Could it be that we should not see what time really is as something that 'is-there', as what is-there "in front of me", "appearing before me" in some way, as what remains, consists, delays? Could it be that myself do not understand myself as only being a thing that is-there? It seems that time is not an entity, even less an entity that is-there, that appears before me, as a thing. However, in science and in our everyday life we see time as something abstract, a linear time consisting of points after, now, before; a now not yet, a now, and a now no longer. Furthermore, in accordance with what we have said, each now is a now, which, "at the same time", is a before, and "at the same time" is an after. Each now is a point that also contains the presence of a 'now not yet' and a 'now no longer' (Heidegger, 1927b). Each point is earlier with respect to another that is later, and this, in turn, is earlier with respect to another additional one that is later, and so on. So, from this point of view, it seems that each point in time is the same as any other. They are not distinguished from each other, they are homogeneous. By joining each point and seeing them together we get eternity, the infinite number of nows that follow one after the other, endlessly and without gaps. We can also see it abstractly as a geometric line. We then obtain the timeline which, as a geometric object, would be timeless in itself, would not be in time. It allows us to relate its points with other variables to find relationships that we can embody in, for example, logical-mathematical relationships in science. Time is thus an abstract and fundamental entity. On other occasions it seems to us that it is an entity that is-there, something that partly goes, partly comes, and partly remains, as if it were itself in time. But it is also given to us as being very significant; "time has gone by", we say, "we still have time", and in my now we mention or express these presences. And we continue, tangled up, trying to untangle the tangle of time.

3. Characteristics of usual time

Let us penetrate a little further into the preontological plane to show it gradually. It is worth remembering at this point, and keeping in mind throughout this paper, that we are trying to bring out explicitly and gradually what truly means for us, what

we truly see and experience in its being and in its structure of being, when we “experience” time in our daily existence. This means that we do not look for a supposed physical mechanism underlying this experience of time. This last look is a usual comprehensive interpretation that sees time as something that is-there, that is, that limits and conceals its original structure by framing it in a single mode of being that is not really the primary one for this phenomenon. What we say in this section is preliminary and will make full sense later.

Having said that, let us take up once again the course of the series of concentrations in our experiment to see from another angle related to the one already highlighted. A lesser concentration than the current one is not just any concentration, but rather a prior concentration in time. A greater concentration than the current one is not just any concentration, but a later concentration in time. When following something in time we must add these expressions; before (prior, earlier), after (later) with respect to a now. According to Heidegger (Heidegger, 1927b), Aristotle envisioned time as a “counting” in the monitoring of a change that is found in the perspective of a temporal before and a temporal after. By following the changing concentration in each now; we say or number, with or without words, the now of this concentration. But each now is something like the first now of the future and the last now of the past (Zubiri, 1976). For this reason, the now that we express, that we number, is in the realm of the past (before) and of the future (after). Somehow the now is, at the same time, beginning and end: each now contains, in some way, all time. According to this, the flow of points would not be the union of infinitesimal points as an infinite geometric line. Both by numbering a now in the reading of the concentration, as in the stopwatch, we provide in each case a now in the perspective of a before and after. But when we consider a before and after from a now, we realize that, in its meaning, we are in the midst of a transit of time, of a pass that extends to a certain extent. The now itself has a ‘spannedness’ that is only possible if we are already in an ambit of a before and an after temporal. So, according to this, the time that we register in an event, or in the clock, is spanned in itself.

On the other hand, we have also said that time is something like an ambit of the events, which somehow contains the processes, embraces, or encompasses them. A process or event is understood in a certain way from time. We say that the event is ‘temporal’ or ‘intratemporal’, in a certain way. The process, to be such, is joined to time and we understand it that way, as temporal. We understand something temporal as being in time, which is why we asked ourselves, above, whether or not there is an absolute time from where we consider events. It seems that we understand through time: we say, “it is temporal”, “it is eternal”, or even that “it is timeless”, or that “it is supratemporal”. That is to say, also we understand from the time what “does not pass” in time, for example the abstract, also what is at rest, etc. Somehow, we also understand every entity from time. Moreover, since ancient times, humans have wondered about the ultimate reality, about what is truly real. What is really in the universe, what is real? And in the question and in the answer, we orient ourselves towards the essence, what truly is, what, in a certain way, remains, what is stable, what lasts (Heidegger, 1962), what is-there permanently, what is underlying, what which always is. The immutable building blocks. That is, we understand the ultimate reality, in the sense of what is constantly. In other words, we understand it temporarily. In this mode of understanding being as being-there, time serves as a kind of reference structure for our understanding and search for the truly real.

The other characteristic of time, already mentioned in the previous section, is that it is understandable, articulable, and

expressible, with or without words, by anyone to a greater or lesser degree. For example, in general, oneself and everyone understands (or can come to understand) what the expressions “always”, “permanent”, “timeless”, “ephemeral”, “now”, “before”, “after”, “present”, etc. Another example, both scientists understand that a certain mark on the stopwatch occurs simultaneously at a certain concentration and, in general, we can make use of time, and express it with or without words. It seems that we are temporal beings, we have “unfolded” and we always “unfold” in time and for this we must understand it, at least implicitly. Then, we can highlight that time has the ontological characteristic of being ‘public’, that is, to a greater or lesser degree, it is articulable by anyone and understandable in some way by all of us. This character apparently has nothing to do with time itself, but with a characteristic alien to time and more related to its collective understanding. But we will see later that time, in its fundamental meaning, is not something to be apprehended by collective consciousnesses, but that it forms something like this collectivity itself.

When we interpret time in its most abstract form, as linear time, or timeline, formed by infinitesimal time points, aligned next to each other, we give only an abstract objectual look (but, by the way, very important in science and its development), which means that we must necessarily leave aside, forget, or not realize the ontological characteristics of the time of our usual daily occupation: that each point now is not a geometrical point, but spanned in itself, “during this fraction of a second”, “at this hour”, “this year”, etc., for each now carries in itself in some way the past and the future; that time is involved in the understanding, that it encompasses entities, processes, etc.; that time is ‘public’, understandable, expressible, communicable, and by anyone; and that with it we ‘date’. This last characteristic is very important and typical of how we understand the usual time of the daily occupation, of the time that we spend in our chores, carelessly, without necessarily analyzing the time itself, of the time that we use in our immediate and average daily life. But, obviously, also from an activity not as ordinary as the scientific one: technically dating, registering a mark of time, expressing it, writing it down, for each experience of the changing concentration of our experiment.

Let us show the characteristic of ‘dating’ by means of our example. When registering a concentration and the time of that concentration, and the simultaneity of both, we articulate, with words or not, “now that this concentration”, “that this hour”, “that this simultaneity”, “that this record”. Likewise, I can say, for example, to my colleague, “an hour ago when we read such a concentration”, “the one in which we got distracted and from which we were not sure”, “well this or that happened...”. Likewise, “two hours later, when it gets dark, the concentration of this or that reagent will probably run out”. “Later, when...”. Then we realize that we are dating: “an hour ago”, “when it is 5 pm”, “at this time”. But we don’t necessarily date with the mark of the stopwatch or the clock. For example, going back to the case of replacing our watch with the concentration reading, we are dating with this concentration: “now that this concentration”, “later, when the concentration is such and such”. Even more, by expressing, “a while ago, when we weren’t sure and this or that happened”, or “later when it gets dark”, we are dating by means of an event that is not a concentration (“...when we weren’t sure...”, “...what happened this or that...”, “...when it gets dark...”). This reveals that in our average daily life, before dating with an exact, quantitative event, before quantifying time, we already date through events that we can express or simply mention: “now that it is cold”, “the next hot summer”, “when I was a child”, etc. When dating we are ‘articulating’, expressed in words or not, a situation that occurs in some present, a present that can also be the present that will be in the future or that was in the past, both ‘articulables’. We are ‘presentifying’, interpreting an event and, at the

same time, interpreting ourselves in that presentification.

Let us now show the characteristic of time of being ‘encompassing’ of entities (‘understanding’) from another modality of being, somewhat more original than that of being-there that we have already delineated above for this aspect. Here the same warning applies as in the case of the public character of time, since it will seem that what we are about to indicate has no direct relation with time itself, but that it is something extraneous, but we will see in the following sections that it does. When we understand a temporal process, for example, our chemical transformation experiment, we always understand it in relation to a ‘referential complex’ of chained “things”⁶ in which ourselves are involved; this makes it possible for it to be given to us as such. It happens, in a preontological concatenation it ‘signifies’, it ‘affects’, no matter how abstract, indifferent, and independent it may seem. It signifies and affects so much that it is somewhat difficult to make of it a special, technical, cold, mechanical, calculating study, as in the case of a scientific study. Significance is a part of understanding and implies, as we shall see, also that it affects. For now, let us go by parts and try to glimpse this ontological-existential structure by one of the possible paths provided by our example of measurement. When we take the stopwatch and say “now”, “just at this time mark”, we see that this now is appropriate or inappropriate for the reading of the concentration, for an annotation or not in the data table, to be able to complete the table and the experiment,..., to, in the end, fulfill a possibility of our being (our desire, the realization of our scientific being, etc.). In other words, in doing the reading of time we are not in time itself as an abstract object of our analysis, but somehow, we dispose of it, and we escape into another thing. In its meaning, with the “now” we move towards concentration and towards the simultaneity between measured time and concentration, and towards the data, the context and framework of the kinetic study, the instruments, in the ambit of the room, in the middle of an experiment that must go well with my colleague to correctly perform the study,..., we are referred to the scientific community and others, to realize ourselves professionally, to fulfill our work, and our needs and desires... But also, implicitly, so that the research can serve others and, eventually, the study can contribute to development, etc. To realize ourselves professionally implies a place in society, also salary retribution, satisfaction of basic needs, food, housing, and satisfaction of also non-basic needs, welfare, permanence, and legacy. Useful knowledge for society to develop, to remain, to transcend.

We see in this an intricate chain of simultaneous referrals that occur implicitly; this leads to this other, to a for what, to a for this, etc., and in the end towards a for what which is a ‘for-the-sake-of’ myself or of humanity itself, that is, it ends in this or other way of being mine, of us, etc. Even if the explanation of this central ontological structure with which we understand and its relation to time is still insufficient, we must indicate that it is what we will call ‘significance’: a complex of references of the “for this”, “for that”,.. ‘for-the-sake-of’. This structure is what constitutes what we shall call ‘world’: time appears as having, in part, the structure of the world; and this world is not here an ontic world like the cosmos or the totality of things, but something like a “world of signification”.

So far, we have shown that, in a first ontological outline, the time that we find in following the transformation, the implicit or preontological time, that is, before objectifying it or to look at it explicitly, has the characters of being of the spannedness, publicness datability and significance. We have also mentioned that these characters are general in every act of taking time, giving time, occupying time. This includes the usual time reading on the clock. Now, we ask ourselves,

why does the clock itself have to do with time? The clock is based on a process, a change, for example, the regular and cyclical movement of its hands, based on a mechanical or electronic process. Being regular and cyclical seems to have to do with time, or rather with its usefulness to measure time, since by the mere fact of being a process it must already have to do with time, as we have seen. But this clock is based on, agrees with, or synchronized with natural clocks, with governing us by time and giving us time in our daily chores by making use of a calendar-astronomical reading. The most familiar and natural is to govern ourselves by means of the rising and setting of the sun, the sunrise, dawn, zenith, night and its interludes. In this process we might appreciate, perhaps more natively, the characteristics of the usual time already highlighted. We say, “early in the morning, when the sun will rise, I can start the experiment”, “when the sun rises, I can go and get the materials for such and such a task”, etc. Then we date by means of sunrise, an event that allows us to see in the daylight, to orient ourselves better, that makes possible the functioning of a daytime store, etc. Firstly, sunrise is an event that is undoubtedly public, that one and all those involved understand and use, that in its periodic regularity allows us to agree and synchronize. The time in the sky appears as accentuatedly public because it is strongly binding. We can all give and occupy our time differently by dating, in this case, and in the case of synchronized clocks, in a common way. This is different from dating by means of a private event, individual and different for each one, but in which we can all say simultaneously ‘now’, and understand what we say; “it was at the moment when I noticed the stain on his jacket”, etc. Secondly, this dating is a ‘presentification’ of an event, the rising of the sun, which is in connection with the clarification of the day. In this presentification we let the sun, the light, other surrounding entities, etc., come to encounter us in their being⁷. But with it, we interpret these entities, the fact of being amid them, and we interpret ourselves. But in this preontological network we are also immersed in a very special background of past and future, which will be explained below. Thirdly, in articulating: “when the sun rises...”, we interpret a future now from a present now, that is, in this expecting the future now from the present now, a meanwhile is configured, a lapse of time that has a certain duration, extension, and we say that time is extended, tense, stretched, or spanned. This span, in turn, can be further subdivided, and is also, itself, datable, a fact that is articulable with a “while this or that”. As far as its being is concerned, each before (past), now (present) and after (future) of our usual busyness in which we give ourselves time, is also spanned: “yesterday while measuring”, “this second, while it changes color”, “at 5 pm while we are settling in for the meeting”, etc. Fourthly, in articulating: “when the sun rises I can will be able to go and get the materials for such and such a task...”, “it will be time for such and such a thing”, etc., we recognize the structure highlighted above and which we designated as significance: a complex of references of ‘for something...for this,... for-the-sake-of’, which we said constitutes the ontological structure of the world. These outstanding characters of time we count on, by which we are governed in our daily medianity, of the ‘time’ we give ourselves, are more understandable in their being from a presentification that ‘expects (or not)’ and that ‘retains (or forgets)’. The meaning of this, the clarification of what we have been able to wrest, very provisionally, to the being of usual time, and the ultimate meaning of time, can be achieved if we now show the ‘originary time’ from the ontological constitution of human existence.

4. Our being and originary time

As we saw, the being-there is the natural mode of understanding and interpreting being explicitly and, in part, implicitly. It

comes as an inevitable consequence of having to deal with the entities with an emphasis on presentifying. Its extreme and technical form is an interpretation in which we see ourselves as “living” in a world of mechanical interaction between entities that are-there, where we ourselves are biochemical machines, and, ultimately, a reality of more fundamental physical entities. However, without explicitly realizing it, we implicitly understand and interpret, and thereby orient ourselves and deal with everything, including ourselves, by means of other more original modes of being. They always “operate”, even when we do our science that objectivizes entities. In this section, we will briefly exhibit them and show their underlying ontological structures, thus exposing the implicit comprehensive picture and originary we have of our existence and of time.

On one side, the entities with which we have dealings in our daily life we will call useful-things⁸ (which includes also useless things, those that are indifferent to us, etc.), since we understand them preontologically as having the mode of being of ‘being-at-hand’ (which includes also that they are not available in the vicinity, or that they do not belong to us) and we orient ourselves in a ‘circumspective’ gaze between them and our occupations (Heidegger, 1927a, § 14). We deal with them based on the understanding and interpretation of this mode of being without explicitly thinking or explaining it, but in a circumspective use and orientation. With respect to its ontological structure, a useful-thing is not given as isolated, but in relation to a whole set of useful-things, where each one refers in a different degree to others. That is to say, ontologically, a useful-thing is given being in mutual ‘respective condition’ with other useful-things. The stopwatch is in respective condition with the hand, with the force applied in operating it, with the light..., with the room..., with my colleague..., with the measuring of time, and this with the measured concentration and the synchronization of both, and so on. Let us recall that these related chains of ‘referential complexes’ are part of the significance, the concatenation of the for...for this..., for-the-sake-of that constitutes the ontological structure we call world (Heidegger, 1927a, § 14). To this we shall return below.

On the other hand, we understand ourselves as entities with a mode of being different from that of other entities. Preontologically we understand ourselves as ‘existence’. Existence is not used here in the sense that we have assigned to the being-there, nor only in the general fact of being, but in the special sense of ‘ex-sistence’: ‘Ex’ denotes something like the ontic-ontological ‘open space’⁹ towards which we “constantly” going out, and ‘sistence’ denotes something like ‘to be being’. So, ex-sistence would be some as ‘to be being “permanently”’, and in a certain way, the ontic-ontological open space’. In this work, ex-sistence corresponds to the German word [*Dasein*] (*[Da-sein]*), which literally translates Being-there. The ‘There’ [*Da*] is that open space “made” of ‘sense’, to which we are always consigned, also called ‘disclosedness’. Hence, that Being-there consist of to be being the disclosedness (the there). Ex-sistence is radically not closed but consists fundamentally in the ‘clearness’ that gives us Being. We are enlightened, clarified in ourselves because we are meaning and significance (a phrase that includes the nonsense, the countersense, or the insignificant and not comprehensible, etc.). We consist in this “awakening” that is existence, in this ‘being permanently opening the disclosedness’, and being opening it in a certain way. It is necessary to clarify that the expressions ‘going out’ and ‘opening’ do not point to ontic acts, do not lie actions, nor an ontic creating or originating, but to be being constantly the sense, the meaning, the awakening itself, or more accurately the fact that my being is radically involved in the Being itself. To be clarified or to be our disclosedness, not only implies that we understand in some way the being of every other entity

that is not us, but also that we understand our very being. We always find ourselves in a certain way and we know in one way or another what is going on with us. As long as we are, we are not indifferent to our being. This understanding ourselves and feeling ourselves is preontological, existentiell, preconceptual, independently of the fact that it can later be conceptualized.

We must be this disclosedness, we have no other choice, we ex-sist. So, all the characters we highlight are not properties of a thing-object but ways of being ours, they are 'existentials'. To put it with some approximate image, these characters are constantly springing towards and from the disclosedness that we are. They determine and affect our very being, they are not indifferent to us, so that, in the most fundamental and always pointing to the ontological from existence, we are not primarily a kind of object-thing with qualities indifferent to this object-thing.

Along with these two modes of being, the being-at-hand and ex-sistence, which are different from that of the being-there, there are other ways in which we understand being according to the entity we are dealing with. For example, the 'other ex-sistents' (the human others different from me), the living, the abstract, and so on. Of these only the other ex-sistents will be mentioned below.

Now, in a first rough and general ontological characterization of our ex-sistence, we can indicate that we are entities that, on the one hand, in our being our very being is radically concerned to us, and on the other hand, that this being is, in each case, mine (Heidegger, 1927a, § 4 and § 9). That 'in our being our very being is concerned to us radically' means that we understand our being and that at the same time this being matters to us and is constantly "at stake" for us. We constantly "gamble" our being, but not necessarily in the sense of life or death, but in the sense of 'having to be'. We constantly must make decisions in our living, and this also implies deciding on ways of our very being, no matter how restricted our possibilities may be, or how comfortable or simple a certain decision may be at any given moment. On the other hand, this being that we are is absolutely 'individuated', not in the sense of a solipsism, or of isolated individuality,¹⁰ or of egoistic attitude, but in the sense of 'being, in each case mine'. It is my very being that concerns me in each case. 'In each case' means that, for example, you are also a 'me' from your ex-sistence.

These two basic and indissoluble structural characters of ex-sistence, 'being in each case mine' and 'being concerned my very being in my being' operate, so to speak, in unfolding the disclosedness of ex-sistence. This means that they are features that are implied in the understanding of the being of every entity and, in general, in the understanding of being as such. For now, it is possible to indicate that they are also present in a more concrete "image" that it is possible to give of ex-sistence: the 'being-in-the-world'. If we highlight and analyze the structural "moments"¹¹ of this being-in-the-world in which we concretely consist, we will recognize and develop the two fundamental features shown, and we will be able to arrive at the end, to the idea of temporality, with which we will be able to make a better ontological interpretation of time. The being-in-the-world is indissoluble but allows us to analyze its structural moments always maintaining its unity (Heidegger, 1927a, § 12). These moments are the 'being-in', the 'world', and the 'who' (who is-in-the-world).

The concept of world (Heidegger, 1927a, § 14-18) has already been outlined above when explaining the structure of significance of the time we deal with in our daily life, and part of it has been described in dealing with the subject of the being of useful-things. The world consists of a complex of significance with sense (which also includes nonsense) with

which it is possible to signify entities, to let entities come ‘to encounter us’, or let them presentify themselves.¹² It is an *a priori* ontological structure, from which we can deal with entities and orient ourselves among them and deal with existence itself. Therefore, it is obviously not a cosmic material world, nor the sum of all entities, nor anything of the sort. The world consists of a complex of preontological referrals inherent in our dealings with entities and constituting their meaning. For example, in our particular occupation, in dealing with the useful-things of our experiment, we are immersed in a chain of utilities: the clock is to measure time, and we measure time to get part of the table of data, to be able to find kinetic relationships,..., for-the-sake-of the development of humanity, for-the-sake-of my being of scientist, etc., i.e., for the sake of a possibility of existence. Here we could also start from the for-the-sake-of a possibility of our being and slide through the inverse chain to illuminate the being of the useful-thing (the clock, in our example). This chain is preontologically linked in a whole total complex (world) which is part of the disclosedness we were talking about. Additionally, each complex of referrals involved in dealing with some specific entity is not a fixed static chain, but depends on the interpretative path, as will be discussed below.

On the other hand, ‘being-in’ (Heidegger, 1927a, § 12, 28) constitutes a medullary moment of ex-sistence. Ex-sistence is its disclosedness, its open space of sense, and it is always so in a certain way (which also constitutes this disclosedness). This disclosedness is the being-in. Being-in is ‘to be opening the open space of sense’. It is given thanks to its three fundamental and simultaneous modes of opening: the ‘understanding’ (Heidegger, 1927a, § 31), the ‘attunement’ (Heidegger, 1927a, § 29), and the ‘discourse’ (Heidegger, 1927a, § 34). These three faces of the same phenomenon (the being-in) are indissoluble from each other, they are cooriginaries, and occur, so to speak, in unison¹³. Understanding consists in the opening of the being-in-the-world in its integrity by existing for-the-sake-of this being-in-the-world (and of disclosedness) itself¹⁴. It is one of the dimensions of being-in that contributes to constitute the clearness of ex-sistence. To open the being-in-the-world is “to see-feel” this structure in function of being for it, and specifically, at each moment, of being in the form of a certain way of this being-in-the-world. By virtue of this seeing-feeling we orient ourselves in existence, we know how to live and “glide” among the entities of the world and among others. That is to say, existing for-the-sake-of a form of my disclosedness belongs to the being of seeing-feeling (understanding) this disclosedness and its “components”, which implies knowing myself existing, knowing how to orient myself in existence, knowing how to exist, knowing what happens with me (with us), and hold in my hands my ‘possibilities’ of being.

In other words, since disclosedness is concretized in being-in-the-world, then we are always in-the-world, and, in fact, we exist for the sake of this being-in-the-world. The existential implication of this is that understanding has the form of a constant being turned towards some possibility of our being-in-the-world, being that we ‘can’ be, that we are ‘capable’ of being, that we have the ‘ability-to-be’. We always ‘project’ ourselves towards a form of our ex-sistence. This is so whether we are dealing with intramundane entities, with other ex-sistents, oriented among them, or whether we are looking at our own ex-sistence, or at the Being itself. In fact, for the implicit or explicit understanding of any entity and of Being itself, in our orientation in existence, in our living, we must project towards possibilities of our being. The entity itself we preconceptually understand on each occasion in terms of its possibilities according to a referential chain, which, finally, translates into a possibility of our ex-sistence. Possibility here is not a logical or statistical possibility, hierarchically inferior to reality or necessity, as something that will or will not happen. Possibility is our capacity-to-be or ability-to-be that is

“configured” according to the factual situation of each moment and on which we can pour ourselves. This ability-to-be has the sense of ‘knowing how to be’, as when we say, with or without words, “we can read the clock” or “we know how to read the clock” and we turn to reading. What is possible in this ability-to-be is existence itself. In its most immediate ‘essence’, this possibility is not captured explicitly in the manner of a datum for planning or something similar. The possibility is pre-ontological and is maintained as possibility, as an ability-to-be that we are unfolding in existence. Preontologically, we always deal with our possibility-of-being-in-the-world, we decide for or against an ability-to-be, and we hold ourselves in this capability as existential possibility. We understand ourselves in our ‘factual freedom’ for a certain possibility of our being. But this freedom for an ability-to-be is not in the manner of a kind of isolated will, for it is “configured”, “restricted” by the factual circumstances of each case.

On the other hand, we must immediately recognize the relation of understanding with significance and, consequently, with the world in general, alluded to above. The for-the-sake-of, which is at one of the extremes of the chain of referrals of significance, means for the sake of a possibility of our being, that we pour ourselves towards a certain way of existing, we are ‘projected’ towards a certain ability-to-be of ours. It is also necessary to clarify that the word understanding is given here a more fundamental connotation than comprehension, conceiving, cognizing, apprehension, explaining, etc., i.e., more fundamental than anything related to knowledge in its traditional meaning (for example understanding in the common sense). In our context, understanding does not mean any of this. Everything that pertains to knowledge can be described as derived from this more original understanding. Additionally, it is convenient to recognize in this ‘projecting ourselves towards possibilities of our being’, part of the feature of ex-sistence that we described with the phrase ‘our very being is radically concerned to us’. We indicate that this concern means, in part, the fact that we understand preontologically our own being. We must also emphasize that this ‘understanding our being’ always happens, not only when we are engaged in understanding ourselves, or only in perceiving ourselves (in the usual sense), but also in our daily dealings with the entities of the world, even if we are engaged in some activity in which we apparently lose all contact with ourselves.

A concrete example of understanding: in our average daily life when dealing with some intramundane entity, the meaning and the circumspective orientation itself are ‘configured’ by going through the chain of the referential complex of utilities in the structure of useful-thing for...for this...for the sake of a possibility of existence. This path is a path that takes place in one direction and in the other (also from the for the-sake of a possibility of existing towards the for this... useful-thing for) since it is given in unison, illuminating and giving sense to the being of the particular useful-thing with which we are dealing, that is, preconceptually giving itself its being. With respect to the phrase “giving ‘sense’ to the being of the useful-thing”, let us indicate that the concept of ‘sense’ is central not only in the understanding, but in ex-sistence itself. Sense is the ‘ultimate background of projection of understanding’, and in general, of ex-sistence, for it “configures” Being itself. Expressed more figuratively: sense constitutes the “substance” and ultimate structure of the ‘clearness of being’. So, we say that being has sense, thus we understand entities in their being. We will see below that this sense is what we are looking for in this paper.

On the other hand, the ‘attunement’¹⁵ (Heidegger, 1927a, § 29-30) is the other side of the opening of disclosedness itself

(being-in) and points to the constant and fundamental affective openness. On the ontic level it corresponds to our mood, our state of mind, our being attuned, our temper or affective state, our affective disposition, to our affective dimension when dealing with entities, etc. The usual questions “how are you?”, “how do you feel?”, “how are you doing?”, give clues about the deep meaning of moods for the ex-sistence. Beyond an everyday answer and whatever the situation, these questions point to the fact that we know about ourselves (about our opening), that we can find ourselves, that we know that we are being and of a certain way in our circumstances, and even that we know that we have-to-be. This “knowing” is not knowledge in the usual sense, but an opening, in the sense of ‘having always left in evidence with the whole being’. So, beyond the usual way in which we interpret moods they open to us our condition of being consigned or delivered over to ex-sistence (ex-sistence that we ourselves are), they open to us how we are, and they open to us the fact that we have-to-be.

The attunement opens us (shows us affectively) in our being-in-the-world as such, and in the fact of having-to-be-in-the-world, that is, it opens us our ‘condition of thrownness into existence having to be’. However, usually we turn our backs on this fundamental showing, we usually repel or dodge what is shown, and deliver ourselves to the world, lost in our occupations and in our dealings with the entities and, projected towards particular possibilities of being, we partially interpret what is shown: we remain with our particular affections, which point to these occupations and our being among intramundane entities and with other ex-sistents, etc. In fact, to the above-mentioned questions, we often answer confusedly and talk about what we do and not of our moods. However, our existence shows us again and again that states of mind are so fundamental that they open up existence in such a radical way that they surpass all knowledge however profound it may be. They radically open and affect our being and ability-to-be-in-the-world. Moods come upon us because they come neither from “inside” nor from “outside” but from the totality of being-in-the-world, from the structure of existence itself. They can suddenly shake up our whole life or guide our chores.

Attunement constantly constitutes existence, and, with it, also constitutes understanding; understanding is, so to speak, tuned, tempered by attunement. Vice versa, understanding gives meaning to our wisdom opened by our attunement. We are always in some mood state because we find ourselves and have always found ourselves in this or that “way”¹⁶. Already in its foundations, without any “explanation”, we are in condition of thrownness into existence and destined to have-to-be as ex-existents. The condition of thrownness is what is called the ‘facticity’ of existing. In its being, we are in fact already in the world, among the intramundane entities, and we are so in a certain way. All this remains open to a certain extent in the mood states. But moods can also stubbornly close off existence, as is the case with states of mind such as anger, frustration, and being “out of our mind”.

We understand ourselves always as already being. As we indicated above, also in the understanding of the entities of the world their being occurs, in part, as an affection that touches us, signifies us, and reaches us, by the fact of already being beforehand thrown into the ‘world having to exist, that is, being in affective disposition. That the entities, that the events concern us, that they are significant (examples: the threatening, the delightful, the profitable, etc.) means that we are already in ‘attunement’ and that we ‘let the entities and events come to encounter us’, since they touch us in our being according to some possibility of continuing being-in-the-world, among the intramundane entities, among the others, etc.

On the other hand, both attunement and the condition of thrownness can be attempted to be explained ontically by some way and under certain limits, such as, for example, by means of biochemical mechanisms. In fact, all life, birth, reproduction, and death, can be explained mechanistically at the molecular level. For example, when we are sick, we open the disclosedness in a quite different way than when we are healthy, and the disease can be explained as metabolic affections or disorders. The same with respect to the condition of thrownness into existence, which can be related to have being born, as originating from our parents, the line of our ancestors, the biological-biochemical evolution,...the original “chemical games” that most likely made possible the prebiotic chemical reactions that resulted in the first forms of life, etc. All this is correct, but again, that is not the point here. In this writing, we are not objectifying our life and all its aspects, as if we were stepping out and looking at ourselves from afar to understand the machine that we are. Here the look is from existence itself, ex-existing, describing the being as it is while we are ex-sisting. The point is to show the structure of being that we, preontologically, open¹⁷, in which we are “immersed” in our existence, from our constant opening in fact, independent of whether a subsequent ontic-scientific explanation can be configured that would explain the ontic origin of this opening in fact. In order for the mood of being down to come upon us by being sick, we must already-being-in-the-world-having-to-be. We must already be affectively tempered for our full existential integrity to be reached and shaken in its being by the disease. It is evident that, on the one hand, a biochemical explanation can only be given from ex-sistence, already immersed in it, being-in-the-world, steeped in sense, that is, every ontic explanation is configured and, so to speak, is affected by the clearness of being. On the other hand, in the thrownness condition lies an existential that could perhaps be grasped with expressions such as: “thrown into existence”, “why me?”, “the mystery of the me”, the “from me that accompanies me everywhere”, etc. An ontic gaze of mechanisms, although undoubtedly useful for the advancement of humanity, is not completely sufficient, it is not enough to account for existential expressions. The exclusively ontic gaze is condemned to be incomplete to our purposes because it is based on a partial gaze of the whole, on a single way of understanding being, as being-there.

If we wanted to synthesize the two faces of being-in exposed, understanding and attunement, we would say that we are ‘possibility thrown’, or that we are constituted by facticity (thrown, attunement) and existence (possibility, understanding, being-able-to-be). Likewise, we can add that our very being is concerned to us radically because we are defined in our structure through facticity and being able to be. On the other hand, and as we shall see below, the possibility of interpreting measured time is founded, in its being, on that which lies at the basis of understanding and attunement: temporality.

With these two complementary ways of concretizing the being-in we can show another very important aspect that is usually recognized in the understanding, but which is also part of the attunement: ‘interpretation’ (Heidegger, 1927a, § 32). With this we will also be able to show the other concreteness of being-in, which is a ‘moment’ inseparable from attunement, from understanding and from interpretation: ‘discourse’.

The interpretation corresponds to the development of the projection implied in an affectively tempered understanding. It is the appropriation of an understanding. By appropriating an understanding, we move along a particular interpretative path. For example, during the experiment we understand the stopwatch as useful-thing in-order-to measure the time data that,

together with the concentration data, will make up the data table for that day, in-order-to carry out our work, in-order-to... for the sake of a form of our being. This stopwatch concerns us to do our work, for by means of it, in an already-being-in-the-world, world from which this useful-thing stands out, we project ourselves towards our more own being-able-to-be-in-the-world, and towards a continue being in the midst of the intramundane entities, with other ex-sistences, etc. So, we preontologically appropriate the stopwatch as useful-thing with the structure of the something-as-something: an useful-thing in-order-to measure time, in-order-to obtain data, etc. If in the middle of our measurement experiment something unexpected, sudden and extremely significant and affecting happens, and makes it impossible for us to continue in the work, then that measured time, the measuring instruments, the room, etc., we interpret them in another way to deal with the urgent matter. For example, these useful-things can become insignificant, since our possibility of being is already different, or, on the contrary, they can be useful to date and permanently portray a shocking moment of life, or one of them can be interpreted at that moment as a useful-thing that fulfills an urgent function different from the one for which it was conceived, and that accounts for another particular being-able-to-be of ours where, for example, our being-in-the-world itself is threatened, and we retreat in certain attunement. In this case, we force the stopwatch or another tool to a being different from that of that tool itself.¹⁸

Now, we will show very concisely the structure of being of interpretation: interpreting is based on a 'fore-having' (what of the world we have in advance, ontological previous input, in which part of the world is highlighted), a 'fore-sight' (a previous way of seeing which 'cuts' the fore-having towards a certain interpretability) and a 'fore-conception' (a previous way of understanding, which consists in a series of preontological concepts relative to the entity in question with which the interpretation is carried out). The other thing we can say about interpretation is that it is not usually expressed explicitly in spoken words, let alone written, it is not necessarily articulated in "conscious" and orderly thinking. In fact, we are always interpreting preconceptually in our daily living. For example, when we sit on a chair to perform our measurement, we are interpreting it because we understand it as useful-thing for sitting in virtue of the ontological connections of the respective referential complex. Another example: a well-performing soccer player does not have to make explicit with a spoken speech what he is doing at the moment of a great play, but he is totally oriented and understands perfectly implicitly and therefore interprets well the ball, the field, the space, the rivals and their movements, the goal, the goalkeeper, etc. If we were to ask him to explain what he does or how he does it at that moment, he would probably not know how to do it and on top of that we would immediately spoil the master play. One last thing to say regarding interpretation, and that is that this very text is based on a very particular interpretation: the statement (written in this case). This ontology of time is an explicit discourse related to a thematizing interpretation of all existence, the ontological-existential interpretation.

It remains for us to describe the third concreteness of being-in, discourse (Heidegger, 1927a, § 34). Discourse is the very articulation of the interpretative and affectively disposed understanding. In existing we are discoursing (ontic-ontologically) among the intramundane entities, with the other ex-sistents, etc. To orient ourselves and "see" circumspectly, to relate to each other, to realize ourselves as persons, etc., all is possible and occurs in an articulation of the "components" of being of understanding, of attunement and of interpretation. Often this articulation occurs without words in our "unfolding of existence". But this discourse is also expressed in the form of speech, both oral and written. Therefore, speech is not a second floor in the discourse, but it is the discourse itself to which words sprout in this ontic-ontological game in which the

ex-sistence consists of.

The other structural moment of being-in-the-world is the 'who' is-in-the-world (Heidegger, 1927a, § 25-27). We indicated that to the ex-sistence belongs the being-in-each-case-mine. It is my very being who is concerned to me radically in each case. But this 'me' or 'mine' is not to be interpreted as a "I" that is the center of acts. Not in this traditional way. Nor is it a subject, if by subject we understand ourselves as a being-there (object-thing) opposed to objects, which also are-there, in the classical philosophical subject-object duo. In its most immediate being, it is not a subsistent substance that remains identical to itself throughout time and the changing experiences. We are not a kind of inner being that in our living we relate ourselves to the outer world. We are not a kind of consciousness to which we bring perceptions in our interaction with the world outside. These traditional ontic-ontological views are limited to clearly describe the most immediate being of ex-sistence, for it is pure disclosedness where inside and outside have no meaning. More fully, ex-sistence is about the disclosedness itself, the "world of being", where the 'me' or 'mine' is implicated. So to speak, we cannot escape from this being always implicated in the clearness of being, for we are itself and we open it "at the same time", so that, in leaving it, we leave ourselves, that is, we no longer are, we no longer exist. Likewise, it is necessary to indicate that, ontologically speaking, the other ex-sistences, the others, always constitute to the 'me' whose very being is concerned to this 'me' radically, and this is so whatever the concreteness of the 'who'. In the first place, the others have 'presence' in everything we do and everything that happens to us. The stopwatch with which we make our measurements was invented, made, and calibrated by others and is an expression of the others in 'me' as I understand it, which is why, in part, we can use it. The science we do, the music, etc., was, to some extent, prefigured by others and I carry it with others. This same discourse is in part a discourse of others, the language I use, the computer on which I write, etc., in short, being itself is shared. In their immediate being, the others 'are-in' the same constitutive world of our ex-sistence from where, "at the same time", they come to encounter us. This means that, as far as ex-sistence in its fundamental being is concerned, the being-in-the-world is a 'co-being-in-the-world', for we ourselves 'co-ex-sist' for others and vice versa¹⁹. That is why we can understand the same, 'co-being' in something common, share the being of something. At this point, it is convenient to emphasize that what we called the publicity of time has its ontological origin in the co-being-in-the-world.

Having said all this, the who that is-in-the-world is to be sought, rather, in the way in which the me or 'mine' is given, in its concrete modes of being, that is, in existing 'from-itself', or 'from-things', or in its intermediate modes, or also indifferent ones, etc., in the firmness or otherwise with which we-are-in-the-world. At one extreme, in an immediate, average, everyday way, the concrete who is the impersonal 'one', that is, 'everyone and no one', the 'they'. It is the way in which we are-in-the-world, mainly guided by the things, people and circumstances of the world. The who that exists from-things, the one, the they, is the one who immediately and on average is motivated, is decided, acts, has projects, understands and interprets in a certain way, takes decisions, etc. One speaks as one does, one chooses this or that, within the possibilities available and configured by one. One understands being as one usually does. A very relevant point for this paper is that also one understands and interprets time as one usually does, and that it is the most natural way. We implicitly understand it as the time that we give ourselves and the time that we have, the one that carries its accent on presentification and has the structural components of 'datability', 'spannedness', 'publicness' and 'significance'. We explicitly interpret it as linear time made up of the past, present and future, and which can also be seen as the successive course of the irreversible

series of 'nows', and in its most abstract form as a geometric line of time.

On the other hand, at the other extreme, in the mode of the 'who' that exists 'from-itself', we take our ex-sistence into our own hands and are ourselves. Implicit in this mode of being of our ex-sistence is having a high degree of understanding about it. But not necessarily explicit, thematic understanding and interpretation, but a firmness and certainty of what we are concretely in our individuation. We know ourselves, and this is how we are able to 'direct our life' faithfully to our being. Thus, we have the possibility to understand ourselves in our destiny as historical beings, where we can 'retake what we have been'. Hence, we can be truly creative and turn towards our destiny within our ontic limits. We will return to this extreme mode of the who below.

We are now able to configure a first encompassing and essential image of the being of ex-sistence. If we always give ourselves concretely as being-in-the-world, which means that we permanently project ourselves with some firmness of state towards possibilities of our being, in some affective state, and among the entities of the world, then we always 'anticipate ourselves being already in the world and in the midst of the entities of the world'. This image of ex-sistence is Heidegger's proposal to encompass in a first instance what we essentially are, and we could synthesize it in the word 'care' (Heidegger, 1927a, § 41).²⁰ The being of ex-sistence, the care, consists in 'being ahead-of-itself by being already in the world and in the midst of the entities that come to encounter us in the world'. In understanding we are projecting ourselves into some possibility of our being (some 'being able to be'), so we are anticipating ourselves. This is so "always", "at all times". But this is only possible if we are already in the world, de facto, in thrownness condition, which implies being disposed in this or that way, in some attunement. But we are already in the world thrown, that is, 'fallen' among the entities of the world with which we have to deal, in circumspective occupation and in dealing with the co-existent others. Of course, projecting ourselves towards our possibilities, is a being able to be those possibilities, which means that they are conditioned by our de facto situation (background of the attunement). Vice versa, the facticity of being and the attunement are articulated in an 'interpretative understanding'.

Care as a preliminary image of the being of ex-sistence can become even clearer if we unveil its 'sense' or 'structural background', that is, the 'temporality' ('original time'). For this purpose, it is first necessary that we briefly describe two essential aspects of existence in which we will be able to realize more unequivocally this sense. They are 'angst' (Heidegger, 1927a, § 40) and 'death' (Heidegger, 1927a, § 48-53).

Angst is a fundamental attunement with permanent implicit presence of background, and that can be made explicit (i.e. that emerges, but preconceptually) at any time, since it is related to the permanently opened, but usually evaded, image of the existential situation of our being. It usually has a negative connotation because of its capacity to totally remove the ex-sistence from the warm familiarity of its habitual world. When we are angsted, we feel existential anxiety and the things of the world lose all meaning, they tell us nothing. Everything becomes inhospitable, and we become totally isolated, alone with our being. We feel "as if floating in nothingness". But before what or whom do we become angsted? and, for what or who we angst? The before what or whom of angst is not an intramundane entity or another ex-sistence, as happens when we are in 'fear',²¹ but rather we are angsted before the preontological revelation of our being-in-the-world itself in existential condition of thrown. The 'for what or who we angst' is neither some intramundane entity nor another ex-

sistence, nor is it just a specific possibility of our being, but we anguish for our being-able-to-be-in-the-world itself. The angst isolates the ex-existence so intensely that we can see the being of the ex-existence clearly and completely, although not conceptually, but preontologically, nevertheless, revealing the possibility for an explicit, ontological opening, if we decide to do so. Angst brings ex-sistence out of its trivial, mundane mode of being (that exists from-things), for there is nothing that the one, which has an answer for everything, can offer us in that radical isolation in our very being. It is my own ex-sistence that is isolated and unveiled before itself. In the form of an existential helplessness that shows our thrownness condition, of already being in the world; we see our permanent 'to be being a having been'.

On the other hand, ontologically-existentially speaking, 'death' is the death of ex-sistence, that is, that of my being. In each case, it is my very being that dies. This implies that the meaning of the word death that we wish to emphasize here is not that of the death of a human, the decease of others, or the passing away of an animal, nor anything of an ontic-ontological type in the usual sense. "One dies sometime..., but not yet" says the ex-sistence when exists 'starting-from-the-things', but this is not the ontological sense indicated here for death. Death is radically own, it is my existential death. It is extreme individuation. It is the possibility of the absolute impossibility of existence. As a possibility it is a radical part of understanding, that is, of the being of ex-sistence. We "constantly" project ourselves towards a possibility of our being under the background of the most authentic possibility, death, which, so to speak, configures part of the sense of existence²². We usually understand this only in an implicit, preontological way, but, of course, it is possible to do so explicitly, even it is possible to reach a high interpretative clarity with respect to its ontological structure. However, in the mode of the who that 'understands from-things' death is understood from an aversion, of a turning away from this possibility, a constant flight from facing, in its being, this possibility. We say, "one also dies, but for the time being not", and we leave this intuition and knowledge of the one as such, undefined, and plunge into the pressing inescapable occupations of the one, or we develop the being of death in various indirect ways, which implies continuing to turn our backs on its true being. Whoever truly accepts to see this constant 'to be towards death as an insurmountable possibility' has, in turn, the possibility to appropriate its ex-sistence, to take its destiny into its own hands in accordance with its true and individuated historical being. It is necessary to clarify that here the authentic "acceptance" of death, or its ontological exposure, is not a matter of being turned to death waiting for its inescapable arrival²³, and that the attitude may be one of enthusiasm, courage, recklessness or depressing or paralyzing defeat. This is not the meaning of facing the being of death. Death, understood ontologically-existentially, should not be seen as an event that will arrive just as other events arrive, but as a 'constant possibility' of my being that accompanies me always as a possibility, and should be maintained in this being of possibility. Death does not come to me as an event²⁴ but constitutes my being constantly as long as I exist.

The attunement of angst not only opens, clears and exposes in its being to the ex-sistence in its thrownness condition, in its dimension of an already-being-in-the-world, but also shows the condition of 'being turned towards the ownmost, inescapable, uncertain and insurmountable possibility of death'. However, angst does not reveal to us anything about whence we were thrown and delivered over to our being, nor about the whither of our death. In this way, only the isolated existence remains, and it is preontologically revealed to us that, by the fact of our existing, we are ourselves the negative foundation (nihility in the origin) of our own ex-existence²⁵.

On the other hand, all this that opens angst can be assumed from the two extreme modes of existence, namely, from-itself, when we really face it, or from-things, when it is dodged. When we assume it from-itself in its authentic form, we listen to this kind of “call of our own being isolated in abandonment”, and we attend to see what it shows us: our own being such as it is. This is not necessarily an explicit seeing, it may be preontological, but such is its clarity that we cannot remain in-things, in the mundane, and are impelled to ‘go ahead’ of ourselves and take our being into our own hands. This is called ‘anticipatory resoluteness’ (Heidegger, 1927a, § 62).

Now let us expose the ontological sense of care, the temporality, the originary time (Heidegger, 1927a, § 65). We said that the word sense points to the structural background of the being of the affectively tempered and discursive understanding, that is, the background that “operates” in the ahead-of-itself by being already in the world and in the midst of the entities that come to encounter us in the world (Heidegger, 1927a, § 65). On the other hand, when we resolutely forerun, we anticipate ourselves to our ownmost possibility of being, assuming it, and with this, assuming our foundation of already being in the world among entities. All this is ontologically possible if ‘we let ourselves to come to ourselves in our being by bearing our most eminent possibility as possibility and by assuming our being as a having been that is, which has as a consequence that we let the intramundane entities come to encounter us such as they are’. The temporality then consists in ‘coming to itself being a having been, which presentifies’. The coming to itself is the background of ahead-of-itself of care structure. The already being in the world of care has its background in being a having been, or a ‘have been that is being’²⁶. The presentification is the background of ‘in the midst of the intramundane entities (letting them come to encounter us such as they are)’ of the care structure. However, we must always keep in mind that although these backgrounds can be highlighted separately, they constitute an indissoluble unity. The coming to itself “propitiates” a being-able-to-be, retaking a having-been-that-is’, i.e., a ‘being already’ that, so to speak, “always operates” and express in the form of attunement. We only can anticipate to ourselves if there is an ‘itself’²⁷ to which we “constantly” comeback. The being-been (a having been that is) is only possible in a coming to itself, that is, in a taking up “again and again” this being-been, “configuring”, with that, the ex-sistence, and remaining in the disclosedness. Similarly, the ‘to come to itself being a having been’ is a bringing forth the present. For example, my presentification of an intramundane entity is only possible in a ‘to come to myself being-been’ that in it “actualizes” my being by signifying the entity, that is, letting the entity be as it is, and so that it may be, or, in other words, by “configuring” its being, i.e., to part of the world, and, with it, of disclosedness²⁸.

Ontological-existentially speaking, the originary time or temporality consists in this constant ‘coming to itself being a having been, which presentifies’, which constitutes the structural background of the being of ex-sistence, of the opening of disclosedness, background also of the clearness of being. Its salient moments have to do with the usual future (coming to itself), past (being-been) and present (presentifying). But the originary future is not a ‘not yet present that is coming’, but a permanent ‘to come to itself’. The originary past is not about ‘no longer present’, but about a being-been that “operates always” and to which ex-sistence cannot renounce, for I can only have been while I exist. And the originary present is not a ‘now’ but a presentifying that “springs” from the ‘coming to itself being a having been’. Ontologically speaking, the future is not approaching to the present, a future which would become the present, but, on the contrary, the present “sprouts” from the ‘coming to itself being-been’ (Heidegger, 1927b, § 19 b); so to speak the originary present is configured from the

operation in unison of the originaries future and past. We can only let something come to encounter us, presentify an entity that comes to presence, by an understanding affectively tempered, which 'is given' preontologically²⁹.

Now, the form in which ex-sistence is its present from-itself (authentically) is what Heidegger calls 'clear instant'³⁰ and refers to a 'to be opening the whole situation of ex-sistence'; from the anticipatory resoluteness, in its authentic future, understanding its being and "taking it in hand", anticipating-itself and bearing the most proper possibility of being, taking charge of its foundation of being already in the world. Only in the clear instant it is possible to serenely evaluate the whole existential situation, to assume the ex-sistence, which opens the possibility of, for example, truly appropriating the historical legacy. On its side, and obviously hand in hand with the clear instant, the from-itself mode in which ex-sistence is its future is the anticipatory resoluteness, attending to the call of its own being, and taking it in hand, which opens the possibility of abandoning to a certain extent the one (the they) and configuring the ex-sistence ownmost 'destiny'. Likewise, and hand in hand with the previous ones, the from-itself mode in which the ex-sistence is its past is to 'retake' itself (to 'repeat' itself) in order to 'configure' its destiny, this implies not suffering from self-forgetfulness.

An additional comment. We have delineated that the constant 'coming to itself being a having been, which presentifies', is the sense or background of projection of the being of ex-sistence. Its constitutive moments are also called 'ecstases' of temporality, for they consist in the 'going out in their respective direction'. They, in turn, project themselves into a background: the 'coming to itself' projects itself ecstatically into the 'self' of the being able to be; the 'being a having been' projects itself into the 'self' of the 'coming to itself', that is, into the 'to have been that I am'; and the 'present' projects itself into the presence of that which it presentifies, that is, into another entity (Heidegger, 1927b, § 19 b). But let us leave it at this point with respect to originary time, since for this paper this characterization is sufficient.

5. Temporality as origin of usual time

Since temporality constitutes the structural background of the being of ex-sistence, of the being of understanding, and of Being itself (Heidegger, 1927 a, b), it is not correct to say that "temporality is". There is no common language word to name its "operating" so we say that 'temporality temporalizes', and this also means that 'unfolds' its full structure "every time" that temporalizes. The usual way (from-things existing mode) in which temporality temporalizes is that of a presentification that 'awaits' (or not) and 'retains' (or forgets). This means that the emphasis is placed on the 'present'. In the average everydayness we stay in the present, for as the thrown entities that we are we are fallen among the entities of the world, with which we have to deal in our daily occupation, confronting them, and, therefore, in an affectively tempered understanding of them, presentifying them. The being-at-hand and, in a well-founded manner, the reality (being-there, subsistence) of intramundane entities are imposed on us, and very often, in an urgent and unavoidable manner. The chores of the world and the dictates of the 'one' are pressing. Thus, for example, we understand the being of useful-things, the being-at-hand, in the referential complex of a 'usefulness for...for this... for-the-sake-of a possibility of our being' of the structure of the world, and its inverse chain 'for-the-sake-of...for this...and the usefulness' of the useful-thing that is in respective condition. With this, its specific being is partly "configured", which we understand and interpret as such, that is, we 'let the useful-thing come to encounter us such as it is and in order for it to be so, we presentify it'.

Similarly, we understand ourselves in circumspective occupation from what the entity of our occupation gives of itself or refuses, that is, we understand ourselves from the presentification of the useful-thing. This means that the way in which the temporality of ex-sistence is temporalized as future is that of awaiting a mode of being from what the entity of occupation, presentifying itself in its being, gives or does not give of itself. We are awaiting for our possibility, for our being able to be from our occupation, or colloquially said “we are what we do”. To presentify entities in the occupation we must have ‘forgotten’, not bring forth, hide, turn our backs on what we truly are. That is, the way in which ex-sistence in the mode of exist from-things temporalizes the past is the forgetting of itself, the running away from its ownmost being³¹. This allows the retain (past with emphasis on the presentification) of the entity that is-at-hand. In synthesis, the temporalization of the temporality of ex-sistence in the circumspective occupation, as for example when the stopwatch is used, consists in a to be awaiting (a possibility of our being, and also, events) that retains (entities, events), presentifying the entity (event) and forgetting the ownmost authentic being. This means that the present has a central role, and that we lose ourselves in the present. This temporalization is the consequence of having to deal with entities, which ‘come and go’, ‘appear and disappear’ and, when we look at the future, we understand it as not yet present, and the past as no longer present³². In contrast with the from-things form, the from-itself form in which ex-sistence temporalizes temporality consists, as we delineated above, in the anticipatory resoluteness (taking on the originary future, coming to itself) that ‘repeats or retakes’ (taking on the originary past, being-been) “configuring” the clear instant, that is, the whole existential situation (taking on the originary present). This being in property of the ex-sistence is not necessarily given explicitly, rather, it occurs preontologically most of the times, which is embodied, for example, in an integral, oriented, harmonious behavior in the mode of exist from-itself.

With these elements, we can now return to our example of monitoring concentration over time, an activity in which we occupy ‘the time allotted to us in existence’. We said that the time of our occupation has the ontological structure of significance, spannedness, datability, and publicness. All of them can be understood from the temporalization of temporality that is given in the from-things mode of existence, that, obviously and as we indicated, derives from originary time. As we explained above, in significance we are awaiting (non-originary future) for a possibility of our being from what the object of occupation (in this case everything that involves the measuring of my experiment) gives of itself or refuses, which implies retaining (non-originary past with emphasis on presentifying) the entities, the measures, etc., forgetting (non-originary past) our own being, in order to let the measure, the time, the simultaneity, etc. come to encounter us as they are, presentifying them (the present). The spannedness of time we are dealing with is also understood from temporalization of temporality in the from-things mode of exist. In presentifying by articulating a now we must necessarily be *a priori* in the horizon of before and after, of past and future, but in the form of the retaining that awaits. In the awaiting an ‘in-betweenness’ (spannedness) is configured and the retaining always occurs in what has taken and takes time. Now, spannedness ultimately originates from temporality, for coming to itself being a having been is comprehensive in itself and is concretized in the form of an understanding affectively tempered which is, for this, intrinsically spanned. In coming to itself we are projected towards a possibility of our being, returning to this itself, that is, to the being-been that we always are, but at the same time, ‘prefiguring’ this coming to itself, this being able to be ours. This means that it is an integral structure, encompassing in itself.

On the other hand, by virtue of our co-being-in-the-world, the awaiting by retaining with which we affectively tempered understand in our modality of existing from-things, is a co-awaiting by retaining with which we affectively tempered understand in common with others, with whom we share the world. That is to say, the very affectively tempered understanding of time is common, and with it, time is public, especially when we date factually with a world entity common to all (for example, with the sun's position, or with "universal time").

Now, let us dwell a little on the structure of datability of time. By means of it, we will be able to better evidence the temporalization of temporality in the form of usual time. When we look at the time on the clock, for example, when we say, with words or not, "it is 20 past 9", we are numbering a fact, because we understand it, interpret it, articulate it and, with it, we express it. "It is 20 past 9", means "now, that it is 20 past 9", that is, we say with or without words "now" and we presentify something: 20 past 9. "Now that this or that", and with the "that this or that" we date, presentifying, expressing what happens, that is, we are interpreting an event, a thing, what we do, our occupation, etc., and, with it, we interpret ourselves. Datability corresponds to a presentify, an interpreting what happens and concomitantly an interpreting ourselves. But in this usual form of time, the presentification is a presentification that awaits (non-originary future) and retains (non-originary past), that is, it is always temporalized. In the reading of 9:20 the presentification is very particular, for it is a presentification of a number. But this number is in condition respective with the total time, for example, the scale of the 24 hours of the clock, in condition respective with the unit of time, with the 'for what' of the measure, etc., and at the end with the 'for-the-sake-of'. In the presentification of 9:20 we are awaiting not only for the passing of time, or another event, but for a form of our being: our being able to be is "ontologically configured" from what that reading and the events do or do not give of themselves. We retain 9:20, we presentify it, and at the same time we must forget what we truly are as ex-sistence. In dating by presentifying 9:20, we are interpreting this time (fore-having, fore-sight, fore-conception); we let it come to encounter us, that is to say we "prefigure" its being in the referential complex that has as its extreme in the 'for-the-sake-of', but we do it in a particular way (interpretation).

But this is a direct expression of temporality, for it is one of its 'ecstases', the present, that stands out with particular preeminence. Ontologically exposed, usual time corresponds to the very temporality coming to the fore in the usual mode it does, not originally, not showing itself as it is, but from-things mode, by placing the emphasis on presentification (temporality of occupation). Originary time usually manifests itself in the present; the time known to our common sense is the self-interpreting present. It is in the present that the accent is placed, so much so that the past and the future are understood from the present: no longer present (past), not yet present (future). Ontologically speaking, this is an inverted interpretation, for it is, originally, the present that springs from the future and past, and not the other way around. The time of occupation is the only one we know explicitly in our day-to-day, but we always exist "preontologically prefigured" by our structural background, the originary time.

An ontological consequence of this is that *by saying "now" we are giving time to the clock*, for the usual time we read is an expression of the temporalization of temporality. The clock does not give us time, it only gives us the "how much" and "so much" of time. Ontologically speaking, time is neither in the hands of the clock, nor in the mechanism, nor in the numbers, nor in the unit of time, nor in the graduation, nor in the relation of the unit of time and to the total temporal stretch. Nor is it in a subject if by this we mean that we are a psychic, subjective thing. Time itself consists in the 'horizon (structural

background) of sense of ex-sistence itself'. In other words, time and ex-sistence are indissoluble. If we no longer exist, there is no horizon, and it is neither possible to affirm nor deny anything. Then *we always give time to every clock* be it an artificial, natural, or circumstantial clock of dating by means of an event.

Finally, time in the form in which it is usually explicitly interpreted as an irreversible, infinite, and unidirectional succession of infinitesimal 'nows' or 'instants-presents', in which the past is understood as what is no longer present and the future as what is not yet present, has its origin in a form of temporalization of temporality in which presentification predominates extremely. In this form time comes to be interpreted even as an entity that is-there (subsistent-thing, thing-object, something real), and even as a geometrical object, the line of time. Its dating is given as a special presentification in which the being-there of the number indicating the hour is presented in metrical relation to the being-there of the total stretch of time (e.g. 24 hours, etc.) and the unit of time (e.g. the second, the minute, etc.). On the other hand, even in this extreme interpretation, a sort of reminiscence of time in its from-things form (time of world, implicit interpretation of usual time) emerges, since it derives from it (and ultimately, from temporality). For example (Heidegger, 1927 a, § 81), the irreversibility and unidirectionality of usual time reveal the concealment of the background understanding of time, in which temporality is given as a being the ex-sistence turned towards the ownmost possibility, death, a coming to itself in this radical possibility. The expression "time goes by" reveals, on the one hand, that we would like time to stop, and on the other hand, that we understand, deep down, that 'we are in version to death', and that we show ourselves resigned. Also, our desire to live longer, to extend life, to remain in the familiar everyday average life, or to avoid talking about death, to avoid confronting it in what it really is, reveal, as far as being is concerned, that we 'turn our backs' on our true being. This is also the case in everyday expressions such as "one dies sometime, but for the time being, not yet". All of them speak of our from-things mode of being, in which we flee from seeing our ownmost being, from seeing our background of being turned towards the possibility of the absolute impossibility of existence. In the same way, the interpretative understanding of usual time as infinite is in part propitiated by this aversion of the originary finitude of our being, but our authentic being is finite, for our structural background, the originary time, temporalizes as finite.

And death was very close, hovering around

At least that's what I thought until the clock said

That it's always been guiding my life

From the wet drum of birth

6. Summary and last remarks

Within an ontological gaze, we exist, we understand Being, and with it, we orient ourselves in and with entities in conformity with our most radical sense, that is, in conformity with originary time. For everything we 'coming to itself (originary future) being a having been (originary past)'. The consequence is that we can confront ourselves with entities by presentifying them, we understand them affectively tempered, interpreting them discursively, i.e., their being is given.

The presentification imposes itself in the average daily life because of our 'having to deal with entities', for this reason it seems to us the only true and "reference point" for past and future, since being is also interpreted from the mode of being of being-there.

Since as long as we exist always our structural background consists of temporality, then even if ever science is able to realize the, for now, science fiction dream of time travel, where time is understood in the usual way, as linear time, even so, we will still 'carry with us' our structural background of ex-sistence, the originary time.

Originally, the future does not come into a present by presentifying itself and then disappearing into the past as if it were a thing-object that comes to encounter us and then goes away, as is usually understood in a natural but derivative way. Rather, on the contrary, it is the present that 'springs' from the 'coming to itself being a having been', that is, from the originaries future and past. That is why when we look at our watch and say with or without words 'now', calculate and take time..., in the end we give the 'now' to the watch, we are giving it time.

It is quite another thing that existence, our ex-sistence, is always concerned by presence (I am not referring to the present, nor to presentification), by the 'coming to itself being a having been' (Heidegger, 1962). But to analyze this subject deserves another writing.

*I measure and measure and come back to the clock
for I cannot stop coming to myself being a having been
the 'one', the 'they', all of us, myself, presence
just at the impossibility of nothingness*

Statements and Declarations

Competing interests

The author declares that there are no conflicts of interests/competing interests.

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Footnotes

¹ The physical reality of the mechanics of low-mass bodies is initially foreign to our common interpretation, which was made for bodies of macroscopic mass. That is why what quantum mechanics describes, and its tools, seem strange.

² [Vorhanden] from [Vorhandenheit] or [Vorhandensein] in German.

³ Contrary to how it is done in some translations of Heidegger's texts, I prefer to use the expression being-there as a translation of [Vorhanden] (as is done in Rivera's Spanish translation, indicated in the reference Heidegger 1927a), and using 'ex-sistence' for the German expression Dasein (Dasein is human existence in Heidegger). Da-sein literally translates being-there, and the "there" and the "being" have a very special connotation when they refer to human existence, which will be explained in due course without the need to keep the word Dasein in its literal sense of being-there. Furthermore, in my opinion, "human" Dasein means something like "to be being the there in the sense of 'disclosedness'", and a literal translation as being-there does not encompass this complexity. The expression being-there can be used rather for 'being there in front', 'being there present', existing as something "in front", appearing to us and which is the object of our consideration. As a translation of [Vorhanden] I prefer being-there to other that may seem even stranger.

⁴ In the past, the second corresponded to 1/86,400 of the mean solar day, but since the period of rotation of the earth is not stable for multiple reasons, today it is regulated by means of atomic clocks. Thus, the second is established as the duration of 9,192,631,770 periods of the radiation emitted in the transition between the two hyperfine levels of the ground state of the isolated cesium-133 atom (SI, 2019).

⁵ Here the word "exists" in the usual general sense of the fact that something is and in its being so. Not referring to human existence in the ontological-existential sense.

⁶ "Things" in its broadest sense.

⁷ 'We let...come to encounter us in their being': this expression does not mean that we are doing a voluntary or involuntary action, that, for example, we are giving them license to 'encounter us' or provoking this by means of an action. Nor does it mean that we are creating something. It is not an ontic 'letting encounter', but a preontological one, with "realms of meanings" (but not in the sense that we are creating these meanings with an ontic mechanism), i.e., that we understand them as such.

⁸ 'Useful-thing' is a broad expression to designate the entities we deal with, for example, a tool for work, a means of transportation, the water of the pool in which I swim, etc. An institution, or an idea in which I work on, are also useful-things, and so are other entities.

⁹ Ontic-ontological 'open space': in approximate terms it is the world of meaning and sense in which we are always already immersed in some way, as if we were in an outside that has not inside, since it corresponds to the 'clearness' or 'disclosedness' of existing; it is this "awakening" in which existence consists of. Only in this fundamental *a priori* we can understand or feel things and situations, be extroverted, emotional, thinker, or "simply live", etc., or it is also possible to

think about oneself, or have an inner or spiritual world, or also, to perceive the strange, the chaotic, the nonsense, or living the madness, etc. On the other hand, this ontic-ontological space is essentially ontological and is not partly ontic and partly ontological, for we can only perceive, treat, conceive, etc. the entities “by means” of their being. We incorporate ‘ontic’ in the compound word ‘ontic-ontological open space’, for existence can’t stop dealing with entities (however only “through” their Being).

¹⁰ For example, we will see that ‘others’ also make up our being.

¹¹ Characters

¹² ‘To let entities come to encounter us’ or ‘let them presentify themselves’ must be understood in an existentiell, preontological, and not ontic, meaning. It is not about a supposed action to allow entities to appear, or to give license for entities to be. Rather, it is a matter of “unfolding” the being by means of which we treat with entities, unfolding their meaning (which includes their possible insignificance, strangeness, or meaninglessness). But this unfolding is not an action. It does not mean that for some entity to have some degree of meaning for me (the ‘me’ of each one), that is, for me to perceive it as an entity, we must do the ontic action of unfolding its being at the same time that the entity does some action. This is not a mechanism. Everything is, so to speak, simultaneous and ontological, without being an action or two coordinated actions. Being and entity “happen” in unison, and that is part of the constitution of the disclosedness in which we consist of.

¹³ Along with this very summary characterization of being-in, we can add the following: As the being-in is directed to the world (‘being-in the-world’), and furthermore we-have-to be-in-the-world, the being-in is factually given in ways of being-in-the-world, in the way of dealing with entities, of dealing with other ex-sistences, with one’s own ex-sistence, in our behaviors, in speaking, in arguing, in being happy, in being in love, in being bored, in suffering, in resolving some matter, etc. In all this we are immersed in sense. Preontologically immersed *a priori* in the world. Consequently, in the ontological-existential direction that we want to take here, it is not about a spatial being-in in the manner of a “corporeal I” that is inside a room, and this in turn inside something else, and finally all within the cosmological universe. Ontological-existential being-in is more fundamental and originary and constitutes the *a priori* for positing spatiality as corporeal-geometric. As long as we exist, we have-to-be-in-the-world, there is no choice, no matter what our concrete decision in life is; and that is precisely why we can make decisions. In this destiny we always inhabit-unfold in a certain way disclosedness.

¹⁴ To put it in a simple, but approximate way: Understanding is to know myself existing and knowing how to exist by knowing my being, my circumstance, the being of the entities with which I deal, the being of others, etc., which implies knowing my possibilities of being and to pour myself into one of them at every moment. These knowledges are preontologicals and preconceptuals, and they allow me “to slip” through existence. This happens at all moments, even when we are factually lost or disoriented, because in that circumstance we interpret existence precisely as confusing, and we act accordingly.

¹⁵ Here ‘attunement’ is used for the German word [Befindlichkeit].

¹⁶ Moods are not just passing states that color experiences; even in the most indifferent monotony of existence we are 'affectively disposed' and existentially referred to a way of being-in-the-world. Thus, the monotony of routine, the repressed displeasure of daily occupation, and affective indeterminacy can show, patently, a kind of burden; the burden of our being consigned to existence and having to exist, facts that no knowledge can open up as patently as moods do. A heightened state of mind also owes this burden, for, in part, it frees from it, it relieves it.

¹⁷ That we, preontologically, "know", "live" in its being.

¹⁸ For example, we can use it (interpret) as a projectile against a sudden threat.

¹⁹ 'Co-being-in-the-world' and 'co-ex-sistence' can also be expressed as 'being-in-the-world-with' and 'ex-sist-with'. What is important here is that "co-" or "-with", do not refer in the first place to an ontic being together of several people with me, but that the 'ex-sistence' is constituted, ontologically, by 'other ex-sistences'. I may well ontically be alone, but I always continue 'co-being-in-the-world'.

²⁰ 'Care' is the translation of the German word [sorge], which also translates as 'cure'. We do not give it the usual meaning of caution, precaution or worry, much less of 'cares of life'. Rather, the latter are only possible in their being based on care as being of ex-sistence.

²¹ In its being, fear is different from angst, and they should not be confused (Heidegger, 1927a, § 30).

²² Here it is not that Heidegger's existential ontology is marked by a negative, funereal connotation and is a kind of depressing philosophy of death. This possible connotation arises from not understanding and accepting death as an inseparable component of ex-sistence. This rejection arises in our natural tendency to escape, to avert our eyes from the radical possibility of the end.

²³ Or provoking death or recklessly defy it.

²⁴ I myself cannot witness my death as an event.

²⁵ Heidegger calls this 'guilt', which is to be understood in a strictly ontological-existential sense, and not in its habitual usage.

²⁶ That is, 'a have been' that is "constantly acting in the existence".

²⁷ Which always consists in the disclosedness.

²⁸ This makes ontologically possible the concretion of the referential chain of the structure of the significance of the world, which configures part of the being of the useful-thing: 'for-the-sake-of a possibility of ex-sistence's being (being able to be, ahead-of-itself, coming to itself) towards the for this... useful for', and vice versa.

²⁹ This includes the encounter of the strange, the nonsense thing, and of the countersense.

³⁰ [Augenblick] is often translated as 'moment of vision' or 'the moment'. I prefer to translate it as 'clear instant' as it is an instantaneous present that can see the integral clarity of ex-sistence as it is.

³¹ We must forget ("turn our eyes away from") our existential situation as such in order to be genuinely immersed in what concerns us.

³² For example, not yet present (usual future) of a certain realization of my being, or of a result about an entity.

References

- Borrego-Varillas, R., Lucchini, M. and Nisoli, M. (2022). "Attosecond spectroscopy for the investigation of ultrafast dynamics in atomic, molecular and solid-state physics". Rep. Prog. Phys. 85 066401. DOI 10.1088/1361-6633/ac5e7f. <https://iopscience.iop.org/article/10.1088/1361-6633/ac5e7f>
- Deamer, D. (2011). First life. Discovering the connections between starts, cells, and how life began. Berkeley: University California Press. <https://www.ucpress.edu/book/9780520274457/first-life>
- Einstein, A. (1916). Relativity: The Special and the General Theory. (traduction by Lawson, R. W.). London: Penguin Classics, 2006.
- Grundmann S., Trabert, D., Fehre, K., Strenger N., Pier, A., Kaiser, L., Kircher, M., Weller, M., Eckart, S., Schmidt, L. Ph. H., Trinter, F., Jahnke, T., Schöffler, M. S., Dörner, R. (2020). Zeptosecond birth time delay in molecular photoionization, Science, 370, 339-341. <https://www.science.org/doi/10.1126/science.abb9318>
- Hawking, S. and Mlodinow, L. (2005). A Briefer History of Time, Ney York: Bantam Dell, p 68.
- He, L., Sun, S., Lan, P., He, Y., Wang, B., Wang, P., Zhu, X., Li, L., Cao, W., Lu, P. and Lin, C. D. (2022). Filming movies of attosecond charge migration in single molecules with high harmonic spectroscopy. Nat Commun 13, 4595. DOI 10.1038/s41467-022-32313-0. <https://www.nature.com/articles/s41467-022-32313-0>
- Heidegger, M. (1915). Der Zeitbegriff in der Geschichtswissenschaft. Gesamtausgabe (GA), Band 1, pp. 415-425. Frankfurt am Main: Vittorio Klostermann, 1978; English version by Taylor, H. S. and Uffelman, H. W., J. A. as "The Concept of Time in the Science of History" in Becoming Heidegger On the Trail of His Early Occasional Writings, 1910-1927. Edited by Kisiel, T. and Sheehan, T., Evanston, Illinois: Northwestern University Press, 2007; Spanish version by Escudero, J. A. as "El concepto de tiempo en la ciencia histórica" in Tiempo e historia. Madrid: Trotta, 2009, pp.13-38.
- Heidegger, M. (1924). Der Begriff der Zeit. GA 64., edited by von Herrmann, F.-W., 2004; English version by McNeill, W., as "The Concept of Time", Wiley-Blackwell, 1992; Spanish version by Raúl Gabás, R. and Escudero, J. A. as "El concepto de tiempo". Madrid: Trotta, 1999.
- Heidegger, M. (1925-1926). Logik. Die Frage nach Der Wahrheit (Zeit's Hauptstück), GA 21., edited by von Herrmann, 2004.; English version by Sheehan, T. as "Logic: The Question of Truth" (Part II), Bloomington: Indiana University Press, 2010; Spanish version by Ciria, J. A. as "Lógica. La pregunta por la verdad" (C. Segunda parte principal). Madrid: Alianza Editorial, 2004.
- Heidegger, M. (1927a). Sein und Zeit. GA 2., edited by von Herrmann, F.-W., 1977; English version by Mcquarrie, J. and Robinson, E., as "Being and Time", New York: Harper & Row, 1962; Spanish version by Rivera, J. E. as "Ser y

- Tiempo”, Santiago de Chile: Editorial Universitaria, 1997, and Madrid: Trotta, 2003.
- Heidegger, M. (1927b). *Die Grundprobleme der Phänomenologie*. GA 24., edited by von Herrmann, F.-W., 1975; English version by Hofstadter, A., as “The Basic Problems of Phenomenology”, Bloomington: Indiana University Press, 1988; Spanish version by Garcia-Norro, J. J. as “Los problemas fundamentales de la fenomenología”, Madrid: Trotta, 2000.
- Heidegger, M. (1962). *Zeit und Sein*, in *Zur Sache des Denkens*, GA 14, edited by von Herrmann, F.-W., 2007; English version by Stambaugh, J. as “Time and Being”, in *On Time and Being*, New York: Harper & Row, 1972; Spanish version by Garrido, M., Molinuevo, J.L. and Duque, F. como “Tiempo y Ser”, Madrid: Tecnos, 2009.
- Khabarova, K. (2022). Atomic clouds stabilized to measure dilation of time. *Nature* 602, 391-392.
<https://doi.org/10.1038/d41586-022-00379-x>
- Midorikawa, K. (2022). Progress on table-top isolated attosecond light sources. *Nat. Photon.* 16, 267–278.
<https://doi.org/10.1038/s41566-022-00961-9>
- Shorokhov, D. and Zewail, A. H. (2016). Perspective: 4D ultrafast electron microscopy—Evolutions and revolutions, *J. Chem. Phys.* 144, 080901. <https://doi.org/10.1063/1.4941375>
- SI, *Système international d'unités*, 2019. Bureau international des poids et mesures, Sèvres: BIPM, 9e edition, p. 130.
- Xie, X., Roither, S., Schöffler, M., Lötstedt, E., Kartashov, D., Zhang, L., Paulus, G.G., Iwasaki, A., Baltuška, A., Yamanouchi, K. and Kitzler, M. (2014). Electronic Predetermination of Ethylene Fragmentation Dynamics., *Phys. Rev. X* 4, 021005. <https://doi.org/10.1103/PhysRevX.4.021005>
- Zubiri, X. (1976). *El concepto descriptivo del tiempo*. *Realitas II: 1974-1975*, Trabajos del Seminario Xavier Zubiri, Madrid, pp. 7-47.