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THE MYSTERY OF TIME: A NEW SOCIOLOGICAL APPROACH

The social sciences are again talking about time. They venture to do so, because the crisis of meaning in which modern society is involved shows the narrow limits of the solutions to this problem of being that phenomenology has reinvented. Since meaning only exists in duration of time, the crisis becomes a crisis of time and a crisis of the representation of man in time.

Now this notion of representation is closely linked to the sociological view that investigates the reason men behave within a rationality that is not universal, as the positivists would have it, but temporary and specific to a situation. The advance of social philosophy thus passes from Reason to the reason for being and doing. However, by placing the actor at the center of the world stage it gives him the proof of his insignificance, because the conscious actor knows himself to be a prisoner of ways of imagining the world that both overwhelm him and give a meaning to his fragility. Furthermore, the world cannot be imagined outside of time; it is not a fossilized or mummified object, an annihilated subject like the dog tortured in a laboratory or a dissected corpse in a lesson

Translated by Jeanne Ferguson

on surgery. Without a doubt, the world is "everything that happens," as Wittgenstein expresses it, but for a sociologist it is so in the manner of the *Thlön* world of Borges, with its past and its future written and rewritten in the present. The disenchantment of the world that Max Weber believed inescapable finally finds its limits, and the moment has come to revive the corpse that the Durkheimians left us in the form of collective memory. In order to do this, however, we must begin with its rediscovery through one of its philosophic births, in the Kantian paradigm of time as "non-existent thing."

Time *is*, the only empirical statement that any man in his right mind can make, does not imply in any way that it flows, jumps, turns around, immobilizes itself or anything else that can be defined qualitatively. The only usable method for a sociologist is based on a Kantian *a priori*: it is in duration and not only in space that beings, objects or phenomena can be perceived.[1] Therefore, time permits forms to manifest themselves without any indication of their origin. These aspects of time are an immediate fact of consciousness, an elementary fact: child, adult, old person or the enigma of the Sphinx reminds us that this chronological division is an integral part of human nature. It appears to us "as already provided with a natural measurement, already cut into slices by the succession of seasons and days, by the movement of the celestial clock that provident nature had care to put at our disposal"[2] notes Alexandre Koyré, who shows, on the contrary, how much measurement in isochronic unities, that is, in sections of homogeneous and identical duration, is a fact against nature, an invention of scholars much more than of practicians, engineers or clock-makers.[3]

[1] "Time is a necessary representation that serves as a foundation for all intuitions." E. Kant, *Critique de la raison pure*, Paris, P.U.F., new edition, 1963, p. 61. Translated by A. Tremesaygues and B. Pacaud.

[2] A. Koyré, "Du Monde de l'à-peu-près à l'univers de la précision," *Critique*, No. 28, 1948, reproduced in *Études d'histoire de la pensée philosophique*, Paris, Gallimard, 1971, p. 353. Michel Serres takes up this idea in *Passage du Nord-Ouest*, Ch. "Espace et temps," Paris, Ed. de Minuit, 1980, pp. 67-83.

[3] We should note that the paradox of Zeno, a fundamental problem and thus destined to remain without a definitive solution, does not aspire to demonstrating the illusory aspect of spatial division. The illusion appears, according to Zeno, when this division is put into time.

Confronted with time is space, which we could believe is necessarily cultural and divisible, since it appears as a totality. Forms discovered by the child or measured by the surveyor are totalities full of meaning in themselves (a tree, rock or field), but they are not equivalent and only communicate, in a way, through measurement. Quantified information begins with the empirical need to distinguish units in stable spatial circumstances, invariably present. Because of this, the dimensions of length, width and height have always been expressed in the various known human languages. If someone describes to us, beginning with an autochtonous account, the palace of Ulysses, that of Chou-Hi or that of the president of France, we always know where we are. To explain this fact, there is no need to turn to a Platonic discussion on the innate nature of perfect forms: these forms have appeals that vary with peoples, but their experience in concrete space is always transmittable because it refers to an action within the environment, and all men, whatever their culture, have two legs, two arms and five senses with which to act.

I. From Imagined Time to real Time: the Future of an Illusion

It is quite different with time, because unless we use metaphors it is not possible to explain time that is passing. The way in which Homer constructed the temporal framework of his narrative seems very strange to a modern man, although the poem belongs to his patrimony.[4] Likewise, the book of Mutations (*Yi-King*) keeps the secret of its form; its cyclical appearance is actually deceiving since in Tao all periodicity collapses within a duration that is only a whirlwind. Bantu thought also appears unseizable when it unifies time and place and makes our "I think therefore I am" totally unintelligible,[5] since the verb "to be," an African author tells us, is always followed by an attribute or a circumstantial complement of

[4] James Joyce attempted a difficult transposition: "History is a nightmare from which I try to awaken" (in *Ulysses*, New York, Random House, p. 35).

[5] A. Kagame, "Aperception empirique du temps et conception de l'histoire dans la pensée bantou," in *Les Cultures et le Temps*, Paris, Payot, 1975, p. 112.

place: I am good, tall, etc... I am here in this spot, etc., so that "thus I am" would bring up the question, "You are what... where?"

Furthermore, how can we see clearly, even on a stable terrain like that of the calendar, when the Aztecs, Mayas, Balinese and many other cultures make a parallel use of the representations of time based on cosmic cycles as different as those of the sun, Mars, Venus or, the best-known of them, the sovereign Moon?[6]

Our civilization is the only one to have endowed itself with an absolute time that allows it to better situate things when it compares two moments, for example, that of the editing of the Vedas to that of the transciption of the Bible.[7] The mesh of chronology may tighten or loosen at will, but the entire world in its eternity is caught in it.

We are accustomed to attribute the invention of this time with its qualities of linearity and homogeneity to Leibnitz and Newton, although we can also go back as far as Aristotle and Plato.[8] Actually, this conception is not as original as is claimed. Numerous civilizations have had chronicles at their disposal, and we may think that this "modern" time was very often used as a local variety

[6] The Balinese use two calendars. The first is made up of ten cycles of names having a name from one to ten, the most important being those of 5, 6 and 7. The binomial conjunctions indicate the fateful dates (every 35 days for 576, every 42 days for 677, etc.) The wheel of time thus causes a sort of quantum of duration to reappear, units of 30, 35, 42 or 210 days, but there is neither a beginning nor an end to the year. The second calendar is solar-lunar. It is even more complicated and every 63 "real" days involves a curious catching-up of two lunar days for one solar day.

The Mayas superimposed three cylindrical projections: lunar, Venusian and solar. As for the Aztec calendar, it resembled that of the Mayas, with one divinatory year of 260 days that is also the result of a complex combination of several cycles. These three examples suffice to prove that the precise measurement of time is not an invention of our culture: it is something else that distinguishes it. See *Les Prophéties du Chilam Bayan*, a presentation of J. M. Le Clézio, Gallimard, 1976; *Time and Conduct in Bali*, Ch. 14, in C. Geertz, ed., *Interpretation of Cultures, Selected Essays*, London, Hutchinson, 1975; J. Soustelle, "Le Monde, l'Homme et le Temps," Ch. 3, pp. 122-147, in *La Vie quotidienne des Aztèques*, Paris, Hachette, 1955.

[7] For other *a contrario* examples, S. Brandon, *History, Time and Deity. An Historical and Comparative Study of the Conception of Time*, London, Nuppfield, 1965; and L. W. Doob, *Patterning of Time*, Yale University Press, 1971.

[8] For a recent status of the question, see H. Barreau, "Conception relationelle et conception absolutiste du temps et de l'espace-temps," *Arch. de Phil. Franc.*, 1980, No. 1, pp. 52-72.

of time. It served for the astrological block calendars or the genealogy of dynasties or, again, for establishing the events of origins.[9] However it never became dominant in mythical-religious representations shared by all. In Judaism itself it is the way in which God intervenes in human affairs that is new: He guides and directs by leaving a hope for future reconciliation, but the terms of the agreement are not as clear as they are in Christianity.[10] In effect, it is with this latter religion that a precise figure will be designed on the Judaic texture, that of an ascending line marked at the beginning and at the end by a rupture. From the Passion of Christ to the Second Coming, the accomplishment of the destiny of man occurs in a concrete duration. There again, the novelty is relative: instead of speaking of precise peoples and a particular end, Christianity develops in the name of all humanity and puts its march toward Redemption between two moments. Genesis opens the Old Testament and the Apocalypse (Revelations) ends the New Testament: the circle is closed.[11] However, if the morphology of the time designated by Christianity is relatively new, on the contrary neither the continuity nor the measurement are its basic ingredients, and the Apocalypse offers quite a different model from the evolutionist and linear one.

[9] This misconception of the polysemy of time makes J. Attali a prisoner of an evolutionist view similar to many others, namely, that of S. Toulmin and J. Goldfield, *The Discovery of Time*, Harmondsworth, Penguin, 1968; J. Attali, *Histoires du temps*, Paris, Fayard, 1982.

[10] A. Neher shows still more clearly than A. Heschel how the Jewish view is not soothing: there are "holes" in the world in acts, and improvisation accompanies Creation, the work of God but also that of the free man. Is there a more astonishing sentence than that which, according to Neher, the Rabbinical exegesis attributes to God at the time of Creation: "Let's hope this one holds up!" It is true that the "All-Powerful," still according to the same exegesis (Berecit Rabba, 9,4), had already tried twenty-six times and had failed each time. Cf. A. J. Heschel, *Les Bâtisseurs du temps*, Paris, Ed. Minuit, 1960, and A. Neher, *L'Essence du prophétisme*, Paris, Calmann-Lévy, 1972.

[11] There are innumerable writings on this theme. However, the subject is more directly treated and with more original variations by famous authors such as R. Niebuhr, *Foi et Histoire*, Neuchâtel, Delachaus and Niestlé, 1947; or P. Tillich, *Der Widerstreit von Raum und Zeit, Gesammelte Werke*, Vol. VI, Stuttgart, Evangelisches Verlagswerk, 1963.

The eternity that follows the "End of Time" is a portion of God's time; this latter is thus, here, well re-established in his omnipotence. Time is a transfinite known only to the Supreme Being. This is why interpretations such as those of Spinoza may finally result in the negotiation of human time.

When medieval philosophy entered into crisis, after the reading of Aristotle had permitted[12] the discovery of a new god, a measurer and, in a way, already a time-keeper, the thinkers of the new science of the classical century were content with taking away from this god one element of his omnipotence. To the great detriment of the theologians of the time, they attributed an absolute nature to time, while they extended the homogeneity of the post-Revelation period (*naire*) to the duration that goes from the creation of the world to its destruction. The rationalists were at the origin of another major deformation of the religious doctrine, which was characterized by a broadening and universalization of the temporal qualities through the affirmation that time could be apprehended through the displacement of matter. This idea also was not very original since the apparatus for measuring had existed for a very long time. From the sundial to the clepsydra, passing on the way the hypothetical clock of Antikythera of the second century B.C., the ancient world did not lack instruments that were sufficiently perfected for Galileo to prefer the water-clock to the clock for his experiments. It is therefore through theory that the local variety would emerge as a general form.[13]

Thus the apparent contradiction that is found in two often-quoted texts of the great chronologer St. Augustine is resolved. In the first, the theologian praises progress in a way that sounds strangely modern: "To what astonishing marvels has the industry of man not arrived in the art of clothing himself and constructing a dwelling? What progress has he not made in agriculture, in navigation?",[14] and he goes on to describe them. In the second, he evokes being and time in a way that anticipates German phenomenology and the Sartrian idea: "if someone wants to emit a rather

[12] Following E. Grevisse, *Le Bon Usage*, J. Duculot Gembloux, 8th ed., 1964, p. 1079: "The subordinate introduced afterward that expresses a past fact, registered in reality..."; the subjunctive is only used for the future "before..." because it indicates an uncertainty. Does the past then only leave uncertainties? This question is one of those that arises throughout this article, but it is interesting to note how modern grammar expresses its philosophical stand.

[13] See E. A. Burtt, *The Metaphysical Foundations of Modern Physical Science*, Routledge and Kegan Paul, London, 1924; G. Bohme, *Zeit und Zahl. Studien Zur Zeittheorie bei Platon, Aristoteles, Leibniz und Kant*, Frankfurt, Phil. Abhandlungen, 1974.

[14] St. Augustine, *La Cité de Dieu*, Book XXII, Ch. XXIV.

long sound... he meditates on its duration, confides this calculation to his memory and then only does he emit the sound... this sound has vibrated, it will vibrate, because what has passed has vibrated; what remains will vibrate and so it is that it is completed, while the present action transmits the future to the past, which increases with everything the future loses up until the moment when, the future being exhausted, everything is the past."[15]

According to Robert Nisbet, the first text establishes the proof that for the Christian West in the early centuries change is directed.[16] In reality, this is true only if we understand that this progressist idea is perceived as autonomous, as limited to a zone of evolution. Thus it has no meaning and concerns only one aspect of human reality "up until the moment in which the future (desired) being exhausted, everything will be only the past." In short, the commentators of St. Augustine are sufficiently numerous[17] for us not to add our little-qualified interpretation here; let us simply repeat that the notion of local variety of time, brought up to date by contemporary physicists, was already part of the natural and daily representation of the archaic Christian world.

As for what we may call the materialist metaphor of time, let us recall that Benjamin Lee Whorf, in his famous works on the Hopi Indians, compared the status of temporality in Standard Average European (S.A.E.) with that which the Hopi language attributes to it. In what Whorf calls the S.A.E. microcosm "things" are "endowed with expanded modalities of life, but also informal, designated with the name of substance or matter," so that "non-spatial entities are spatialized through the imagination that attributes to them a form inscribed in a continuum in the image of the material world." On the contrary, Indians analyze the situation from the angle of "events" (or better, phenomena *in actu*) envisaged under a double aspect, objective and subjective."[18] The socio-linguist

[15] St. Augustine, *Les Confessions*, Book XI, XXVII, 35, translation P. de Labriolle, Budé.

[16] R. A. Nisbet, *Social Change and History*, New York and London, Oxford University Press, 1969.

[17] For a recent scholarly commentary see P. Ricoeur, *Temps et récit*, Paris, Seuil, 1983.

[18] B. L. Whorf, *Linguistique et Anthropologie*, Paris, Denoël-Gauthier, 1969, p. 96.

continues by explaining that "entities do not enter duration in the same way; for some, it is by growing the way plants do, for others by dilution and dissolving, for still others by undergoing a series of metamorphoses. . .", consequently "it is in the nature of each entity. . . to possess its own mode of duration: growth, decline, stability, cyclic rhythm or creative power."[19] This representation is difficult for a Westerner of the twentieth century to grasp, because the dividing of the present that constantly marks the passing of time for us no longer exists; everything is already prepared to manifest itself in a present form through preliminary phases. Whorf concludes that for the Hopi this corresponds to the "quality of reality that matter or substance has for us."[20]

The Hopis are seen to be as good metaphysicists as the German phenomenologists. Perhaps also the genius of the latter, as seen in Husserl or Heidegger, was to throw new light on the inability of the language of occidental consciousness to assume the problem of the temporalization of the being, that is, of evolution. Let us keep the lesson of the Hopis in mind: it will be useful to us later. Now, let us go back to a more classic approach so as to try to specify what the movement in time is in our tradition. Then we will take up the problem of the sociological nature of evolution.

Lived time and the measurement of time

Lived time is an immediate fact as contrasted to measured time by the absence of limits and guideposts. It is without beginning and end and is distinguished from the second as the feeling of heat is from heat. The Occidental originality was the search for the shortest possible moment and the endeavor to find instruments of measurement to do so. The Ancients, with divinitory intention, also achieved remarkable results by observing the movement of the great celestial bodies. The Mayan calendar, for instance, lost only two days in 10,000 years, while the Gregorian marks an advance of three days for the same lapse of time. But the construction of machines able to bring about shifts of very weak amplitude allowed

[19] *Ibid.*, p. 97.
[20] *Ibid.*, p. 98.

a change of place of the time-space conversion. From the discovery of the isochronism of pendulate oscillations by Galileo and Huyghens was born modern clock-making, although Newtonian physics had already founded, in theory, this infinitesimal partitioning of duration.[21]

There is no need to specify that a movement is "in time" since any spatial displacement implies a duration. Besides, it is this observation that, once inversed, gives the key to the measurement of time. With a few differences in detail (but with insuperable gulfs if we return to the initial hypotheses) all the thinkers about time concur on the following three points:

a) the daily experience of the continuity of space makes any verification of the continuity of time impossible;
b) when we maintain that we are measuring time, it is space that we are measuring (Bergsonian form of a classic proposition[22]);
c) duration is only perceived in relation to another duration.

From this point of view, the new temporal paradigm inaugurated by Einsteinian relativity has changed nothing. We are going to show why this is true, and we will then reconsider the Durkheimian intuition of time as representation.[23] This intuition may be developed today in a sociologically radical manner, due to the conceptual contribution of phenomenology. From this fact, social time is no longer one time among others, it is time with the others; the problem of evolution is thus entirely transformed.

[21] Newton's definition is always surprising: "Absolute time, true and mathematical, without relation to anything exterior, flows uniformly and is called duration... it is quite possible that there is no perfectly equal movement... but time must always pass in the same way", I. Newton, *Principes mathématiques de la philosophie naturelle*, translated by the Marquise du Chastelet, Book A, Paris, Blanchard, 1966, Vol. I, pp. 8 and 11.

[22] For example, see H. Bergson in *Durée et Simultanéité*, Paris, P. U. F., 7th ed. "Comment la durée devient mesurable," p. 49 *et seq.* O. Costa de Beauregard poses it as "the first principle of the science of time," in *La notion de temps*, Paris, Hermann, 1963.

[23] According to F. A. Isambert, in reality it is Henri Hubert who is at the origin of this intuition. See F. A. Isambert, "Henri Hubert et la sociologie du temps," in *Revue française de sociologie*, No. 1, Vol. XX, 1979, pp. 183-204.

II. From True Time to Evolution

Relativity: is there a relative objectivity?

The argument of Albert Einstein on the relativity of points of view in time was a common-sense truth well before it became a mathematical formula. There are innumerable dicta concerning the shifts of perspective according to the place of observation, and sceptics like Montaigne or Lucretius taught us long ago that any truth changes with time. Pascal's aphorism, "truth on this side of the Pyrenees, error on the other side," metaphorically states a principle that is valid for the entirety of human knowledge, including that of chronology. And the German scholar[24] makes us discover a sort of "Pyrenees of time," or at least one of the numerous ranges that mark epistemological points of rupture.

It would therefore seem paradoxical to affirm that the non-existence of an absolute time could just as well serve a materialist doctrine as an idealist philosophy, if this were not one more proof of the relativism inherent in human knowledge. For the first, in fact, Einstein's theory creates conditions for an "objective" apprehension of the cosmos, while for the second it allows a conception of the Spirit deployed in the spatio-temporal bloc! Thus, S. Amsterdamski does not hesitate to proclaim that "the theory of generalized relativity, whose name is in this regard a paradox [*sic*] poses as a principle the absolute value of the laws of nature whose truth appears to any cognizant subject, and the transcendence of the subject ceases at the same time."[25]

For Olivier Costa de Beauregard, on the contrary, the growing entropy of the universe is the expression of an information that is constantly broadened by consciousness: "What happens," writes

[24] Einstein made a relativist prophecy on this term in 1933 which unfortunately came true: "Here in Germany I am considered a German scholar and in England a Swiss Jew; if things change I will be considered a Swiss scholar in Germany and a refugee German Jew in England."

[25] What a strange aberration it is to define through science a transcendant Absolute and refuse to the Being that produces knowledge—that science—all transcendental capacity! According to Merleau-Ponty, this question of the status of "universal spectator" was ably put to Einstein himself by Bergson. See M. Merleau-Ponty, *Signes*, Paris, Gallimard, 1960, p. 247; S. Amsterdamski, "The evolutions of Science," in *Diogenes*, No. 89, p. 52.

the philosopher-scholar, "through and at the cost of the negentropy of the cosmos which is disintegrating is the information of psychisms incarnate in matter."[26] However, sociology draws only one lesson from this question, important, it is true: if relativity preserves and reinforces the notion of local time, it becomes all the more legitimate to imagine the presence of a time proper to the consciousness of the historical subject, a time that gives meaning to its acts and to those that occur in its immediate vicinity but maintains this meaning within very narrow limits.[27]

Minkowski's cone summarizes relativist propositions on this theme, propositions that have a bearing on the space-time equivalent but leave intact the phenomenological experience of duration. It is the equivalence $E = mc^2$ of the relativist conception that troubled men and filled the makers of bombs with enthusiasm much more than the idea that time was not the same for all. As Poincaré thought, the present time of Sirius has some interest for the possible inhabitant of Sirius, but for us the light-years that separate us from it are only an abstraction with no meaning, except in theory.

In addition, each of the time scales used by cosmologists or physicists produces its own proper object, and it is in this sense that we may say relativist mechanics are no more true than Newtonian mechanics. The proof of this is given us by a geologist who describes the objects "wax" and "rock" in their durations:

> "By analogy we may take a familiar example, that of sealing wax, whose physical properties are modified without the need for a great change in the time scale. Observed for one minute, sealing wax obeys laws of the breaking

[26] In O. Costa de Beauregard, *Le Second principe de la science du temps*, *op. cit.* p. 133. See also the more general but very pertinent critique of D. de Rougemont, "*Information is not Knowledge*," in *Diogenes*, No. 116.

[27] This is what essentially distinguishes the propositions developed in the present article from those of Costa de Beauregard. See also J. Earman (ed.), *Foundations of Space-Time Theories*, Minnesota Studies in the Philosophy of Science, Minneapolis, 1977; and the theses of J.-M. Lévy-Leblond that see the invariability of the speed of light as a result of a theory and not the experimental foundation of the latter in *La Recherche*, No. 96, 1979; and *American Journal of Physicists*, No. 3, 1976; No. 47, 1973; No. 48, 1980.

> point of solids with a threshold of rupture or cutting that is easily measured, but seen on the scale of months or years, this same wax is a viscous fluid that is plastically deformed under its own weight (. . .)[28] We have tried without success to explain foldings and overthrustings, basing ourselves on experiments and measurements of 'resistance of matter' made by engineers on a time scale that is necessarily that of daily life; (. . .) while (. . .) the hardest rocks, observed on the scale of a million years react like fluid plastic matter, able to flow even under very weak pressure; their breaking point, if it still exists, becomes infinitesimal and negligible."

That is, still according to the same geologist:

> "The physical properties. . . of a certain material, those that govern the mechanism of its deformations, are essentially variable according to the time scale used to consider the material."[29]

In short, Einsteinian relativity is only another way of saying that time is proper, not to the object or phenomenon, as is sometimes naively written, but to interrogation, that is, to the relation of meaning between a perceived reality and the one who perceives it. This is why cosmology refers not to past time but to a present model, based on modern thermo-nuclear knowledge, and of a potential physical reality, when it describes the beginning of the universe. Just as the Shaman could do it, thanks to myth, or the

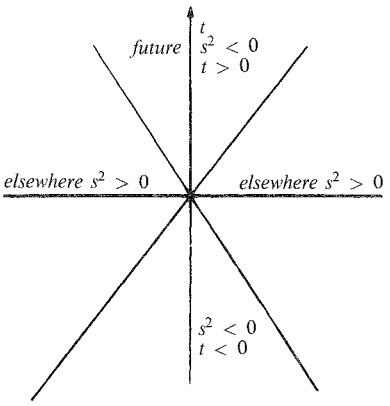
[28] Descartes had already used this example in *Les Méditations*, second meditation in *Oeuvres philosophiques*, Paris, Garnier.

[29] In F. Meyer, *Problématique de l'évolution*, Paris, P.U.F., 1954, p. 87. This negligence on the subject and its scale, that is, of the universal spectator (Note 26) renders Eastern and Western scientisms absolutely homologous. Quite recently, a review that seems to defend the official point of view (in the East and in the West there exist a scientific and a vulgate doctrine) informs us that "one can glimpse the realization of a dream. . . These progresses in science reveal the Universe as beautiful and simple at the same time. . . Natural phenomena appear to us as the manifestation of principles that harmoniously control the order of things"; and, further on, "The last frontier of our knowledge may one day be extended to Time Zero, the moment of Creation itself." J. S. Tréfil, in *Dialogue*, No. 63, 1, 1984, Washington-/American Embassy at Paris, pp. 10 and 15.

Brahman, thanks to the Vedas, the latter being a partisan of continuous creation through the breath of Brahma. At the moment of the supposed Big Bang, there was no time scale, and the intelligence that could have observed the phenomenon had no indicators, or its indicators could only remain incommensurable with regard to ours.

Now, this need for a social and historical subject, in the intelligible manifestation of time that thus becomes an operatory field, is forgotten by the very ones who speak of a demiurge chronos or a sociological chronos. We will give but two examples.

THE SPACE-TIME CONE



$s^2 = x^2 + y^2 + z^2 - c^2 \cdot t^2$

"Deprival of any absolute character and a physical equivalent with space are the two profound changes that relativist mechanics brings to the notion of time introduced by Newtonian mechanics," in A. Pacault, C. Vidal, *A chacun son temps*, Paris, Flammarion, 1970, p. 23.

Temporal tripartition: where is objectivity?

The first case is none other than that of the conception that seeks to establish the transcendence of human evolution. In this Biblical view, man finds his place alongside nature, since the three tempor-

alities represent a decreasing degree of objectivity. In fact, we find this hierarchy in it:

—cosmological time
—historical time
—existential time.

This tripartition is the exact copy of that of the gnostics and of which Henri Corbin describes an Iranian variation:[30]

1. opaque time: physical subjects succumbing to the control of the senses (*Zamân kathif*);
2. subtle time (*Zamân lathif*), duration of spiritual movements produced by spiritual beings (*Malakut*)
3. still more subtle time (*Zamân altaf*) of superior spiritual entities (the world of the *Jabarût*) the cherubinic intelligences.

Thus in an inverse order we again find the three preceding degrees, but this time there is a corresponding subject at each level that is presented as having a social and historical nature. The religious origin of the three times of the first hierarchy thus leaves no doubt, but it retains only its skeleton. Cosmological time becomes the one of "science without conscience" that fills the eternity of its present. The time called "historical" evades the question of the reality of the past: how can the measurement of the succession of events that change according to the infinite diversity of points of view be made operational? Existential time takes up the problem at its origin, but devitalizes it in a psychologism of the lived.

In fact, this tripartition must be "leveled off" in some way: the status of each of these times differs from the other only by its field of application. Each of the categories is operative for each of the

[30] H. Corbin, *En Islam iranien*, Paris, Gallimard, 1970, p. 168. This time, representative of the gnostic model, is more precisely that of the Persian mystic Qâsi Said Qommi. To show both the essential identity of these three categories and their incommensurability, Corbin adds apropos of the third time—the most subtle—that it is to it that the verse of the Koran refers speaking of the degrees through which "the angels and the spirit mount toward him in a day whose duration is 50,000 years." (Koran, 70:4) It is also the symbolic cycle of Ismaelian theosophy. The modern conception is no doubt rooted in the Thomist trilogy *tempus, aevum, aeternitas*. However, this doctrine imitates the gnostic thought in order to combat it more effectively. "Absolutely subtle" time, especially, is only the unknowable duration of the pleroma that the Spirit will one day rejoin in disengaging itself from the absurd *tempus*. It is not always so clear, even in H. C. Puech, *Le Temps de la gnose*, Gallimard, 1978.

subjects making the observation in the milieu that is proper to it: astronomers, historiographers, psychologists (to simplify). But none of these times is more objective or more real than the others: their reality is that of the operation they permit.

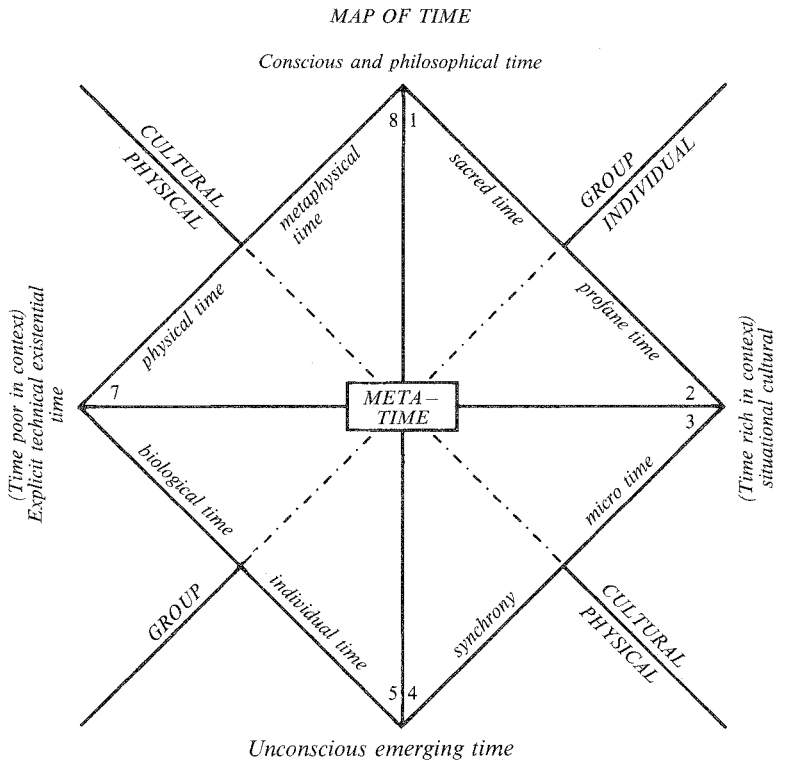
Sociologism of time and epistemological ingenuousness

In quite another perspective is inscribed the division based on specific temporalities supposed to correspond to various phenomenological realities. It is the heuristic point of view used by numerous and at times excellent works on time, such as the treatise on popularized philosophy by Jean Pucelle[31] or the book by Whitrow, *The Natural Philosophy of Time*,[32] a veritable Bible on the subject. It frequently happens, though, that this point of view distinguishing between mathematical time, geological time, historical time, and so on, is presented as an absolute frame of reference in which each of the times has its own value, independent of itself or the view it has on the object. We will give two recent examples, one of a famous popularizer of trans-cultural sociology, E. T. Hall,[33] the other of a "time researcher" who has achieved a certain fame, John T. Fraser.[34]

In his work, *La Danse de la vie—Temps cultural, temps vécu*, Hall offers a classification in eight categories: biological time, individual time, physical time, metaphysical time, microtime, synchrony, sacred time, profane time, with in the center the metatime represented in the following schema.

It seems unnecessary to detail each of these "times" that the author is wary of defining and content to illustrate; thus, "microtime" recently identified and still little recognized is the temporal system proper to the level of primary culture of which it is a product... Monochrony and polychrony are two of the most important forms

[31] J. Pucelle, *Le Temps*, Paris, P.U.F., 1972.
[32] G. J. Whitrow, *The Natural Philosophy of Time*, London, Nelson, 1961.
[33] The author of "*La Dimension Cachée*, E. T. Hall, *La Danse de la vie—Temps cultural, temps vécu*, Paris, Seuil, 1984.
[34] Due in part to the work of J. Attali, *La Figure de Fraser*, Fayard, 1984.



To consider complementary systems it is necessary to mention metatime, the level at which the concepts integrating all these dimensions of time are located (E.T. Hall, *op. cit.*).

of microtime."[35] In a later chapter, we learn that the Nordics are monochronic while the Mediterraneans prefer polychronism, without however reaching the level of the polychronic champions, the Hopis!

We are far from B. L. Whorf's analysis of the Hopi temporal expression. Whorf, in effect, inquires into the manner in which

[35] "Polychronics" may do several things at once, that is, it reunites in its *present* the time of diverse phenomenological series (for example attend to business, talk politics, appreciate wine). On the contrary, monochronics acts in a homogeneous time.

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these Indians conceive the evolution of things and beings and succeeds in reconstituting the texture of their view, while Hall uses his linear representation and "chronological" metrics to identify, differently from the dominant custom in the West, various "time-tables." In addition, confusion is at its height when he states that "metatime comprises all that the philosophers, anthropologists, psychologists and others have said and written with regard to time... here it is not a matter of time in the proper meaning of the term [*sic*] but of an abstract entity, constructed from different temporal phenomena."[36]

John T. Fraser's endeavor to describe the various levels of autonomous temporality that, according to him, are stratified in nature seems more interesting to us. Taking up the idea of Jacob Von Uexküll in which each species defines its universe, its *Umwelt*, Fraser extends it to objects in their temporal envelope by attributing to them a specific mode of existence.[37] Thus, the first temporal level groups those whose phenomenological appearance is extremely brief: less than twenty-thousandths of a second, specifies Fraser. This atemporal nature comes from the fact that it is impossible to envisage a succession of phenomena in this case, because there are not isolated entities. This is the situation with electro-magnetic waves. As soon as the entities become distinguishable—elementary particles, for example—we enter the proto-temporal world in which the durations of appearance are on the order of 20-50 milliseconds. According to the author, the dawn of time, the eo-temporal, has a duration of about 130 milliseconds.[38] It thus becomes possible to classify before and after, to establish a succession and to break the temporal symmetry, even though past, present and future are not yet meaningful concepts. Then the emergence, with phenomenologically superior durations, of the present as a point of reference and anchorage for reality, permits life to organize itself by creating regular cycles in which the past

[36] E. T. Hall, *op. cit.*, p. 38.

[37] John T. Fraser, *Time as Conflict*, Basel-Stuttgart, Birkhäuser Verlag, 1978; Jacob Von Uexkhüll, *Streifzüge durch die Umwelten von Tieren und Menschen*, Rowolt Verlag.

[38] J. T. Fraser, in *Of Time, Passion and Knowledge*, New York, G. Braziller, 1975, pp. 438-39.

intervenes in the future through the intermediary of the present. Finally, the human being, capable of conceiving the future, innovates at the noo-temporal level. He thinks of himself as within time and thus tries to dominate it.

Each level of temporality is thus accompanied by an *Umwelt*, by a universe to which explanatory principles and the systems of actions that are proper to it correspond. In the atemporal world, causality is a concept without meaning: only the probability of existence is recognizable. At the higher level, *eo tempore*, a determinism based on a principle of action-reaction explains this reality. With bio-temporality appears the idea of a goal. Causal orientation then distinguishes between simple interrelation and intention in the analysis of change. In short, noo-temporality introduces free will into evolution.

In this hierarchical structure, evolutionist presuppositions are manifest and lead the author to say, "the presents are more and more precise as one goes up the scale of evolution," or, "in the young child and in primitive societies, as in lower *Umwelts*, the bond between phenomena is not independent of the intention; they are not yet differentiated"[39]—that is, cause and project are not distinguished.

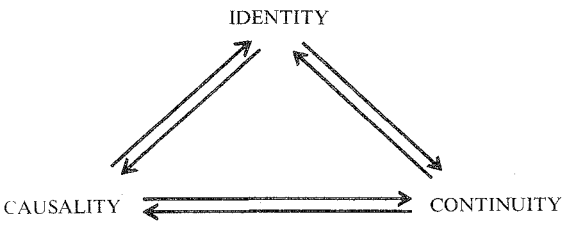
Let us leave them aside, because the subjectivity of the author establishes a notion of duration, the real and presence in the world that is extremely debatable. There cannot be a human *Umwelt* that allows a distinction between the moments that last long enough to introduce a succession and those that, too brief, do not allow time to be manifested (those below two milliseconds). Aristotle tells us, "Time will always be in the act of beginning,"[40] and Montaigne recalls us to humility... "Why does that moment which is only a lightning-flash in the infinite course of eternal night and such a brief interruption of our perpetual and natural condition give us the right to claim that we exist?"[41] Each event like each being in its destiny has a measure of duration, and Fraser takes the discourse of human science for a discourse on the objective real, while it is only a thesis on nature.

[39] J. T. Fraser, *ibid.*, pp. 438-39.
[40] Aristotle, *Physics*, IV, 13.
[41] He adds, "Death occupying all the before and all the after of this moment and *a good part of the moment*," (our underlining), in *Les Essais*, II, XII, ed. Villery.

The attempt at hierarchization of phenomenological durations must not for all that be rejected, since the proposition that interests us, and that is well-constructed, concerns the autonomy of levels, those times around which we want to develop our remarks. The description of time as place of a conflict implies that beings, caught in the trap of existential duration, solve the problems posed by changes in environment by changes in their own perception of time in agreement with their representation of the world. Each culture that elaborates its *Umwelt* but, perhaps also each group that acts intentionally, is thus located between a moment of origin and a moment of end in which it will pass to another *Umwelt* or another project.

On the other hand, this time of the world is the time of man. It is a matter of the essential sociological postulate—some would say sociologist—of the existence of a unified field: the thing is perceived in duration as the subject perceives himself; any coherent construction of the world occurs in time, in a time. Behind the distinctions between historical time, individual time, biological time, physical time, and others, emerges a representation of the metrics and topology of duration in collectively lived space, that is, in human space.

Modern time owes its existence to postulates on the objects that people the universe: notions of causality and preservation of the identity of beings through duration permitted the emergence of continuity and *vice versa* in a classic circuit of retroaction. This ensemble forms an ideological whole, a paradigm, rather, that permits no break, a paradigm that Kant had well understood, since for him the principles of substance (linked to identity) and causality are inferred from the three modes of time: permanence, succession and simultaneity. This is why the "basic triangle" of standard European typology of time is represented in this way:



Natural sciences could claim a legitimacy from the fact that their system of the world functioned in a *Zweckrationaltët*, a rationality of ends in which causality was restricted and one-dimensional. This succeeds locally; progress toward more accuracy and probability is rather easily measured from the moment in which the objective is determined (if I want to go faster or go to the moon, the measurement of progress is simple.) Even if the limits of validity of knowledge remain blurred and continually fluctuating[42] (for example, in the physics of particles, genetics, cosmology, etc;) experimentation and repetition insure a strong internal coherence for a large number of these sciences.[43] Now, the two conditions—experimentation and repetition—impose an arbitrary time that social sciences cannot assume (of which evolutionism).[44] The connections of the above trilogy are weak, because they are located, at an infinitely higher level, in a *hypothesis* in which forms are made and unmade according to the points of view in space and time.

III. Time and Evolution: The Emergence of a New Paradigm

The new temporal paradigm that emerges from this ensemble of reevaluations is closely linked to a new formulation of the role of disorder in society and nature in its entirety.[45] The vagueness of situations lived in the present go back to a representation of time in which time appears as a continuous creation of the observer, who sets up a temporality to serve his own interests.

This relativism could seem excessive if we did not take into account the essentials of its content, namely, the recentering on

[42] For example Benjamin Gal-Or, after having distinguished four schools of thought on the subject of the irreversibility of time, concludes that "the problem incorporates issues in it that are far beyond our reach now as in the early days of thermodynamics." B. Gal-Or, *Science*, No. 4030, 1972, p. 11. See also R. Lestienne, *Unité et ambivalence du temps physique*, C.D.H.S., 1979, B.N. 16° R 20056.

[43] Even though Karl Popper has greatly weakened this condition of objective knowledge, the other condition "everything being equal" creates the necessity for a virtual experimental reproduction.

[44] See A. Gras, "*Time of Evolution and the Spirit of the Times*," in *Diogenes*, No. 108, 1979; and *Sociologie des ruptures*, P.U.F., 1975.

[45] R. Boudon, *La Place du désordre*, P.U.F., 1984. For nature, see I. Prigogine and I. Stengers, *La Nouvelle alliance*, Gallimard, 1980.

the present. Furthermore, these arguments are only relatively new, since they bring to light again Augustinian representations that were rejected by modern rationalization or maladroitly reinterpreted, especially by Bergson. That is, precisely, "One could not say (*nec proprie dicitur*) that there are three times, past, present and future, but perhaps one would be correct in saying that there are three times: the present of past events, the present of present events, the present of future events. Actually, these three things are in the mind, and I do not see them anywhere else: the present of the past, or memory; the present of the present, or intuition; the present of the future, or expectation (*expectatio*)."[46]

This discourse contains a proposition that is relatively new but of increasing importance, since the social philosophy of change that accompanies it stresses on one hand the local configuration of a weak determinism and on the other takes on the characteristics of a reflection that quickly grasps the glimmering of the social in its most fleeting aspects, so as to give them a meaning that goes beyond them.

The conjunction of the critique of logical empiricism from across the Channel, beginning with material furnished by this empiricism itself (which proves its heuristic value) and of the retreat from certainties, to the profit of what the new Italian intellectual generation calls "weak (theoretically) thought"[47] today gives sociology the means of renewal. The mirror of the identity-continuity-causality triangle, in particular, shatters and gives place to a thought, indeed, to a labyrinthine temporality in which evolutionist historicism is trapped, along with its homogeneous and unitary metrics of duration.

In this conjunction, the idea of time itself, already used in chronobiology and physics and explored in sociology since the

[46] St. Augustine, *Les Confessions*, Book XI, Ch. XX. E. Cassirer discusses its philosophical reasons adduced and apropos of the duration of sound, anticipates the critique of a certain historical category by explaining: "The determination of time does not enter into acts, but it concerns their intentional projection" in *La Philosophie des formes symboliques*, Paris, Minuit, Vol. III, p. 194.

[47] G. Vattimo and P. A. Rovatti (under their direction) *Il Pensiero debole*, Feltrinelli, 1980. In France, the sociologist Michel Maffesoli represents this tendency and opposes "formism" to "formalism". See M. Maffesoli, *La Conquête du présent*, P.U.F., 1979; and "La démarche sociologique" in *Revue européenne des sciences sociales, Cahiers Vilfredo Pareto*, Vol. XIX, pp. 325-39.

fifties must constitute a pivotal notion.[48] The development of the phenomenon, in fact, cannot be conceived except through relation to itself, but it only takes form, that is, meaning, in one's view of it.

In conclusion, let no one believe—as is the custom for the sycophants of "true" knowledge—that the social sciences copy relativity or thermodynamics, because we have long known that time is only a representation in itself, and that reality takes form in the eye of the painter or the scholar. It was "time," therefore, that these forgotten banalities again became knowledge, and even "*gai savoir*".

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[48] It is interesting to note that there were few sociologists until recently who pondered on this aspect of the imaginary construction of reality. However, P. Sorokin proposed in 1949 a critical reflection that G. Gurvitch also began in France and that in his wake G. Balandier continued. It is with a great deal of difficulty that a new comprehension of "modern time" thus emerges, finally taken as an ethnographic object. See P. Sorokin, *Space, Time and Causality*, Russell and Russell, No. 4, 1949; G. Gurvitch, *La Multiplicité des temps sociaux*, in *La Vocation actuelle de la sociologie*, Vol. II, P.U.F., 1965 (course of 1958); G. Balandier, particularly *Sens et puissance*, P.U.F., 1971; and *Anthropo-logiques*, P.U.F., 1974.