PERIODICA POLYTECHNICA SER. HUM and SOC.SCI. VOL. 3, NO. 1, PP. 33-44 (1995)

REFLECTION AND QUESTIONS CONCERNING THE INTERPRETATION OF NATURAL AND SOCIAL SPACE-TIME

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Received: July 11, 1994

Abstract

Is space-time identical with the scientific concept of space-time? These days there is an overwhelming demand for finding the most general philosophical interpretation of space-time. In our view the natural (physical) and social concepts of space-time can mutually enrich each other and simultaneously raise a series of new questions: namely, whether reversibility or three-dimensional character are universal features of space-time; and whether reversibility can be interpreted in a new way: as time turning into space and vice versa.

Keywords: object-subject relationship, natural space-time, social space-time; time-likeness of space-time, space-likeness of time, universal feature

1. Scientific Concept of Space-time

The reason why integral natural science and general social science being on the same level did not burst forth from the accumulated knowledge at the same time and with the same intensity in the history of European culture can be found — in my view — in Man's ambivalent state of existence.

If we look at the history of the development of human culture up to the 17th century it becomes clear that the foundation of all this development is the development of the working Man, of the working activity of Man, of his tool-making and technology, etc., the process in which Man gradually grew more and more independent from Nature and separated himself from it. The development of the relatively integral European natural sciences was preceded partly by the birth of local societies, of local sciences, of the view of local space and time and later by their homogenization, which on the other hand meant their destruction as well. In the background of the radical change of local world-views there was the unifying world-view of Christianity. Another important condition of the appearance of integral natural sciences was the fact that Man, having be-

come relatively separated from Nature, became capable to observe it as an object. Thus in the concept and interpretation of the relationship of Man and Nature the subject-object view could become dominant and it has become an organizing principle as well. The accumulation of scientific information separated from everyday work and life activity, which could be comprehended as objective in contrast to Man, necessitated the 'discovery' — finding — of uniform organizing principles. On the other hand in the age of the Enlightenment, in the age of human particularization, individualization, emancipation from the integrating community there emerged a necessity for the human subject to appear as the counterpart of the objective world around him. With the weakening of the hegemonic world-view of Christianity the human subject, which wanted to find its way in the ever expanding natural and social world revealing its relations, *searched for a new, secular reference system. He found that first he had to become himself* and then had to ignore his own particularity so that these organizing principles could become uniform, so that the reference systems could become convertible and could claim universality. Thus in the local community the particular individual became gradually separated.

By the beginning of the development of the capitalist society the individual as a natural being had become a subject in his relation to Nature by gradually being particularized in the community and by separating himself from it *but as a social being he still had not detached himself from the communities given by Nature.* He was tied to them. For him the feudal communities were both the scope and limits of his particularity so he was forced to apply them to himself. They provided his relations to Nature and to other communities. The categories of absolute space and absolute time could be born for this Man only, who had 'in this way detached himself' from Nature but who looked for a reference system in the feudal society because it had a meaning only for him.

The *Newtonian theory* of absolute space, absolute time, absolute motion, etc. is therefore a top intellectual performance of the Man who detached himself from Nature, observes Nature as an object and who *is in a multiply indirect relation with Nature*, who is particularized *but is closely tied to the feudal relations of this society*, who observes society as his own feudal subject.

But with the birth of the categories of absolute space and absolute time, the motion- space- and time-concept of natural and social sciences have detached from each other. One can even say that the concept of abstract absolute motion, space, time, etc. of natural sciences could not be

complemented by the concept of abstract social motion, space, time, etc. because this latter did not even exist.

The elaboration of the scientific concept of motion, space and time has been going on in natural sciences relatively autonomously although from time to time dialectics compare the laws of change and motion with the new experiences gained in studying natural change and motion. A solid ground for this: no matter to what extent and degree does society become detached from Nature, it remains natural, therefore e. g. the physical, chemical motions, physical and chemical space/time, etc. are the same in the society as in Nature. Therefore the natural being of the society made possible the extrapolation of the scientific concepts of motion, space and time to society (which in our view is not always well-grounded). Nearly two centuries had to pass before the economic and the total development of the political and economic systems of the bourgeois society made it possible for the individual to look at his own society as an object as well. At the same time it became imperative that society be comprehended as a unified, organic system and social motions and within them economic and political ones be characterised and grasped in their essence.

With the help of the *categories of the mode of production* and of *the economic social formation — which were elaborated by Karl Marx* — in the forms as they are used even today — the abstraction of social motion, the general description of societies with different modes of production has become possible. With the introduction of the Marxian category of the economic social formation, the basic category system of the social whole, the structure, dynamics, i. e. the motion of the parts of the society in general became comprehensible for everybody. With the help of the category of the economic social formation the abstract mode of production as opposed to the particular and individual modes of it, i. e. its system of relation, i. e. *social space-time can be defined.*

Despite the fact that Marx never identified the concept of the economic social formation formally with the category of social space-time, it is relatively easy to prove that the content of the two categories is identical. As all social space and time parameters of concrete social lives are summarized in the category of the concrete economic social formation, the most general abstraction of concrete social processes of production, existing in local space and time is the social space-time that can be isolated from them in the general category of economic formation.

With this the *conditions of the emancipation of the social theory from natural sciences* were created once and for all.

In the 19th century the former disparity in the development of the two spheres of science disappeared for a moment but only to re-appear soon. Since social theory by its own nature could not stop at the moment in which it provided a general, abstract theory, but having reached this climax it swung forwards. The economic social formation as theoretical generalization was only necessary for making the concrete social realities more comprehensible.

Having compared the empirical experiences of natural sciences and Newton's scientific world-view, *Einstein's theory* also takes us back to the concrete natural objects when it states that absolute space-time is impossible and as such cannot be explained beyond a certain interval, because its ground, the distinguished view of reality, attached to an observer is arbitrary — even if it is justified in certain earthly conditions. The definite formulation of the relativity of space-time is nothing else but the attachment or rather reattachment of the space- and time parameters to that they have been detached from, to the concretely and separately moving systems. This is in fact a return at a higher level to the local — but in its particularity inseparably unified — concept of space-time of the local societies preceding feudalism. The change: the local societies separated as small local units are individual mesosystems in the same way as the cosmic macrosystems are, to which the category of absolute space-time cannot be applied. Taken in themselves, the space-time of neither the local societies nor the cosmic systems can be broken up into space and time, the motion in local, relative space-time, concerning its change, is a homogenic structure. All these features will not make the above systems, i. e. the Newtonian one and the relative local systems 'rehabilitated' by Einstein inconvertible, they simply do not allow the qualitative differences to be disregarded.

In the second half of the 20th century there has been an overwhelming demand for mapping the uniform features of motion in the material world and for finding the common, general features in the forms of motion of qualitatively different kinds of substance. This process is hindered among others by the fact that while the essence of the space-time of substance is defined in terms of matter in motion, thus the motion of space-time is identified with the *concepts of natural sciences* concerning space-time. With this, without any grounds the philosophical notion of space-time is regarded as being identical with the physical space-time of substance. This is supported by the fact that physical characteristics are attached to both space and time, three-dimensionality to space and irreversibility to time. According to certain researchers, while surveying the kinds of substance and

forms of motion in the material world it is exactly the unsolved problem of social existence and social motion that reveals that the characteristics of space and time are probably much more complex and diverse than they seem to be. Therefore the recognition of the objectivity of space and time does not mean or does not require the general recognition of any of their physical characteristics.

It is especially a scientific research that raises the problem: if physical space-time can be attributed to the physical world alone, there should be a concept of space-time that can be attributed to the social world as well, one in which 'social substance' moves around. In our view this latter, i. e. 'social substance' moves around. In our view this latter, i. e. social space-time can fundamentally modify the arguments against the permanence of the three-dimensional space and the irreversible time as permanently belonging together. Let us quote an expert, who in our view expresses the same opinion: 'Concerning metagalaxy, there is no uniform time, since the Universe is not homogenic and not isotopic, therefore a concept defining the state of the whole metagalaxy at a given point of time loses its absolute meaning' (BUTAKOV, 1980). This argument implicitly gives way to the interpretation of the motion of social existence as change in the state of social space-time. Since, even if we think in terrestrial terms, it is true that the present state of existence of Mankind is not homogenic or isotropic either concerning the modes of production or the economic social formations. Primarily, since today several modes of production exist simultaneously and the local forms of the modes of productions of the same type are also different. Not to speak of the fact that the *three-dimensional* space cannot possibly be interpreted in social terms and the *irreversibility of time also loses* its absoluteness ... *the society.*

The different modes of production and economic social formation existing simultaneously at a given time make the statement about the irreversibility of social time impossible concerning the whole of Mankind, which also applies to the case of physical time at a given state of time of the Universe. And if we examine the irreversibility of time as a dialectic negation and stick to the interpretation of social space/time as an economic social formation, since the carrier of the motion of the economic social formations is the system of relations of production, the forms of collective property — which disappeared with the disappearance of primitive communities, but returned in socialistic forms — argue for the 'reversibility' of time. The situation is different of course when social motion and change in the society are interpreted as the sequence of historic changes of the state of a given

local economic social formation, i. e. as development. With this, however, we point to the complexity of the interpretation of social space-time and not to the impossibility of such an interpretation.

2. Philosophical Approach to Space-time

Despite the fact that the use of strictly scientific terms in the analysis of the society is regarded by many as mere fashion, we are convinced that this is not the case in the interpretation of space-time in the social theory, since there exists a demand for defining a general space/time category of the philosophical theory on the same level of abstraction as the concept of substance. This latter is justified by the practice of systems-approach to society. If a society is seen as a system of subsystems, e. g. micro-groups, and this society is examined as their structural interrelations, it is easy to forget about the fact that these social formations themselves are the manifestations of some social movements, therefore it may happen that the carriers of the inside, dominant motions of societies are assigned at will form among these formations. It made the pitfalls of this approach avoidable because it is unambiguous: the economic social formation is the system itself which is the social space-time at the same time, the essence of which is social motion. The basis of the inside motion of society is the successive change of state of the relations of production, which change has clear, irremovable and characteristically inherent parameters of social space-time. Therefore the examination of the inside motion of the human society cannot be broken into the examination of the manifestations of different social formations but it can be attributed to the changes of the state of the metamorphosis of the economic social formation arising from the relations of production, the social space-time created among people in the production process. Individual generations enter then this social space, and having left their 'marks' on it, hand it over to their successors while leaving.

We mention only one of the possible positive bearings of the possible interaction of the physical and social concepts of space-time. Physical space-time supports the concept of social space-time with the fact that the space-time of this latter system is not just any structure but the coherent manifestation of the inner motion of the system, which cannot be changed by an external agent (i. e. external to the system), e. g. by the entering individual. At the same time social space-time can make it clear that it is

inadmissible to break up the space-time parameters of any local system of the material world into space and time or to disregard either of them for the sake of examination if we want to get true information concerning its motion.

Let us point out some other problems which — in our view — should be touched on in the further elaboration of the space-time concept promising integral philosophical generalization. If the three-dimensional character is attributed to the concept of physical space, the three dimensions can either be applied to social space as well or the criterion of three-dimensionality should be separated from the most general concept of space. In our view this latter should be done. For the physical postulation of three dimensions — social width, length and height — is absolutely inapplicable, it is nearly as big a nonsense as the absolute direction-setting in the Universe as it is immovably tied to a concrete, determinate observer and it becomes relative even for another observer. But on second thought we have to admit that in the case of the society the threefold structure is related exactly to social time. In the transformation of the society past, present and future denote an objective triplicity, three dimensions, which makes the real moments of existence separable for those socially existing at a given moment. Thus social time is exactly the succession of past-present-future in the social space-time of the economic social formation, which means the existence of 'already and still' for the given social formation. Therefore in our view besides the three-dimensional physical space the three-dimensionality of social time can be found. What can be said about the feature of irreversibility attributed to physical time? Here the problem also has to be raised: we either have to prove of social time that it is irreversible or we have to disregard the irreversibility feature attributed to the concept of time as a *merely* physical characteristic. We find that this latter would be appropriate since it seems to us that the three-dimensional character relates to social time while it is reversibility that relates to social space. Namely, in such a way that social *space should seem to be reversible.* With this the question is not only whether most generally space is three-dimensional or whether most generally time is irreversible but it is also doubtful that the dimensional character pertains to the general concept of space and that the general concept of time can have reversibility as a characteristic feature. Returning to the problem of the reversibility of social space let us see how 'reversibility' or 'irreversibility' can be understood at all.

Francois Jacob e. g. states that in contrast to most branches of physics ... in the world of living beings we can find the arrow of time ... Since in physics there is no need for the arrow of time as e. g. the birth and death of particles can be regarded as processes of their strict reverse ... Then he goes on to say: The film run backwards made it possible to sense visually what a world with reversible time would be like, a world where in our cup of milk could be separated from coffee and would flow back into the jug, where beams of light would come out of walls and would unite in a hole instead of spreading from a source of light .... In such a world with reversible time the processes in our mind and memory-formation would also get reversed, and so would past and future as well ... (JACOB, 1982). Can milk be separated from coffee once it has mixed with it in the cup? Why not, if we have the appropriate technical equipment for it and we devote at least as much energy to fulfil this task that we used when we poured and mixed, etc. the different components. And can we not gather the spread beams of light as 'energy beams' into a hole with the help of appropriate equipment? Why could we not? And if we can, would past become present or future or would future become past? And what is the situation when we perceive beams of light arriving from a distant star in several light-years? When we perceive the light we see the past in the present. But did anything reverse in reality due to this? I believe that based on the above mentioned we have to state that in the interrelation of systems with relative space-time, present, past and future will be equally relative and we can only speak of system-past, system-future — i. e. of a relation to the distinguished observer (which is relative in relation to his space-time). With the problem of system-past, -present and -future we naturally cannot remain in the field of natural sciences. We have to note that people living in each given economic social formation will consider their own system space-time organic — and as such a ground for comparison whatever opinion posterity will hold of them and their social aim.

3. Reversibility of Space-time

Returning to the problem of reversibility: if space and time are inseparable both in natural and social livers, this fact itself will render insupportable the examination of e. g. time separately from the point of view of reversibility. For the same reason the examination of space separately from time — while evaluating its dimensions — cannot be justified either. Therefore *the*

problem of reversibility should be raised in relation to space-time (and not only to time). So we have to ask either *space/time can be reversed* or is it irreversible? Obviously, here we do not speak of time turning into time, past turning into future and future turning into past. Therefore the issue of the reversibility of space-time raises the question of the relativity of space and time in their relation to each other and can be concretized as such: *can time be turned into space* or *can space be turned into time?* When, for instance, the beams of light from the above-mentioned star reach us and we see them, albeit the given celestial body does not exist any more — would it not happen that space has become time in a given space-time system in relation to another space-time system?

We, the observers say that the celestial body which does not exist any more is in the space that we can perceive and see, we say that we share a space with it — it is near us, it moves near us —, although the beams of light that are reflected from it and reach us are real. And when we take the film on which we have recorded the processes of making coffee with milk and of light spreading, we will find time being in the same space, that is the film itself is the time that has become space. And similarly, all successions made simultaneous in relation to the given system are the reverses of space-time, time turning into space and space turning into time. The same can be said of the situation where on the one hand working-time is made up of the objectivisation of human forces and during which, on the other hand, in the working process (that is in a given period of time working-time changes into space inasmuch as being objectivized it takes the form of commodity; or in the process of production the time of the producing of man's life is objectivized as e.g. means of production, service, information, etc. — it becomes space. In the most basic activity of a society, i. e. *in production, this is how time turns into space and vice versa* depending on which is the system examined whose space-time is concerned and where the observer stands with his own system space-time. Looking at the successive progressive periods of economic social formations we can come to a similar result if we examine the whole of Mankind: the successive modes of production developed in Europe can be found simultaneously. This co-existing simultaneity is possible because each nation, each people has its own motion and its own rhythm of motion (etc.) related to its own system space-time, but this motion is perceived as space in the simultaneity of different peoples, although in reality the point is that there is a difference in the system-time of the given people, in the successive phases of motion in time. In the present, however, we can only perceive this succession

as a simultaneity. But in this case both our perception (that we see as simultaneous) and the perception of the given people how they see their own motion successive, is objective perception. Since — if they see the same moment, e. g. the present not from the state of motion of the whole Mankind but from that of individual peoples, nations, e. g. Manhattan seen with the eye of an Indian fellah or the Indian fellah seen with the eyes of a worker of Manhattan, this objectively simultaneous existence — spatiality — will obviously be perceived as succession — temporality. The examples are countless. Examine only the case that for a child who lived together with his parents for years, the co-existential spatial motion after their death becomes successive existence (temporal motion); the accumulated treasure (time-like motion) can be used up all at once (space-like motion); if a revolution reaches only the phase of political revolution, the old ruling class will be able to call power back, the constant cell division (time-like motion) ensuring the survival of the living organism becomes single in a cancerous disease (simultaneity) and if we managed to change the time that has turned into space into time again, to force it into simultaneity, that would be recovery itself.

Is it not the case that the philosophical concepts of time and space have not overcome the mechanical and metaphysical conceptions? It is known that in the field of the inanimate world, i. e. in the field of natural philosophy Hegel also kept to the idea of the unity of space and time and referring to the categories of existence he spoke of existence outside time and space. But it was exactly Hegel who postulated not only their unity but that they mutually turn into each other. The possibility of this turn is found in the concept of *place* but his brilliant intuition concerning the unity of time and space is only a theory relating to the physical world, to the transition of mass into speed (HEGEL, 1969). It is not accidental that Feuerbach says about his interpretation of history: the form of both his view and method is the exclusive *time* without the patient space: his system knows of *subordination* and succession but nothing of co-ordination or co-existence. (FEUERBACH, 1970). Then he goes on to say: 'The phases of the development of nature by no means have only historical significance, nevertheless they are momentums, but the moments are of the simultaneous totality of nature and not of a special individual totality' (ibidem). Feuerbach's critical notes also warn us that the physical conception of space and time cannot be applied to society unchanged.

In Hungarian expert literature it was Attila Ágh who raised the question of human space-time in connection with the problem of future-research.

Looking back on the Hegelian and Kantian conceptions and the concepts of social movement of Lukács and N. Hartman he shows that in the interpretation of social movement there has been significant development. Ágh writes as follows: 'space and time both possess the same natural objectivity as ... natural objects and phenomena ... Man objectivizes and humanizes the natural world surrounding him as his inorganic body, through his objectivizing activity he lends them human contents and qualities ... But this applies to the dimension of space and time as to the space-time dimension of socially, historically moving substance of Man's inorganic body.' Then he goes on to say: 'The space- and time-dimensions of the human society are interwoven — they constitute the *integral* space-time structure of society. The formation of space and transforming it into human can be the aim of social practice, the aim of Man. The formation of time is the production of the future' (ÁGH, 1974). In our view, however, much of this space-time conception goes beyond the concept of the natural sciences, space-time is still regarded as a 'framework', but this time is a social one. On the other hand 'space' with the social existence is social space as well and in the production of the future it is the social space and not the time that it produces. Only for Man, for the succession of human generations does the socially produced space manifest itself as time and vice versa, etc.

In the most general philosophical problem of space-time — in our view — it is not enough to 'introduce' historical dimensions. Instead, we have to ask in a different way in order to get different answers. For instance: instead of the reversibility of space and time the universal qualities of motion should be examined. More precisely, it has to be examined whether directionality as a universal quality can be applied to motion or not — at least according to L. Seve the correct question should be put in this form (SEVE, 1980). I also think that this is the most promising formulation of the question, which can help us to grasp the most general philosophical concept of motion. Since in this formulation it is clear that space and time do not exist in themselves but we perceive the motion of substance as space and time. Thus we have to find an answer to the problem of reversibility while examining the motion of substance. And only if we take directionality as a universal quality of the motion of substance can we speak — in my opinion — of space-directed and time-directed motion (-direction).

It is essential that we consider the following as well: can we speak of the directionality of motion in the case if we do not postulate any distinguished observer — outside in relation to the local system? Probably not.

Returning to all that — in our view — was formulated in a new way and as something new in connection with the philosophical concepts of space-time and motion: besides naturally the use of the concept of social space-time is justified not only in dialectics but in the social theory as well as it makes the most general generalization of reality possible. Hereby the *general conception of relative system-space-time* becomes possible and so does the *interpretation of such a unity* of space and time, of their real inseparability *concerning the concrete system which unity means the constant transformation of space into time and time into space.* With this — in our view — it is not the directionality of substance motion that gets into the focus but the issue of the reversibility of motion — that is the convertibility of space into time and time into space. This latter of course does not cover directionality. And this latter, as we have proved by examples, is possible and is so common that is applies to the conversion of natural and social space-times into each other as well.

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