

"SpaceTime as the Basis of Knowledge"

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Keynote address at Convergencia/World Congress of Convergence, Cartagena, Colombia, May 31-June 5, 1997

Time and space are the most obvious parameters of our existence. They are among the first concepts a child learns. However uneducated people are, they will be able to identify the times and spaces in which they live and usually those in which others live. One would think these concepts would be at the center of any and all attempts at social knowledge. And in a sense they are. We discuss the sequence of events, and we say that processes have histories. We also regularly notice and seek to explain the fact that social conditions and social relations seem different in different places. So we appear to be taking into account not only time but space as well.

But in fact, in a more important sense, we ignore time and space completely, because we seldom, if ever, take into account the social construction of time and space, and almost never the social construction of their combination which I shall call TimeSpace. In a sense this is not surprising at all. Historical systems derive such stability as they have from the fact that most people located within them consider the social system natural and enduring, if not eternal. To do this, it is easiest to consider time and space as invariants, as Kant theorized.

"The moving finger writes," said the poet Omar Khayyam. "And having writ, moves on." Time rolls forward imperturbably in a universe which surrounds us. No one is capable of changing time or space. Of course, for all practical purposes, this is true. But it is equally true that the meaning of time and space, the interpretations we make of time and space, the use we make of time and space concepts, the notice we take of time and space are not at all invariant. Just the opposite! And this has been nowhere as true as in the modern world-system in which we live, one of whose salient features is the room that it has given for multiple social constructions of TimeSpace, a feature that has given it great pliability and resilience, but at the same time an extraordinary ability to hide from its participants the reality of what they are experiencing.

Modern structures of knowledge have insisted that time and space are invariant exogenous factors of social reality within which everything we do and say somehow fits. We are subjects acting within objective reality. We are humans, and time and space are external to us, part of our natural environment. We exist immanently, but time and space persist despite us. Given this belief in a radical disjuncture of humans and nature, which reflects the same binary, antinomic conceptualization of reality as the purported disjunctures between the particular and the universal, the idiographic and the nomothetic, philosophy and science - all part of the intellectual scaffolding of the modern world-system, we are logically forced into perceiving only two kinds of TimeSpace. On the one hand, there is that of the infinitesimally small events, which I call "episodic geopolitical TimeSpace," and on the other hand, there is that of the infinitely large continuing realities, which I call "eternal TimeSpace." {1}

{1. I have defined what I conceive to be the five possible TimeSpaces in "The Inventions of TimeSpace Realities: Towards an Understanding of our Historical Systems," in *Unthinking Social Science* (Cambridge: Polity Press, 1991), 135-148.]

The world of knowledge, for 200 years now, has required the analyst to choose among only these two possible TimeSpaces to describe social reality.

Episodic geopolitical TimeSpace is the explanation of the immediate in time and space by the immediately prior in time and space, each vector being summarized as narrowly as possible. It is the analysis of events, which of course occur in an instant at a particular point - hence episodic in a series of episodes, an event in an endless series of events; and geopolitical in terms of the nominal definition of the space in which it occurs. Every episodic moment is equivalent to every other; hence no patterns

which are trans-event can be discerned, because they cannot exist. The space is superparticular, and in its exceptionality equivalent to every other; hence no patterns which are trans-locality can be discerned because again they cannot exist. Eternal TimeSpace pretends to be the polar opposite. In eternal TimeSpace there exists nothing but generalizations, since the laws of human behavior hold, as it is said, across time and space, that is, without reference to the variations in time and in space. But since every time and space is in reality different, or it would not be specific, to assert eternal TimeSpace is entirely compatible with the assertion of episodic geopolitical TimeSpace. One asserts eternal TimeSpace by ignoring the differences between particular TimeSpaces despite the fact that one knows that they are there. The two TimeSpaces constitute the remote other ends of a logical continuum.

The problem is that the actors in this social reality (as opposed to their analysts) have not at all limited themselves to these two, narrowly-defined and overspecified TimeSpaces. They have not done so, because accepting this antinomy places an enormous constraint upon social action and thereby upon its correct analysis. But how is it possible that the analysts of social reality, those who are presumed to be the specialists, in fact use a framework of analysis that is less perceptive than the rest of the world, the so-called actors in the real world? It can only be so if the specialists have created for themselves a trained incapacity to perceive, and if so, then this training itself must itself be in turn explained.

To seek some insight into this complex situation, where the keys to rational explanation are themselves the major obstacles to rational explanation, we must trace the evolution of our modern structures of knowledge, and the role that they have played in the modern world-system. The story starts, as we know, in the European Middle Ages, when the Church was still able to assert its decisive control over the definition of truth. Truth existed, as God revealed it, and as the Church interpreted this revelation.

The process of creating the modern world-system, a capitalist world-economy, involved - necessarily **involved** - an effort to break out of the constraints imposed by this clerical monopoly. Enter the philosophers, or rather re-enter! The two great movements of ideas we associate with this period in which our world-system was born are the Renaissance and the Reformation. Both involved the assertion that truth can be ascertained directly by human beings, in one case by insight into the natural laws of the universe, in the other by insight into the mysterious ways of God. But in both cases, truth was ascertained on the de facto authority of the one who had the insight, and in theory everyone might have such insight, or at least it was not an op-tion that was linked to holding some office.

The capitalist world-economy centered its activity around creation - creation of capital, creation of goods and technology in order to create capital, creation of both states and an interstate system as the necessary institutional framework for the accumulation of capital, creation of social categories in order to create the appropriate work force with both the capacity and willingness to assume roles in the creation of goods and technology, and the creation of structures of knowledge that would sustain all the other activities. There was no order of priority among these creative activities. They were all essential elements in the erection, maintenance, and flourishing of a historical system based on the endless accumulation of capital.

The revolt of the philosophers against the theologians was therefore only the beginning phase of the intellectual restructuring that was in process. In time, a specialized group of more practical thinkers began to designate themselves as scientists, a term that came to denote an emphasis on an inductive road to truth, via empirical research and experimentation, a method that could furnish evidence that might validate hypotheses or generalizations. As the members of this group achieved more collective self-confidence in the seventeenth and eighteenth centuries in Europe, they began to speak out not only against the heavy hand of the theologians but against what they saw as the equally heavy hand of the philosophers. They charged the philosophers with being disguised theologians, and asserted that the former had no greater claim to access to truth than the latter.

Thus was consummated in the late eighteenth century in what has been termed the divorce between philosophy and science, a divorce that was institutionalized in the reviving university system by the establishment of separate faculties for the humanities (or letters or philosophy) and for the (natural) sciences, a segregation that remains to this day the form of most university structures throughout the world. This was the split between what we call today the two cultures, and the divorce was not at all amicable. The scientists were disdainful of the philosophers, arguing that their ratiocinations were intellectually irrelevant and that they could be, indeed should be, ignored. The scientists thereupon distanced themselves from "culture," which was defined as somehow subjective and therefore dubious, and insisted that the scientists were objective, and therefore neutral, investigators of external reality. The philosophers, in response, asserted that the scientists were ignorant of the fundamental values upon which social life (and indeed the very work of the scientists themselves) was based, that they neglected

human (and therefore humane) concerns, and that they were incapable of promoting the good or appreciating the beautiful.

It must be said that, in this passionate war of words, neither side gave much ground to the other. Both were equally sure that they were right. The non-scholarly world however tended to find the arguments of the scientists more persuasive than those of the philosophers, since science was seen as more practical, that is, as having more useful applications in the material world. Thus, science rose steadily in public esteem throughout the last two centuries and philosophy moved into a defensive backwater. The world of knowledge was thereupon not merely deeply divided but arrayed by the larger society in a hierarchical order. In the nineteenth century, and the twentieth, those who sought to prevail in public argument and acquire public prestige usually felt it necessary to clothe themselves in the mantle of science. Ever since then, the world of knowledge has been engaged in one long epistemological debate between those who had a basically positivist view of knowledge and those who had a largely hermeneutic view, between those who said that reality was knowable by objective measurement and those who said it was knowable only by empathetic insight.

In the nineteenth century, as a result of the fundamental social change brought about in the wake of the French Revolution and the new widespread feeling that social change was both normal and inevitable, it suddenly seemed of urgent importance to understand the rules by which the social world operated, in order to be better able to control where it was going, and at what pace. This ideological need led to the creation of what we today call social science. Social science did not seem to fall obviously either into the domain of natural science or into that of the humanities. As a mode of knowledge, it came to be located, somewhat uneasily, in-between the two. In fact, in many universities, a third, quite separate faculty was established to house its practitioners. However, there was no third separate epistemology for this third faculty. Rather, practitioners adopted one of the two competing epistemologies, and as a consequence, the social sciences were torn apart by this struggle between the two cultures for the soul of the social sciences.^{2}

[2. For a brief history of these developments, see I. Wallerstein et al., *Open the Social Sciences* (Stanford: Stanford University Press, 1996). (In Spanish: *Abrir las Ciencias Sociales* [México: Siglo XXI de México, 1996]; in Portuguese: *Para Abrir as Ciências Sociais* [Sao Paulo: Cortez Ed., 1996]).

The battle raged as intensely within the social sciences as between the humanities and the natural sciences. Indeed, it was if anything more intense, since the two sides were in closer ongoing social and intellectual contact within the social sciences than were the original antagonists, the philosophers and the physical scientists. The results for the social sciences were in the long run largely negative. The two tendencies within the social sciences, what Windelbrand called the nomothetic and idiographic positions, each sought to demonstrate that it could fulfill, and fulfill better, the now culturally dominant scientific ethos: objectivity and value-neutrality. They chose however widely divergent paths to achieve this objective.

The so-called nomothetic, or universalizing, disciplines (primarily economics, political science, and sociology) insisted that objectivity was best guaranteed by the use of replicable, quantitative data. They also insisted that the closer the social scientist was (in time and space) to the source of the data, the more the data could be controlled for accuracy, and hence the less likely it would be for the researcher to intrude subjective interpretations into the recording and analysis of this data. And lastly, they insisted that research that was concentrated on a few variables was likely to contain fewer unanalyzed intervening phenomena (or middle terms) that were difficult to control and to measure. If one followed the logic of these methodological preferences, the best data was absolutely contemporaneous data, as "hard" as possible, collected in social situations where there existed excellent infrastructure for quantitative recording (which meant only in certain countries, those that were wealthier and more bureaucratized), such data permitting the researcher to measure accurately the correlation between two variables over a relatively brief period of time.

From the point of view of TimeSpace, such data was inevitably data couched in episodic geopolitical TimeSpace, with however a very strange twist. Because the nomothetic social scientists insisted that truth was universal, that is, that truth statements were valid across all of time and space, they inferred that their findings, which were actually based only on episodic geopolitical TimeSpace, were to be considered findings about eternal TimeSpace. The inference was a logical leap of considerable fragility, but it is nonetheless the one on which a very large part of modern social science is based.

The so-called idiographic, or particularizing, social scientists (primarily historians, anthropologists, and Orientalists) turned this process upside down. They preached not closeness to data but remoteness from data. They asserted a socio-psychological premise: the closer the scholar is to his/her data, the more

likely he/she is to be motivated to distort the recording of the data, in order to serve immediate political and social ends. Value-neutrality is easiest, they said, if one studies what is far-off, in time and space. On the other hand, idiographic social scientists were simultaneously arguing that interpretation was the heart of the scholarly exercise and that intelligent interpretation required a deep knowledge of the total context (the history, the culture, the language). Of course, one knows the context best of one's own times and one's own culture/nation/group. And this seemed to push the researcher in the opposite direction, that of closeness. How then could the two demands be reconciled? The researchers solved the dilemma by combining two injunctions. They would study only the past - the chronological past in the case of the historians; the hypothetical, unchanging pre-present in the case of the anthropologists and the Orientalists. In this sense, they were standing remote from their data. But they would study it only after deep immersion in the context: by long acquaintance with both the archives and secondary sources, as well as linguistic knowledge in the case of the historians, by erudite scholarship and careful philological reading of the texts for the Orientalists, by participant observation for the anthropologists. Again there was a twist: close acquaintance with the context, but not with the people - who were dead for the historian; unvisited for the Orientalist; and left behind by the anthropologist (who was enjoined under no circumstances to "go native"). Thus, they stood intellectually close to, but presumably emotionally aloof from, their objects of enquiry. Finally, the emphasis on the context implied a lifelong commitment to a narrowly-defined segment of social reality, since it would be extremely difficult to devote the necessary time to the detailed study of more than one such segment, and without such investment of time the scholarship would inevitably be superficial (that is, would result in an inadequate interpretation).

In terms of TimeSpace what happened was that, in a manner parallel to the nomothetic social scientist, the idiographic social scientist was pushed in the direction of narrowing ever more the scope of his enquiry, towards in fact the use of episodic geopolitical TimeSpace, while at the same time arguing that in this microcosm, he was discovering something universal in human nature, a hint of eternal TimeSpace.

This historical evolution of social science - the lack of an autonomous epistemology, its consequent subjugation by the centrifugal pulls of the two cultures, its retreat to ever more narrowly-defined objects of investigation - reached its culmination in the period following the end of the Second World War, the period between 1945 and 1970. Social science was at that time and for the first time accorded considerable public recognition, not perhaps anything like that accorded the natural sciences, but nonetheless a great deal more than previously. The increased social recognition was rewarded with increased social and financial support, once again at a level far beneath the natural sciences, but at a far higher level than previously. And yet, and yet, social science was using this prestige and the financing to pursue primarily the microcosmic, deeply committed as it was to only two kinds of TimeSpace, each of which found the microcosmic methodologically more satisfactory.

It was precisely this entrenchment of the microcosmic, and the consequent inability to interpret the real world that was so obviously and rapidly changing at a macrocosmic level, that provoked a reaction and led to the long simmering critical self-assessment through which social science has been going for the last twenty years and which shall no doubt be continuing for another twenty. It is reflected on the one hand in widely-expressed complaints that the social sciences are falling apart (what the French call *émiettement*) and on the other hand in the widespread, almost desperate, search for new paradigms which it is hoped will somehow rescue social science. But rescue it from whom or from what? Perhaps from itself.

What had social science gained by concentrating on only two TimeSpaces - the immediate and ephemeral one of episodic geopolitical TimeSpace and the unchanging one of eternal TimeSpace? For the primary consequence of this concentration on the microcosmic was political irrelevance, a sort of self-emasculatation that was at once the price and the guarantee of public recognition and support. And what had those who supported this kind of social science gained by this emasculatation? It seems quite obvious: both the avoidance of embarrassing insightful analyses into the dark corners of reality and the ideological masking of existing patterns of hierarchical privilege. The language of value-neutrality was itself the major culprit of the intrusion of value-distortion.

What kinds of TimeSpace were not noticed in this epistemological cul-de-sac of the social sciences? There were three, and each was evacuated from discussion in different ways. I have given names to each, and I shall discuss successively what they imply and why they were evacuated. I call them cycloideological TimeSpace, structural TimeSpace, and transformational TimeSpace.

Cyclo-ideological TimeSpace should not be confused with cyclical theories of history, which are nothing but variations of eternal TimeSpace. The great cyclical theories all describe presumed eternal

patterns, which however take the form of a wave instead of a straight line. But in these theories nothing ever really changes, because the laws of human behavior are eternal. I am not talking of such eternal cycles. Rather I am talking of the cycles that occur within the functioning of particular historical systems and which are in effect the regulatory mechanisms of these systems. All systems have regulatory mechanisms, or they would not be systems. Mammals breathe, for example. This has the function of both taking some external elements into the body and discharging other elements out of the body. This maintains a physiological balance of sorts, without which the body cannot function. When a mammal ceases to breathe, it ceases to live. We can measure these cycles. When the physician tests a human being's blood pressure, he records it in terms of systolic and diastolic lengths, because the heart contracts and relaxes, contracts and relaxes. When we have understood this cyclical pattern, we have understood something very important about the physiology of the body.

Analogous rhythms occur in historical social systems. If we wish to analyze the modern world-system, for example, it is crucial to discern the regulatory structures, which take the form of such cyclical patterns. A study of these patterns reveals what is happening within the system, why, and when. Has it ever occurred to you how strange it is that most economists are perfectly willing to accept the reality of very short-term wave-like movements, generally called business cycles, that last 2-3 years at most, and which are usually over almost as soon as they have begun, but these same economists are extraordinarily reticent to accept the reality of longer cycles, those called Kondratieff cycles, which tend to have a 50-60 year life?

Why this curious inconsistency? Perhaps the answer lies in the inferences one can draw from the study of cycles of different lengths. If one notices very rapid, short-run cycles, we may infer that individual behavior is subject to the vagaries of forces that are beyond its control (and hence for which no one need be held responsible) but which also do not endanger its survival, since they reverse themselves very fast. If however we talk of 50-60 year cycles, of which the B-phase (or the negative phase) is 25-30 years, we can no longer be quite so indifferent. If a Kondratieff B-phase is seen to be associated with increased worldwide reduction of wage employment, this is a serious matter with serious political implications. We will want to know at least what is responsible, if not who is responsible, for this negative period.

The analysis of medium-term cyclical patterns in the functioning of an historical social system lays bare the anatomy of the system, allows us to inspect its workings, and makes possible not only a scientific account of its mechanisms but ultimately a moral appreciation of its rationality as a system. The analysis of medium-term cyclical patterns puts us on the road to meaningful judgments about what can be done, but also about what cannot be done, to alter the operations of an ongoing system. It is extremely empowering. Why has social science historically tended to neglect this kind of study? Why has it often heaped obloquy on those who have attempted it, scorning such analyses on the grounds either that patterns do not exist (since only episodic geopolitical TimeSpace exists) or that the data do not permit asserting them as eternal patterns. The latter is of course true, since cyclical patterns within the framework of a specific historical social system are indeed not eternal, and do not pretend to be. They pretend to explain the functioning of a particular system, but one that extends over large space and long time, the *longue durée* of Braudel.

I have called this kind of SpaceTime cyclico-ideological, because the spatial parameters of such conceptions tend to have ideological markers, reflecting defined divisions within the geocultural norms of the historical system in question. We talk for example of mercantile, industrial, and post-industrial eras of modern capitalist history. We spoke until very recently of there being two blocs, two worlds, a free world and a Communist world, but this ideological space was in fact linked to a very specific time period, 1945-1990. It exists no more, and it could not be considered to have existed in the period before 1945. What do such characterizations do when they single out and give names to particular cycles in a series of repetitive cycles? They tend to reify certain differences and simultaneously efface a considerable number of similarities. They tend to take phenomena that are cyclical, that is repetitive, and suggest that the cycles are less important than the qualitative shifts, which it is suggested are more fundamental than they are in reality. They divert attention, that is, from the structural, the realm of the fundamental qualitative characteristics. Thus, while perceiving cyclico-ideological TimeSpace does enable us to understand far better the functioning of a system, it has nonetheless its dangers. Through its ideological parameters, it can lead us into perceiving constant medium-term novelty, which can encourage us to slide back into the short-term, into episodic, geopolitical TimeSpace, and not so paradoxically at the same time into the arena of the total absence of novelty, eternal TimeSpace. Cyclico-ideological TimeSpace thus often undermines itself. Its function is for us to perceive the repetitive patterns of a system to be sure, but this is only useful if we remember that such repetitive patterns occur within the framework of a historical system limited in both time and space, albeit long time and large space.

If we are to keep in mind the outer limits in time and space of any historical system, we need then to have a clear idea of structural TimeSpace. Historical systems, like all systems, are organic in the sense that they have a genesis, a historical life, and finally an end (a collapse, a transformation) - all of this locatable in both time and space. Structural TimeSpace is in fact the key concept in social science. When we locate it, we have the meaningful unit of analysis of social continuity and of social change. We have the basic parameters within which social interaction and social conflict occur. We know whereof we are speaking. Yet social science in the modern world has treated structural TimeSpace as though it were a high-voltage transmitter. We approach it with fascination, and we retreat when we get too close, afraid of being burned.

There is a sense in which social science in the modern world has been nothing but one long exercise in establishing what it is that is modern about the modern world, a sort of quest in self-discovery. Are we afraid of what we shall discover? Take the long hesitation of calling this capitalist world capitalist. Why are we searching for euphemisms? What is the fear of the term, when, as Braudel remarked, though we chase it out the front door, it always returns through the window? The answer is no doubt simple. There is nothing that so clearly shows up the limitations of both eternal TimeSpace and episodic geopolitical TimeSpace as the concept of structural TimeSpace. Nothing gets us as close to the story of human choice and human evolution as understanding what kinds of historical systems we have constructed, what their parameters and boundaries are, and why their existence is necessarily limited. Structural TimeSpace speaks to what we cannot change (the system in the short run) and what will surely change (the system in the long run), and why the system doesn't really change in the short run (the cyclical rhythms) and why it in fact does change in the long run (the secular trends, leading far from equilibrium).

Insofar as social science has failed to perceive structural TimeSpace, it has not merely failed in its mission but has manifestly misled us in our quest for self-knowledge. Social science has thereby disabled us in our ability to construct the world we wish to construct, the good society we prefer and covet, merely by denying the very possibility of doing this. This brings us to the last kind of TimeSpace we have neglected, what I call transformational TimeSpace. This is the brief, very rare, moment of fundamental change. It is the moment of transition from one kind of historical system to another, from one mode of organizing social life to another. These moments do not come often. They come only when an historical system has exhausted its mechanisms of reequilibrating itself, has used up the efficacy of the cyclical rhythms, has gone sufficiently far from equilibrium that the oscillations have become relatively wild and unpredictable. We enter then into the moment of which Prigogine speaks, the moment of bifurcation in which a new, but nonpredictable, order will emerge from the chaos into which the structure has acceded. Even then, we do not know if we are undergoing truly fundamental change. For it is always possible to recreate an analogous historical system, or one that is indeed morally worse. But it is also possible in these moments to create something better, more hopeful, more imaginative, more creative.

This moment of transformational change, or rather of the possibility of transformational change, has two vectors that are decisive. One is the political struggle between those who hold different, opposing value-systems. But the second is the struggle within the world of knowledge, which determines whether we can clarify the historical alternatives that we face, make more lucid our choices, both criticize and empower those who are engaged in the political struggle (from which of course the world of knowledge is unable to dissociate itself).

I have tried to present the case that the concept of Time-Space, of the multiple social constructs of TimeSpace, is at the center of the intellectual task of the ongoing reconstruction of the world of knowledge which is necessary to enable the world of knowledge to fulfil adequately its role in this time of transformation. The extension and sequence of time and space may be beyond human control. But time and space affect social reality primarily in the ways in which they are assimilated within us as categories that provide the premises of our thought. Inside and outside, before and after, the same and the different are all defined in terms of boundary lines that we construct, and whose only possible justification is their social usefulness. But even then, the very term "social usefulness" presumes time and space boundaries which are themselves socially constructed, and socially disputed.

The emergence of complexity studies within the natural sciences is very illuminating in this regard, and offers great support and assistance for the reconstruction of social science. Just as the social construction of time and space was always true but was only recently (re)discovered as a key issue, so the concept of complexity within the natural sciences was always true but only recently (re)discovered as a key issue. Classical mechanics, which had been at the heart of the scientific enterprise since at least the seventeenth century, was based on the opposite premise, that of simplicity. There were said to be eternal rules that

governed physical phenomena, rules that could be stated optimally in simple formulas. These equations were linear and deterministic. Once one knew these equations and any set of so-called initial conditions, one could predict perfectly the future and the past. Time was reversible, in the jargon of the enterprise. Whatever fluctuations occurred in the real world, largely the result of measurement errors, were swiftly tamed by a return to equilibrium. These Newtonian-Cartesian premises were the basis of the concept of eternal TimeSpace and of nomothetic social science.

Already in the last third of the nineteenth century, Henri Poincaré had demonstrated that the so-called three-body problem was insoluble, that the impact of a third body on the relations of two bodies moving under no influence other than gravitation could never be specified with total accuracy. And of course if it could not be specified for a mere three bodies, *a fortiori* it could not be specified for the virtually infinite number of bodies that exist in the real universe. But nonetheless it was not until the 1970's that concepts like asymmetry, non-linear and non-equilibrium thermodynamics, fractals, and strange attractors came to be taken seriously by a significant segment of the natural science community. The heart of the challenge to classical mechanics lies in the phrase, "the arrow of time." What is being asserted is that time is not and is never reversible, that everything that affects everything that is and will be, that the past constrains the future but never determines it. In this conception of the physical world, equilibria are temporary, and all systems tend over time to move away from equilibria. When they move far enough away, the oscillations (the cycles) become dramatic and sharp and at a certain moment there is a bifurcation (technically the situation in which there are two or more solutions to an equation). The bifurcation is inevitable and therefore predictable, but it cannot be determined in advance which path the process will take. What we can say is that the world is complex, and getting ever more complex, and that the task of science is not to reduce this complexity to an impossible simplicity but to explain/interpret this complexity.

For social science, the rise of complexity studies represents an epistemological revolution. On the one hand, it undermines totally the basis of the concept of eternal TimeSpace, while at the same time rejecting that of episodic, geopolitical TimeSpace, substituting for it the rules of social processes for as long as these rules are relevant. For the "orders" that are represented by these rules constantly yield place to periods and loci of "chaos" out of which new "orders" are constantly regenerated. This is precisely the concept of structural TimeSpace with cyclico-ideological TimeSpaces located within it, coming to moments of transformational TimeSpace. Since this model is coming to us from the natural scientists, the heartland from which social scientists had drawn their views of TimeSpace, this critique of the impossibility of eternal TimeSpace cannot be considered the mere romanticism of those who reject science for irrational and reactionary reasons.

There is however a second element that is revolutionary in the impact of complexity studies on social science. Insofar as the study of social reality was distinct in the nineteenth century and early twentieth century from the study of physical reality, those who wished to bring the two into line with each other urged the social scientists to adopt more closely the model of classical physics. Today, however, although the drive for bringing the social sciences and the physical sciences closer is still there, the terms of their relationship are quite different. Now the proponents of complexity studies are urging upon physical scientists "the arrow of time," which is fundamentally a social science concept. The physical scientists are recognizing historical social systems as simply the most complex system in a world of systems to be analyzed in their complexity. There is thus occurring a "social scientization" of physical science, but it is social science as it might be and not as it has been.

At the same time, in the same period since the 1970's, we have seen the growth in the humanities of what is called cultural studies. Cultural studies has presented itself to us as a radical critique of prevailing epistemologies in a way parallel to the critique that complexity studies has made of classical mechanics. Cultural studies has attacked "scientism," but in this regard, it has said little that has not long been argued by those of a so-called humanist bent. What is more significant in my view is its attack on the traditional humanities, on the concept of a self-evident aesthetics which can be summarized in so-called canons. Canons represent eternal TimeSpace within the humanities, whose protagonists were proclaiming it even as they were insisting that all aesthetic creation is irremediably particular, that is, located in episodic, geopolitical TimeSpace. In the humanities just as in the natural sciences, the supposedly contrasting epistemologies of eternal and episodic TimeSpace were in reality totally compatible one with the other.

What the proponents of cultural studies have been saying is that all is context, that texts are written within specific contexts and that equally they are read within specific contexts. There is hence no definitive meaning of any text, and a text is certainly not the unalterable property of an author. But what is the implication of this kind of assertion? Surely that there is a social meaning to a text, a meaning that

evolves with the changing social situation. There are only two roads to go from this observation. One can go down the path of solipsism, in which the world exists insofar as the analyst conceives of it. But solipsism is a self-defeating perspective, since it renders communication not only impossible but irrelevant, and therefore all scholarship pointless. In any case, the solipsist may be in for some rude shocks, when the supposedly non-existent outer reality suddenly impinges on his survival.

The other route from the observation of the contextuality of all texts is into the assertion of the social construction of reality, but therefore the existence of contingent, albeit not fleeting, rules that explain how we socially construct reality. The social construction of reality is a social, not an individual, process, constructed over structural TimeSpace and varying over cyclico-ideological TimeSpace, which brings us to a central premise of social science. The only enduring outcome of cultural studies lies thus in the "social scientization" of the humanities.

So there we are. In the classic divorce between philosophy and science, the social sciences were caught in a tug-of-war between the two, and torn apart in the process. But in the bifurcation in the world of knowledge through which we are living, the synchronous rise of complexity studies in the natural sciences and of cultural studies in the humanities may be creating a new convergence around social science, in which a new epistemology may arise that will overcome the two culture dichotomy and recreate a unified epistemology for the world of knowledge.

Why now, you may be thinking? Not so long ago, the concept of the two cultures seemed unassailable. In his famous essay, written in 1959, C.P. Snow was reduced to calling for greater comprehension between the practitioners of the two cultures. It apparently never occurred to him that the two cultures might become one again. Obviously, there have been developments internal to the world of knowledge which have led in this direction. There were problems in the physical sciences that seemed difficult to treat within the framework of classical mechanics, especially those dealing with the supermacroscopic and the supermicroscopic realms. But this had been true for a century already and it was only in the 1970's that these issues caused a substantial alternative culture to emerge within this community. Similarly the canons had seemed dubious to many for quite a long time. However, like beeches in the wind, previously they had bent and modified their contours as required. Suddenly, the wind had become much stronger.

It seems clear to me that the dramatic shifts in the world of knowledge reflect dramatic shifts in the real world, in the workings of our modern world-system. Our modern world-system has been a remarkably stable system for one that is so dynamic and so seemingly ever-changing. The secret has been its ability to permit simultaneously the endless accumulation of capital (and a considerable accumulation at that), the ever-widening polarization of the world-system, and the willingness of the vast majority of the world's populations to tolerate the anomaly. There was a point in time, in the early nineteenth century, when it did not seem very possible to reconcile the accumulation and the polarization, and the specter of the "dangerous classes" (what Marx and Engels called the "specter of Communism") posed itself as an imminent threat to the stability of the system.

This specter seemed quite threatening in 1848, and then it seemed to recede, and despite much hullabaloo, was kept very much in check until 1968. How was this done? The basic mechanism was the achievement of a central place for liberal ideology in the geoculture of the world-system. Liberalism situated itself in the political center with a commitment to reformism through the use of the state machinery, but a reformism that was both gradual and "rational," that is, administered by experts. Initially put forward within Europe in the nineteenth century, liberalism combined three reforms: the suffrage, the welfare state, and political integration of the working classes via nationalism and racism (vis-a-vis the non-European world). With this program, liberal ideology tamed both of its competitor ideologies, the conservative and the radical/socialist, turning them into its avatars.

In the twentieth century, the dangerous classes were no longer to be found in the European world but had become the popular strata of the non-European world. Liberals attempted to replicate their formula for taming the dangerous classes: national independence and the development of underdeveloped nations substituting for suffrage and the welfare state. At first, this seemed remarkably successful. In the period 1945-1968, three noteworthy events occurred. The United States was able to impose via its undisputed hegemony order and peace among the great powers. The world-economy knew its greatest expansion in the history of the modern world-system, with its benefits trickling down to all parts of the world. And the great antisystemic movements (heirs of the radical/socialist ideology of the nineteenth century) came to power virtually everywhere - the Communists in Eurasia from the Elbe to the Yalu, the national liberation movements in Asia and Africa, populist movements in Latin America, and social-democratic movements in Europe and North America.

The combination of these three events seemed to validate the enormous optimism that all the ideologies - liberal, conservative, and radical/socialist - professed about the future. It suggested that reformism was in fact working, and that we were on the verge of a worldwide social convergence, overcoming the pattern of polarization in the world-system. But it was hybris, and the world fell hard. The world revolution of 1968 marked the first great expression of disillusionment by the popular strata. They expressed this disillusion less with the liberal center than with the antisystemic left, which they saw as having been unable to deliver what they had historically promised.

This cultural earthquake was followed by the world economic stagnation of production and profit during the 25 succeeding years which led to considerably increased polarization within and between countries, a process that is continuing apace. One after the other, the governments of the old left fell in the various zones of the world-system, as the popular strata withdrew their legitimation both of these movements and of the state as a reformist institution. The collapse of the Communisms in 1989 was simply the last major event in this sequence of delegitimation. The impact on the old antisystemic left was devastating. But it was no less devastating to the liberal center, who had counted for over a hundred years on the tacit support for their program that came from the old left, behind whose fiery rhetoric lay essentially the same program of governmental action.

If then a crisis or an earthquake began to be felt in the world of knowledge as of the 1970's, it was clearly not without connection to this crisis or earthquake in the world of political economy. The loss of optimism and certainty in one sphere was quite congruent with its reconsideration in the other. If order out of chaos became a slogan in complexity studies and multiculturalism a theme in cultural studies, it was surely not within evident analogy with what was serving as a new set of guidelines in the socio-political world.

Where then are we today? We are in the midst of the most difficult kind of period, socially and intellectually - a period of confusion, of violence, of uncertainty, and of transformation. It is a period which makes all its participants uncomfortable, and indeed fearful, for the immediate risks are enormous. But so are the long-run risks, since it will be during the next 25-50 years that we shall determine the main lines along which the world shall probably move for the next 500 years at least. The responsibility is thus quite awesome, while our vision seems least clear. But this is realistic. When we thought we had clear vision, we were in fact quite blind. Now that we acknowledge that our vision is blurred, we may perhaps be able to perceive dimly the directions in which to move.

What is needed is to recognize the TimeSpace in which we are living, a transformational TimeSpace. We must be clear on what will be the outcome, a new structural TimeSpace. We must be aware that our historical choice is between alternative, indeed conflicting, visions of the good society, and that the battle will be ferocious, if often surreptitious. We must finally be aware that we cannot engage intelligently in the socio-political battle without reconstructing the world of knowledge as an essential element in the battle. It is not just any convergence that we want, but a good one, a just one, an intelligent one, a substantively rational one.

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