JOURNAL OF SOCIOCYBERNETICS

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SOCIOCYBERNETICS traces its intellectual roots to the rise of a panoply of new approaches to scientific inquiry beginning in the 1940's. These included General System Theory, cybernetics and information theory, game theory and automata, net, set, graph and compartment theories, and decision and queuing theory conceived as strategies in one way or another appropriate to the study of organized complexity. Although today the Research Committee casts a wide net in terms of appropriate subject matters, pertinent theoretical frameworks and applicable methodologies, the range of approaches deployed by scholars associated with RC51 reflect the maturation of these developments. Here we find, again, GST and first- and second-order cybernetics; in addition, there is widespread sensitivity to the issues raised by "complexity studies," especially in work conceptualizing systems as self-organizing, autocatalytic or autopoietic. "System theory", in the form given it by Niklas Luhmann, and world-systems analysis are also prominently represented within the ranks of RC51.

The institutionalization of sociocybernetic approaches in what was to become RC51, the Research Committee on Sociocybernetics of the International Sociological Association, began in 1980 with the founding of an ISA Ad Hoc Group and proceeded with the organization of sessions at succeeding quadrennial World Congresses of Sociology. The eventual RC51 became a Thematic Group and then a Working Group. Finally, in recognition of its extraordinary success (growing from some 30 members in early 1995 to 240 in 1998), the group was promoted to the status of Research Committee at the 1998 World Congress of Sociology in Montreal.

Over these past two decades, sociocybernetics has attracted a broad range of scholars whose departmental affiliations represent the entire spectrum of the disciplines, from the humanities and the social sciences through the sciences, mathematics and engineering. Furthermore, the many countries of origin of these RC51 members attest to the wide international appeal of sociocybernetic approaches. Within this highly diverse community, there is wide agreement on some very general issues, for instance, on developing strategies for the study of human reality that avoid reification, are cognizant of the pitfalls of reductionism and dualism, and generally eschew linear or homeostatic models. Not surprisingly, however, there are also wide divergences in subject matter, theoretical frameworks and methodological practices.

Many have argued that models developed for the study of complexity can be usefully appropriated for the study of human reality. Moreover, however, the emphasis in complexity studies on contingency, context-dependency, multiple, overlapping temporal and spatial frameworks, and deterministic but unpredictable systems displaying an arrow-of-time suggest that the dividing line between the sciences and the historical social sciences is fuzzier than many might like to think. What is more, in the humanities, the uniquely modern concepts of original object and autonomous human creator have come under serious attack. The coincidence of these two phenomena substantiate the impression that across the disciplines there may be observed a new concern for spatial-temporal wholes constituted at once of relational structures and the phenomenological time of their reproduction and change.

In this context of rich history and exciting possibilities, the Research Committee on Sociocybernetics of the International Sociological Association extends an open invitation through the **Journal of Sociocybernetics** to all engaged in the common quest to explain and understand social reality holistically and self-reflexively without forsaking a concern for human values--human values not construed simply as a matter of individual ethics, but conceived as an integral part of a social science for our time.

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FIRST-ORDER SEMANTICS AND ARTIFICIAL INTELLIGENCE

Andrea Pronzini[*]

Sociology's growing interest in artificial intelligence (AI) necessitates an increased dialogue between the two disciplines (*e.g.*, Rammert 1995). In this perspective, this paper analyses, on the basis of Niklas Luhmann's theory of social systems, some aspects of artificial intelligence with the belief that such an approach can provide an original contribution to sociological research on artificial intelligence[1] as well as important cues for an interdisciplinary reflection on the subject.

In this paper, AI is considered as a discipline rooted in what we define as first-order semantics. By first-order semantics we are referring to a conceptual heritage that arose with the communicative innovations stemming from the use of writing. It represents the formalisation of first-order observations at the level of semantics.[2] Establishing a link between AI and this type of semantics not only implies diminishing, to a certain extent, the revolutionary image of this discipline, but also demonstrates how AI is rooted in a conceptual heritage that does not allow for appropriate consideration of the cybernetic processes that form its initial basis. Indeed, first-order semantics prove insufficient to systemize cybernetic processes.

With these preliminary statements in mind, a systemic approach to AI reveals how the questions that steer AI research do not fully grasp the potentialities of the computer. These questions emerge from the conceptual categories of the first-order semantics, which are inadequate for dealing with cybernetic processes and for illustrating, more generally, the meaning that computers can have for society. Our goal then is to prod AI research into reflecting on some of its founding presuppositions, which we hope to accomplish by basing our argument on a theory which pushes beyond first-order semantics. We will focus on the epistemological and sociological aspects of artificial intelligence rather than outline its technical details, a task which would exceed the limits of this paper.

We will begin with a brief description of the first-order semantics and then focus our

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[1] We therefore refute Wolfe's hypothesis (Wolfe 1991), according to which the problems of AI are proof of the inadequacy of Luhmann's system theory.
[2] By first-order observations we mean those of "the objective world". This kind of observation must be distinguished from so-called second-order observations, which refer to observations of observers (see Luhmann 1990a: 14 ff.).

analysis on the following points:

We will first examine the long-standing controversy over a computer's ability to think. This question arose before the official birth of AI, later establishing itself in AI's cognitivist paradigm. To a large extent, this question has characterized and still characterizes the discussion between advocates and critics of AI (see Churchland and Churchland 1990; Churchland 1995: 227 ff.; Searle 1990; Wertheim 1997; Sistemi intelligenti 1998: 3-84). We do not intend to give an affirmative or a negative answer, but to demonstrate that this is a badly formulated question.[3] At first glance this question, which aligns technology with cognitive activity (historically considered opposite poles in the western thought[4]), appears to be rather innovative; however, it is nothing more than the consequence of first-order semantics confronting a technical product that cannot be assimilated into its conceptual categories. In other words: we are not interested in asking whether computers can think, but rather in reflecting on the extent to which asking this question can help us grasp the meaning of the computer and its implications for society. According to the systemic theory of society, the understanding of the meaning of the computer can only stem from reference to society as a social system whose constitutive element is communication.

Secondly, we will briefly examine some main ideas of AI's connectionist paradigm, which considers the computer to be the most suitable means to study cognitive processes, including those of the human mind (see, for instance, Bara 1990). This paper will demonstrate that computer-based cognition research is necessarily bound by the structural limits of first-order semantics. According to the systemic theory of observation (see Luhmann 1990a, 1990b: 68 ff.; Esposito 1992), the computer-based study of cognition results from a semantics that is not yet suited to deal with observers in their specificity.

Lastly, we will explore AI's approach to "intelligence" in a broader sense. If we refer to communication as an emergent reality order not reducible to the psychic systems (Luhmann 1984, 1996b), we can criticize some elements that AI's cognitivist and connectionist paradigms share with newer developments such as research on distributed artificial intelligence and on artificial society models based on multi-agent systems. We attempt to point out how these fields of research are unable to grasp the meaning of the computer with respect to intelligence. The systemic theory of society can provide an alternative approach to the definition of intelligence and above all to the role of the computer—if considered not on the basis of its (presumed) analogies with psychic systems, but as medium of communication—with regard to new forms of social intelligence.

FIRST-ORDER SEMANTICS

With the concept of "semantics", Niklas Luhmann indicates the conceptual heritage of

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[3] Gotthard Günther already pointed out the misformulation of the question at the beginnings of AI research (1953, 1955, 1963), but it is significant to note that this doubt was not taken into further consideration.
[4] Actually, the attempt to disassociate cognitive activities from man began with the idea of formal symbol operations (see Krämer 1988). Nevertheless, one should not forget that laws initially meant to guide mental activities later turned into indications about the functional modalities of thought (Krämer 1993: 338).

society (see Luhmann 1980: 9-71). Semantics must be distinguished from the actual operations of observation. This means there may be some discrepancy between the two. In other words, nothing ensures that what takes place on the level of communication is reflected in the concepts that are at society's disposal, and is therefore observed and described adequately.

First-order semantics refers to a conceptual heritage that arose from the new possibilities of communication opened by the medium of writing. On the one hand, writing doubles communication at the level of operations (Luhmann 1992c: 33) and therefore enables second-order observations: a written text can be observed easily and compared with others texts. On the other hand, writing leads to the conceptual formalization of first-order observations, that is to say of what, at the level of operations, already exists with language: the preserved communication reflects the distinction between thing and name (which is the presupposition of language), between perceptual context and communication. Language allows for the differentiation between an observing system and the external world. Thus an ontology[5] that groups a set of objects, which do not coincide with the operations of the system, comes into being (Esposito 1992: 72). First-order semantics consists of concepts that reflect the detachment of communication from its immediate perceptual context. Although modern society is characterized by the *operational* normalization of second-order observations (Luhmann 1992a: 93-128), its leading concepts and ideas are still those of the old European tradition (that is, first-order).

We do not intend to give an exhaustive description of the first-order semantics in this paper; it suffices to illustrate some crucial points. First, one should bear in mind that in first-order semantics the distinction between communication and perceptual context is reflected in the distinction between subject and object. This is one of the leading distinctions made by first-order semantics and presupposes that the "facts" of the world necessarily fall on one of the two sides of the distinction, leaving no possibility for intermediate positions.[6]

According to the systemic theory of observation, a first-order observer, from its own operations, establishes structural unities (see Luhmann 1990b: 383 ff.); that is to say that the observer establishes identities that appear to him as independent from its operations (Esposito 1992: 93). At the level of semantics, this is reflected in the conception of the world as "universitas rerum" (Luhmann 1977: 88), as an aggregate of objective things, independent in their being from the "subject". This conception of the world, based on the subject/object distinction, implies that there is only one correct perspective for observing the world; this means that different observers necessarily make the same observations. In other words, the identity of the object presupposes that the object always appears the same to different observers (Luhmann 1997: 878). In this regard, first-order semantics primarily concentrates on Being, subordinating Thought to Being.[7] In this way, first-order semantics records the conditions of first-order observations, necessarily appearing to be observations of an objective

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[5] Luhmann (1997: 895) characterizes the leading Old European semantics as being ruled by the concept of "ontology", which derives from observations that rely on the Being/Non-Being distinction.

[6] In the Aristotelian Logic, this is ensured by the principle of the excluded third. In this paper, logic must be seen, according to Günther (1976: 255), as the formalization of a specific ontology. In this sense, the principle of the excluded third is a semantic correlate of the first-order observation.

[7] Luhmann speaks of a "primarily adaptive concept of Thought" (1984: 144).

world.[8] As a result, it bars the possibility of observing observers in their specificity, namely of properly considering the possibility of different observational perspectives. These limitations of first-order semantics clearly result from the modalities with which it treats the "subject". Later we will see how the same applies to AI.

Another very important characteristic of first-order semantics is its incapacity to acknowledge the existence of social systems that constitute an emergent reality level independent from psychic systems (Luhmann 1997: 23 ff.). Instead of a distinction between psychic systems and social systems, in first-order semantics we find ontological communication models that reduce the social to the psychic.

Among the variety of models and metaphors that characterize first-order semantics (see Krippendorf 1994), the one implicit in AI is the metaphor of communication as transmission of information. Communication is seen as a means to relate two subjects. Such a metaphor, which is receiving a great deal of criticism (see Benedetti 1989; Luhmann 1984: 191 ss.; Shanon 1989) including from AI insiders[9] (Winograd and Flores 1987: 76), implies invariability of the transmitted message: it has to be the same for Ego and Alter. In this communication model, the information has an intersubjective validity (Günther 1979: 134).[10] In short, the participants in communication transmit information whose Being is independent from their observational perspectives and whose meaning is accessible to both in the same way. To overcome these ontological presuppositions one must refer to a systemic concept of communication. We recall that in Luhmann's theory, communication, which represents the basic operation of social systems, is defined as unity of information, utterance and understanding (Luhmann 1984: 194 ff.). Based on this concept, "[i]t cannot be said that there is, first of all, an objective world which can then be spoken about; nor does the origin of communication lie in the 'subjective' sense-giving action of the utterance….The components of communication…cannot ontologically establish their externalization as qualities of the world, but they must search for it every time, passing from one communication to another" (Luhmann 1997: 72).

Now we will explore how these aspects of first-order semantics have led AI research to focus on poorly formulated questions.

COMPUTERS THAT THINK? A MISLEADING QUESTION

We will begin by briefly illustrating the interpretation of cybernetics that provided strong impetus for the development of the cognitivist paradigm of artificial intelligence. Then we will demonstrate how such an interpretation is neither thorough nor radical enough. One could object, countering that cybernetics did not play a leading role in further AI development.

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[8] "One of the consequences of an ontological world's section distinguishing between Being and Non-Being is that the identity of the Being must be presupposed: on the basis of these presuppositions of Thought there is no possibility to produce identity" (Luhmann 1990a: 19).

[9] Although in a less radical manner.

[10] Havelock (1995: 84 f.) has also pointed out dependency on such metaphors in societies accustomed to handling written language, that is to say in societies in which the first-order observation is a constitutive part of their semantics. See also Krippendorf (1994: 85).

Although this is true, the initial interpretation of cybernetics has implicitly conditioned subsequent AI research in a crucial way. Only recently has information science proclaimed—rightly—the need to re-evaluate the epistemological consequences of cybernetics (*e.g.*, Le Moigne 1992), and in this context, Luhmann's theory can unquestionably offer important cues for reflection.

The question of whether computers can think arose from some of the founding ideas behind the first-order cybernetics. The cognitivist AI paradigm adopted the idea that cybernetic machines such as computers, whose behavior *appears* to an observer to be guided by the skill of distinguishing between auto- and hetero-reference, emphasize the inadequacy of the distinction between Mind and Matter (see Wiener 1994). Insignificance of substance became one of the fundamental theses of cognitivism: one does not need a specific material substrate in order to form a system with cognitive skills; therefore, the capacity of elaborating information does not necessarily presuppose a neuronal system.[11] Cognitivism argues that cognitive processes are, instead, the result of rule-governed symbol manipulation. The well-known idea of symbols-processing machines combines these theses (Newell 1980, 1990; Pylyshyn 1980). These are cognitive systems whose functioning/behavior can be explained through their capability of manipulating symbols and whose adequacy can be judged by their problem-solving capabilities. For cognitivism, the analogy between man and machine does not lie in the "hardware", but in a capability for computing and organizing information (Simon and Newell 1994: 113) independently of a material substrate. The reason cognition ought to be viewed as computation

> rests on the fact that computation is the only worked-out view of *process* that is both compatible with a materialist view of how a process is realised and that attributes the behaviour of the process to the operation of rules upon representations. In other words, what makes it possible to view computation and cognition as processes of fundamentally the same type is the fact that both are physically realised and both are governed by rules and representations (Pylyshyn 1980: 113).

As we can see, based on the concept of the symbol, cognitivism explains cognition as representation in the form of a symbolic code in the brain or in the machine. The introduction of concepts such as the "cognitive impenetrability condition" (see Pylyshin 1980) that distinguishes functions linked to causal and biological laws from those whose explanation requires the concept of representations, changes nothing in the classical view of cognitivism, but rather strengthens its basic assumptions as outlined above.

From this general overview of the cognitivist paradigm, we can see the connection between artificial intelligence and the ontological premises that characterize first-order semantics. In fact, talking about symbols and representation implies an objective world. We purposefully do not include the analysis of further theoretical developments in cognitivism and related criticism, as our paper is not intended to provide exhaustive treatment of cognitivism.[12]

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[11] In order to highlight this aspect, cognitivism speaks of "medium independence" (Haugeland 1985: 58).

[12] We do not include the technical aspects of the representation of knowledge and problem solving, because this would lead the analysis too far. For an example, the interested reader is referred to the work of J.F. Sowa (see Sowa 1984; 1991).

Our purpose is to explore how the question, of whether machines such as computers think, arose. Based on the Turing-test (see Turing 1950), cognitivism argues that when the behavior of these machines is not distinguishable from that of a person, then it is legitimate to say that they think.[13] In this respect, AI points out that what according to the first-order semantics seems to be an object can, after all, be assimilated to the subject. Such statements only appear to be profanatory. Not only is AI not radical enough with regard to cybernetic theory and in questioning the distinctions of first-order semantics, but also paradoxically it is the logical continuation of it. Advocating well-known analogies between thought and cybernetic machines, AI debunks the subject, but by no means questions the primary subject/object distinction of first-order semantics. Nevertheless, it is exactly the abandonment of this distinction that represents the decisive step needed to describe cybernetic processes adequately.[14]

Cybernetic processes contradict first-order semantics: the retroactive phenomena studied by cybernetics, the elaboration of the concept of feed-back (Wiener 1994), and the idea of auto-referential machine control overturn the definition of the object as independent from the observer. A cybernetic machine is not confronted with an objective world that is independent from its operations. Processes and circular causalities, concepts central to cybernetics, lead us to affirm that it is no longer possible to observe reality adequately on the basis of structurally weak classical distinctions. Adopting the terminology of Gotthard Günther, it can be said that cybernetic processes act as a rejection-value compared with the subject/object distinction (Günther 1963: 33; 1976: 249). We note here the radical difference between Luhmann's theory of society and the theoretical background of artificial intelligence: they both do widely refer to the theoretical innovations of cybernetics, but with the decisive difference that AI does not renounce the classical subject/object distinction. By questioning the latter on an epistemological level, the systemic theory of society arrives at the de-ontologization of reality (Luhmann 1990a: 37). This de-ontologization of reality must not be confused with a questioning of the existence of the external world; rather, it means that the leading distinctions of what we have called first-order semantics are seen as contingent. Therefore nothing prevents us from starting, in the observation of the world, from the system/environment distinction (Luhmann 1990a: 37), in this way going beyond the structural limitations of the subject/object distinction. In the case of observing systems, such as social and psychic systems, knowledge is no longer considered a progressive approach to environmental data, but a construction of the systems bound to the complexity of their operations, and on the basis of which we always find the system/environment distinction.

Already at the beginnings of research on artificial intelligence, Gotthard Günther had questioned the validity of classical concepts in the understanding of phenomena such as those studied by cybernetics (Günther 1963: 31). He demonstrated how the theories elaborated in the context of first-order cybernetics could not be assimilated to the categories of two-valued logic. The two-valued logic represents "a specific form to take the observer into account and to place

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[13] It has been forgotten that, to a certain extent, Turing himself had recognized the dubiousness of the question of computers thinking. As a matter of fact, the Turing Test turned into an attribution problem regarding communication (see also Baecker 1995; Heintz 1995).

[14] The same applies to a theory of modern society (see Luhmann 1997: 868 ff.).

him in the world" (Luhmann 1997: 905): the form that records the conditions of first-order observations. Classical (two-valued) logic acts as an "obstacle épistemologique" (Bachelard) in the understanding of cybernetics. Cybernetic theories compel us to abandon the basic presupposition of the two-valued logic of the isomorphism between Being and Thought. From Wiener's axiom according to which information is not matter, we can in the same way assert that information is information, that is, it is not "Geist" or subjectivity (Günther 1963: 24). The recursive network of operations, the processes[15] and the circular causalities observable in cybernetic systems are, among other things, "Werden" processes which, according the Law of Identity of two-valued logic, are exclusively bound to the subject and thus are equivalent to the immaterial (Günther 1963: 24). On the other hand, in first-order semantics what is material is a Being identical to itself. But in cybernetics, processes that should characterize only the subject appear, in a sense, in an objectivized form.

The above explains why the comparison between first-order semantics and cybernetic processes necessarily results in a continuous oscillation between one side and the other of the subject/object distinction. As third possibilities are excluded, there is no other alternative: the computer is either assimilated to the subject, as cognitivism asserts, or it basically remains an object among others; it is impossible to not include it in one of the two possibilities mentioned. At this point one may legitimately wonder what a computer actually is. The way cybernetic machines operate led Günther to speak about a "third transcendency" that, precisely, cannot refer back to the innerness of the subject or to the objectivity of things. These are processes located between the two poles and therefore could never be situated on one or the other side of the subject/object distinction (Günther 1963: 36 ff.). However, Günther's third transcendency is not adequate.[16] He remains too tied up in the theoretical framework that refers to the conceptuality of the Philosophy of Mind. In the systemic theory of society, we can change the system-reference instead and speak of the computer as a medium of communication. This implies abandoning the belief that its meaning must necessarily be sought in its presumed analogies with psychic systems. This aspect can be seen in the exponential growth of phenomena such as the internet—which represents a sheer communicative use of the computer. If we really aim to find phenomena analogous to those of psychic systems, then these must be identified with communicative processes, where the analogies are given by the fact that both psychic and social systems operate in the medium of meaning (see Luhmann 1984: 92 ff.). Therefore, what is interesting about computers are the modalities with which they intervene in the meaning constructions of the social system.

We do not deny that AI has also been interested in the topic of computer communication. On the contrary, this aspect has been of long-term interest in AI and is still considered very important (see, for instance, Negroponte 1995: 130). However, it is significant to note that AI has always approached this topic from a theoretical stance that does not recognize communication as a construction of meaning independent from psychic systems.

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[15] "The most fundamental concept in cybernetics is that of 'difference', either that two things are recognizably different or that one thing has changed with time.…All the changes that may occur with time are naturally included" (Ashby 1956: 9).

[16] The peculiarities of computers can be better illustrated through the operation/observation distinction; however we do not want to touch on this subject here.

Turing hinted at communication-computers by approaching the question of computers thinking in a communicative experiment. If a man is not able to distinguish typewritten responses given by a machine from those given by a man (that is: if someone "communicates" with a computer program without recognizing it as such), then it can be said that the computer thinks—this summarizes Turning's thesis. The influence Turing had on the further AI approaches to this topic is clearly visible, for instance, in the now-classic program "Eliza".

Whatever its intentions,[17] AI computer-language-communication research does nothing more than reinforce the idea that the machine can act as a communicative partner.[18] However, it is more interesting to explore how the computer affects communication (Luhmann 1997: 304); this approach focuses on changes in communication and therefore on the transformation of society favored by a new medium of communication. We consider the starting point to be that only communication can communicate (Luhmann 1996b: 261). As a result, we speak not of communication with a computer, but of computer-mediated communication (see Esposito 1993, 1995a; Gingelmann 1994). The computer, unlike other media of communication, processes the hetero-referential component of communication: the information. This is one of the computer's most relevant peculiarities.

We know that in Luhmann's theory of society, information is not material-objective data, but that it is generated in the social system. Therefore, the simple statement that computer-mediated communication has something to do with the processing of information does not provide sufficient explanation. We have to be more precise: another form of information processing is added to the one directly carried out in the communicative process, the machine's elaboration of the data introduced in it (see Esposito 1993). The computer "is the first medium that intervenes directly (like a machine) on the information in question: the only task facing the book is to spread the uttered information (the same information) to a higher number of addresses—the computer, on the contrary, 'processes' it" (Esposito 1995a: 96). In this manner the unity of utterance and understanding is definitely dropped: the one who has introduced the data does not know what another user will look up, because the data has in the meantime been processed by the machine (Luhmann 1997: 309). In such a form of communication, there is no possibility for—and probably not even any interest in—the Ego referring to the perspective of the Alter. Computer-mediated communication seems to have no connection with any attempt to guide the perspectives of Ego and Alter to unity. We will take a further look at this aspect in the final section.

COMPUTERS AND THE STUDY OF COGNITION: CRITICAL REMARKS

The relation between computers and human thought assumes a different form in the connectionist paradigm of artificial intelligence, at least in its variations that are strongly related to cognitive science and of particular interest to us.

The connectionist paradigm of artificial intelligence can be meaningfully differentiated from cognitivism in the role it assigns to the computer: connectionism's goal is not to

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[17] Nowadays this research concentrates primarily on building user-friendly interfaces.
[18] So also Fuchs (1991: 4).

reproduce an equivalent of the human mind, but at most to simulate it (see Bara 1990). Rather than focusing on the result, it mainly concentrates on the intermediate processes of human cognition, which should be implemented with exactitude in the computer—even if this requires that we reproduce mistakes. We do not want to explore these distinctions in too much depth; however, we are interested in the considerable emphasis of this nature that is being placed on the computer: the idea is that the computer is the most suitable means to study cognitive processes in a scientific manner, whatever their nature may be.

Another essential difference between cognitivism and connectionism lies in the different emphasis they each place on the neurophysiological system: it is indicative that connectionism speaks explicitly of a "neurally grounded theory of meaning" (Churchland and Churchland 1990: 31). In this sense, connectionism marks a return[19] to the idea that in order to approach the comprehension of cognition in its different manifestations, it is necessary to take as a base the medial substrate of human cognitive processes.[20] Using the operative modalities of the brain as inspiration, a computer without any central unity was constructed, taking for granted that information is the result of the interaction between units[21] that send inhibiting/exciting signals to others units (McClelland, Rumelhart and Hinton 1986: 10). We then have units—called nodes—that are interconnected in networks that operate in parallel. Connectionist models are designed to fulfill a task on the basis of an architectural specification, that is to say a number of units, their arrangement in strata and columns, the pattern of connectivity and the strength of each connection. It is also worthwhile to bear in mind that in connectionist models the signals that the different units send to each other are not of symbolic, but of numeric nature (Churchland and Sejnowski 1989: 190 f.).

Connectionism research, grounded in the fundamental role computers play in the scientific study of cognition (Bara 1990; Parisi 1990), intersects with cognitive science research.[22] The emphasis on the computer as a model for human thought already reveals to what extent a discipline is related to cognitive science (Gardner 1985: 53). Connectionism claims a solely cognitive interest in the human mind (Parisi 1990: 374) and views itself as the scientific branch that is truly capable of shedding light on "cognition" (see for instance Churchland and Sejnowski 1989). With this in mind, it is interesting to note how connectionism explicitly seeks to resonate with the field of psychology (Rumelhart and McClelland 1986: XI).[23]

We have seen that first-order semantics concentrates on Being, and that as such it is not able to adequately handle observing systems in their peculiarities. First-order semantics defines the conditions of first-order observations, i.e. of observations that presuppose a world of objects whose being is independent from the operations of the observer. Characterizing first-

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[19] Actually this idea was already present initially in cybernetics. See, for instance, Ashby's project for a mechanical brain (1952).

[20] Avoiding, however, any form of reductionism, as pointed out, for instance, in Parisi (1996).

[21] Which are conceived of as neurons (see Churchland and Sejnowski 1989: 190).

[22] Whose difficulties of definition are, according to Bara (1990: 18), due to the strong intersection with artificial intelligence. Therefore, Parisi's (1996) juxtaposition of cognitive science and connectionism is misleading.

[23] This is not new for AI. Already at its beginnings and then with cognitivism, AI has criticized behaviorism (see Johnson-Laird 1988: 16 ss.), and the analogy between the computer and the human mind has been an important step towards overcoming behaviorism.

order semantics in such terms is obviously not equivalent to asserting that the first-order semantics tradition has not been concerned with the observer; actually, the passage to a functionally differentiated society has given rise to the necessity of finding new forms of semantics for the subject and the individual (see Luhmann 1989a: 149-258). It does, however, mean that the first-order semantics approach to the subject does not succeed in capturing its fundamental characteristics, as can be seen first in Philosophy of Mind and later in psychology: both have dealt with the "subject" by remaining based in the conceptual framework that characterizes first-order semantics. In systems theory, observing an observer means introducing a contingency value. So not only can we assert that the data of an observer's world is not independent from the observed observer, but also that a different observation is possible (on this, see Esposito 1992: 175 ff.). We recognize the divergence between different perspectives of observation without any requirement to return to unity. These are precisely the possibilities precluded by first-order observations. The discrepancy among observations, the incommensurability of Ego and Alter that is at the basis of communicative processes, finds no adequate treatment in a semantics of this form.

There are sufficient historical examples showing the limitations of subject-focused first-order semantics: in the case of Leibniz's monads, the unity of different observations is viewed in the absolute; in transcendental philosophy, it is guaranteed by the concept of a transcendental subject which does not recognize two non-assimilable subjectivities and thus is incapable of capturing the aspect of sociality, the difference between Ego and Alter (Luhmann 1995: 159). And again, in other contexts we find appeals to concepts such as intersubjectivity, rightly branded by Luhmann as "*Verlegenheitsformeln*" (Luhmann 1995: 169).[24] By this, we do not intend to discredit, in a few words, these philosophical traditions of European semantics. We simply want to signal some examples of the strategies to which first-order semantics has been applied in an effort to support its fundamental conjectures, when it has been faced with "subjectivity". Another quite significant sign of the problems first-order semantics has had to deal with due to its approach to the "subject" can be seen in its oscillating between the two sides of the subjective/objective distinction, analogous to what we have seen with respect to the question of computers thinking. Psychology, which developed from German Idealism, concentrated at first on concepts such as consciousness, "*Innerlichkeit*", or introspection. This subjectivism, which cannot explain how, through introspection, we can succeed in drawing conclusions about others, set itself up for strong criticism of introspection as a method of psychology. This critique was followed at the middle of 19th century by the clear achievement of experimental methods (see Sachs-Hombach 1993: 31 ss.). Also, James's pragmatism opposed subjectivism, until later an "exaggerated" form of objectivism was reached with behaviorism, which is precisely what artificial intelligence has sought to overcome.

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[24] It is worthwhile pointing out that there are cases in which first-order semantics reaches its limits without reaching a breaking point. Take for example the reflections expressed in Schelling's *System des transzendentalen Idealismus* (Schelling 1992), where the difference between a "*mit sich selbst identischen Sein*" and a "*im sich werdenden Sein*" is pointed out, and where we read that the Ego can be reduced to an object only by itself, and not by another one. These are important insights, which nevertheless did not result in serious consideration of the "Thou". As a matter of fact this is not necessary, because of the concept of transcendental ego (see Günther 1959: 69).

Yet we cannot consider that AI has accomplished this task. As a matter of fact, a continuity between connectionism and the first-order semantics tradition can clearly be seen in the systematic reformulation of some of Günther's considerations expressed in *Das Bewusstsein der Maschinen* (Günther 1963: 43). According to Günther, the construction of machines such as computers represents an attempt to overcome the constitutive distance between Ego and Alter, which is, in Luhmann's theory, a basic condition for communication. From the AI perspective, two mutually inscrutable psychic systems, which cannot share their own psychic processes, can, in a computer, technically objectify a subjectivity purified from those subjective peculiarities, which also remain inscrutable to the self-observing psychic system itself. Actually, a psychic system engaged in self-observation will never succeed in capturing and describing itself in its completeness, nor in deducing from this self-observation indications about others.[25] Instead, as Günther (1980: 230) has stressed, with cybernetics we have the first attempt to elaborate a theory concerned with transferring subjectivity as a process to the external world, trying to render subjectivity "accessible" in some way. In this sense, artificial intelligence can be seen as the attempt to develop an objective study of subjectivity, based on empirical cognitive processes that do not belong to any subject, but are *neutral* instead. The discrepancy among different perspectives of observation in this case is no longer led back to unity through concepts such as the "transcendental" or the "intersubjective", nor through the aggregation of empirical data. The discrepancy is neutralized through implementation in a machine of a subjectivity that is presumed to be, as it were, in a pure state. In this way, subjectivity seems to become observable in its entirety as an objective fact. In this technical transposition of subjective processes, what seems to remain is that which is generally binding and possessed by all the Egos and therefore is public in a very deep sense (Günther 1963: 43).

However, the only truly binding thing for mutually inscrutable psychic systems is communication. As a result, the point is not the reproduction of a neutral and universally binding consciousness. First, it is quite difficult to see the benefits of having at our disposal a neutral subjectivity, when perhaps the most fascinating and distinctive aspect of psychic systems is their idiosyncrasy. No more enlightening an outlook comes from the variant which abandons the idea of a neutral consciousness in order to simulate a truly existing consciousness instead: which one of the six billion psychic systems that operate under condition of absolute intransparency should exercise the office of model? Moreover, what benefits would we gain from this simulation? The only solution for two psychic systems in the situation of double contingency (see Luhmann 1984: 148 ss.) is communication. Even if participation in communication does not allow them to render their own thoughts accessible—indeed it amplifies the discrepancy between psychic systems and highlights the one between psychic systems and social systems,[26] communication represents the only external support that psychic systems can refer to. It would therefore be desirable to evaluate the extent to which cognitive

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[25] In newer cognitive science works, the necessity to overcome the method of introspection is still highlighted (see for instance Churchland/Sejnowski, 1989).

[26] "Participating in communication makes it…always painfully clear how deeply the boundaries between psychic and social autopoiesis are marked and how senseless the idea is, with which a tradition tempts us: that people can communicate" (Luhmann, 1995: 200).

science could benefit from referring to a conceptualization based on the distinction between psychic systems and social systems.

COMPUTERS AND SOCIAL INTELLIGENCE

The last point we want to develop is a critique of the concept of intelligence and above all the nexus between computers and intelligence expressed in AI. We would also like to provide an alternative interpretation of the relationship between intelligence and computers.

In cognitivism the basic idea of symbol-manipulating machines implies that intelligent behavior requires the capacity of representing the world correctly; it is assumed that the behavior will be successful to the extent that the representation of the situation is correct. We also find these arguments in the now-classical work of Newell and Simon (1972) on "human problem solving". The problem-solving procedure in its classical version has been described as a process that follows the following steps: the characterization of the problem as a task environment (definition of possible actions and of the goals from which to derive the rational action), the representation of the task environment as a symbolic structure, the search among possible actions and the choice of the one that can assure reaching the goals (Winograd and Flores 1987: 22f.). As Newell says, intelligence can be seen as the level of approximation to the so-called knowledge-level system, that is to say that systems are intelligent "to the degree that they can bring the knowledge in the system to bear on the system's goals" (Newell 1993: 36). Intelligence is thus seen as the capacity to represent a objective world correctly—an idea clearly permeated with concepts characteristic of first-order semantics. Therefore, it is easily understandable that AI has developed so-called expert systems, that is to say programs which, if compared to human attempts, are able to give analogous or even better performances in a specific field (Bara 1990: 66).[27]

Expert systems should represent the subject that vouches for the right observation of a world to which corresponds a single correct observation. Delegating specific decisional authority to such a program seems to be a means to guarantee an observational perspective that is totally free from subjective distortions. Different perspectives of observation are eluded in expert systems; they are considered only when different human experts are interviewed, but this knowledge is then implemented in a computer program that leads them back to unity, to a unique perspective of observation that should be the right one. The practical problems of expert systems are then explained through the reluctance of the consulted experts to explicate their knowledge. Yet this attribution of the failures of expert systems to presumed reticence of the specialists also demonstrates that AI research is based on the idea of an objective world that can be correctly represented (see also Wehner 1995: 264).

The failures of expert systems certainly cannot be explained in this way. Again, it is necessary to make a radical reference to the social, with the acknowledged understanding that social systems are independent in their reproduction from psychic systems. Lacking the possibility of recognising the existence of an emergent system such as the social one, it is

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[27] AI speaks of services restricted to "micro-worlds" (Haugeland 1985: 185 ff.).

impossible to perceive that not-knowledge is a constitutive part of communicative processes that by no means can be reduced to the not-knowledge of psychic systems: "communication is founded in not-knowledge….Communication itself [produces and tests] the not-knowledge necessary to its further function. It depends on the unequal distribution of knowledge/not-knowledge. It is based on a form of knowledge which at the same time always carries forward another side of what is not yet known" (Luhmann 1997: 39 f.). The idea that knowledge, and therefore not-knowledge, belongs to subjects, is characteristic of a discipline guided by first-order semantics, and is strengthened by the dynamic of communication through processes of attribution that reduce communication to action (Luhmann 1990b: 60f.). In any case, if we consider the social nature of knowledge, intelligence cannot be defined on the basis of concepts such as symbol and representation (see Simon 1994: 20). Asserting that "[a]t the root of intelligence are symbols, with their denotative power and their susceptibility to manipulation" (Simon 1980: 35) sounds implausible.

As for connectionism, even if it distances itself from the cognitivist concept of intelligence, it does not perceive the broader meaning of communication with respect to intelligence. Connectionism distances itself from the concept of rule: it emphasizes that cognitive human behavior does not often follow any rules and therefore it renounces the implementation of rules to determine the global behavior of neural networks. The behavior of the system is the outcome of interactions between several units of the network and is it not deducible and not foreseeable, because of the non-linearity of the interactions. The observer can surely identify some regularities, but these do not illustrate the functioning of the network: "The neural network behaves as though it follows some rules, but in reality it has no rules, nor does it apply rules" (Parisi 1996: 55). It is no longer necessary to refer to the concept of rules to explain intelligent behavior. The possibilities of connectionism seem to be related to its renunciation of the concept of rules (McCloskey 1993), or at least related to the shift towards the idea that cognitive systems are characterized by soft laws; this means that instead of the hard rules that are expressed in cognitivism, for an adequate description of cognitive systems we should refer to *ceteris paribus* generalizations (Horgan and Tienson 1996: 197 ff.). As a result, it is not surprising that connectionism focuses more and more on paradigms of complexity and therefore on the study of internal dynamics (Compiani 1996: 60 f.). The fact that neural networks show intelligent behavior but do not follow any rules allows connectionism to assert that in human intelligence the reduction of behavior to rules is nothing but the result of an external attribution (Parisi 1996). In this sense, it seems that connectionism's concept of intelligence approaches the systemic one, but a substantial difference remains between the two theories: without the possibility of referring to communication as an autopoietic system, connectionism only succeeds in asserting that it is incorrect to use an external product to explain the way the mind works.

Now let us turn our attention to newer AI developments that are based on the idea of distributed artificial intelligence (DAI) and multi-agent systems (MAS). Unlike cognitivism and connectionism, this research calls on an understanding of intelligence that takes expressly into account its social dimension and actually uses this as a starting point for simulations. Questions about the modeling of "social facts" and of social actions are at the core of this research. It is no surprise then that these approaches make reference to the social sciences and

assert that social simulation can shed light upon topics that are objects of great discussion in the social sciences, such as the micro-macro problem (see Conte and Castelfranchi 1996; Conte et al. 1997). Even if it is premature to evaluate the possibilities of success of such research, we can already observe some of the ideas that are debatable. Distributed artificial intelligence (DAI) explicitly recognizes the limits of the methodological individualism which characterizes cognitivism and it describes problem-solving as the outcome of the behavior of a group of individuals, of a collective action that lies outside single agents (Lenay 1994: 1). According to Bond and Gasser (1988: 10), the basic problems that DAI must address are (among others): how a group of intelligent agents describes and allocates problems and synthesizes results, how they act coherently in processes of decision-making, and how they recognize and reconcile different viewpoints and conflicting intentions in order to co-ordinate their actions. As a matter of fact, newer developments in AI concentrate on artificial systems that include more interacting agents and that are modeled on the attempt to illustrate, for instance, processes of learning, co-operation, and communication (see Weiss 1996). The effort is to evaluate the emergence of a group's cognitive behavior on statistical grounds, with the question of "how it is possible that from an enormous variety of inferential schemes and judging capabilities, from different opinions and dogmas, from distinct perspectives and opposite point of views, after a continual interaction, a more uniform (if not unique) vision of the world emerges" (Dragoni and Giorgini 1996: 151).

Researchers have put their hope in work related to "artificial societies", whose goal is to study how individual behaviors generate societal regularities. This research is based on multi-agent models and places itself in clear opposition with models based on aggregated data that suppress individual heterogeneity (Epstein and Axtell 1996). Social simulation based on multi-agent systems starts from the fact that it has become progressively clear that the efficiency of the system is proportional to the degree of autonomy of the local units. That is why the interest has shifted more and more to the question of how it is possible to obtain co-ordination and co-operation from autonomous agents involved in a common task (Conte et al. 1998: 1). Of particular interest to us is the fact that according to advocates of social simulation, DAI and MAS suffer respectively from a pre-packaged view of co-operation, that is to say from a conception of co-operation that already exists objectively, and from "hypercognitive fallacy", a concept that designates the fact that social agents are seen as endowed with an innate social awareness and mutually transparency (Conte and Castefranchi 1996: 3-19). Starting from these assessments, the point is then to consider the objective precognitive basis, which models the actions of social agents. In the case that the agents become aware of the precognitive conditions of social actions—as in the case of social norms—Castefranchi (1998) speaks of "cognitive emergence", a phenomenon which is particularly relevant in the process of the so-called "immergence", that is, the process through which the macro-level influences the agent's mind (Castelfranchi 1998: 27 f.).

What interests us is that all this new AI research, which explicitly takes into account the social dimension, has not been able to detach itself from the reference to individuals. For instance, Conte and Castefranchi (1996: 188-208) see the "social mind" of its members as the basis of a collective agent's action. These are further examples of how AI tries to refer to the social without being sufficiently radical. However innovative and stimulating it may be, this

research, notwithstanding all efforts to consider the emergent aspects with regard to social phenomena, does not succeed in perceiving that the true emergent social phenomenon is communication, conceived as the constitutive event of social systems. Viewing psychic systems in the environment of social systems means that beliefs and feelings, social ideas, by no means can explain the modalities of functioning of the social systems:

> No operation of consciousness can ever be communication just as no communication can ever be an event of consciousness. Systems remain orthogonal to each other. This means that they can never observe the same.…The autopoietic reproduction of either type of system remains necessarily split.…[What], in any momentary coincidence, communication makes out of communication, remains something completely different from what currently felt, consciously experienced thought makes out of thought (Luhmann 1996b: 264 f.).

We now turn to the task of illustrating another view of how the computer can be related to intelligence as conceived of in social terms. This is not the right place to provide an exhaustive definition of "intelligence". It suffices to bear in mind that when we talk about intelligence, from the systemic theory of society's point of view, we cannot neglect referring to communication (see Luhmann 1992b; Baecker 1995).[28] This means that we are interested in seeing how the computer, as a medium of communication, binds itself to intelligence as understood in a truly social sense.

As we have already considered, the meaning of the computer as a medium of communication can be seen in forms of communication in which the computer intervenes on the information. That means that the information undergoes an elaboration that is not controllable by either the Ego or the Alter (see Esposito 1993). Luhmann points out that the computer represents a "forms' marking which enables a richer distinguishing and indicating" (Luhmann 1997: 305). We now have to ask ourselves how and in which sense the computer can allow these more complex distinctions. A hint comes from the considerations of Weston and von Foerster (1973: 356) who emphasize that computers, as "language-oriented systems", are open to the external definition of goals, while artificial intelligence is faced mainly with so-called "taciturn systems", that is to say that an external observer can assert that the systems follow their own goals. We cannot deny that AI takes advantage of this openness to the outside, but once again it is not sufficiently radical. As a matter of fact, the openness to external programming is used mainly to develop systems that can learn on their own and eventually set their own goals. Or, in the case of classical expert systems, we find the implementation of clearly defined goals. The meaning of the computer as a language-oriented system is observable in communicative usage of computers which benefit from the fact that "*the purpose of computers is to have no purpose*" (Esposito 1996: 254).

First, let us contemplate the architecture of computers, which is divided into many programming levels that are characterized by a great deal of autonomy. Programming at one level happens quite independently from programming at other levels: "The many levels in a complex computer system have the combined effect of 'cushioning' the user, preventing him

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[28] This should not be confused with an intention to reduce the concept of intelligence exclusively to the social system: without any doubt the characteristics of psychic systems play an important role in knowledge and intelligence.

from having to think about the many-level goings-on which are most likely irrelevant to him" (Hofstadter 1980: 296). Newer developments in computer science have reinforced this quite traditional approach to the distribution of autonomy. The no-purposeness of computers clearly results from the programming concept behind so-called "fourth generation level languages": some programs are created to allow the user to structure his own programming of the computer (see Esposito 1996). In this way the computer is open to an uncontrolled definition of forms and distinctions. The renunciation of purpose does not mean that the computer has no more utility, but rather guarantees the possibility of facing different contingent situations in a non-arbitrary way (Esposito 1995b: 175). Such uses of the computer openly contradict AI's presuppositions and clearly reveal how the transformation produced by a new medium is "introduced *in* communication *through* communication. There is nobody outside the system who could plan and lead it. The system evolves through auto-reference" (Luhmann 1989b: 12).

Considering our statements on intelligence and on the peculiarities of computer-mediated communication, we see that the point is not to have a computer that can allow, based on correct observations and evaluations, adequate decisional criteria in order to face problematic situations. The crucial point is represented by having at our disposal *a medium that guarantees forms of communication that detach themselves from the necessity of unifying the different perspectives of observation*. This can be observed in telematic networks, whose success is probably due to the lack of a supra-contexture (Esposito 1996: 256). Certainly, printing and then mass media, which generate a second reality free from any constriction to agreement (Luhmann 1996a: 164), brought the beginning of the end of the unitary semantics condition, although the mass media continue to give the impression that such semantics still exist. However, the forms of communication offered by computers represent a novelty in the sense that they are, without any doubt, more radically incompatible with a unitary semantics. Therefore intelligence is not a correct observation of the world with help of the computer, but rather an explosion of contingency through the computer. The computer seems to be a medium of communication that radicalizes contingency in modern society, a medium that renounces unifying the perspectives of Ego and Alter: as already noted, whoever understands cannot reconstruct the perspective of the utterance. This increase of contingency is also due to the fact that with the computer—continuing an evolution already begun with other media of communication such as the television—the whole world becomes communicable, with the exclusion of sincerity (Luhmann 1997: 311), and thus there is an increase in the discrepancy between what could be communicated and what, effectively, is being communicated.

At the moment it is impossible to foresee all the implications of this new intelligence. In any case, if it is true, as Luhmann asserts, that the only possible type of rationality for modern society and its systems lies in the "maintenance and exploitation of differences", in the in a realization of the potential of the irritability of the system (Luhmann 1997: 185), then it would be safe to assert, from the point of view of our argument, that the computer is opening the way to communicative modalities that seem to be approaching the rationality needed by modern society. In this respect, first-order semantics not only precludes a full understanding of the computer, but also reveals its own limitations. We can add that perhaps the computer will be the medium capable of pushing society further towards the normalization of the reflection, at the level of semantics, of all the consequences of a society based on second-order

observations, but which still lacks the corresponding semantics.

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BEING HOLISTIC ABOUT GLOBAL ISSUES:
NEEDS AND MEANINGS

Bernard Scott[*]

> the significance of theory will always remain that
> a more controlled method of creating ideas can
> increase the probability of more serviceable
> results—above all, that it can reduce the
> probability of creating useless excitement.
> --Niklas Luhmann
>
> The self today is for every one a reflexive project
> —a more or less continuous interrogation of past,
> present and future.
> --Anthony Giddens

As sociocyberneticians we are perhaps agreed that the problems we face are global. We may also perhaps agree that our global problems need to be tackled holistically, addressing both the first-order complexity of interconnected observed systems and the second-order complexities of communities of observers.

Cybernetics as the science of control and communication (Wiener 1948), efficiency of action (Couffignal 1960), and circular causality in biological and social systems (Von Foerster et al 1953) invites us to be *holistic* (Beer 1967) and transdisciplinary (Ashby 1956) in our thinking. With sociocybernetics (Geyer 1995), we have an explicit concern with human social systems. The scope and scale of human action on this planet invites us to be *global* in our concerns.

BEING HOLISTIC

As noted, holism implies being transdisciplinary (I use the prefix "trans" to imply both meta and interdisciplinarity). As a cybernetician/systems theorist, one is not "a political

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scientist", "an economist", "a social psychologist", "a sociologist", "an ecologist", or "a meteorologist" only; one is all of these.

Theoretically we may distinguish first and second-order concerns. First-order cybernetics distinguishes, observes, measures and predicts the behavior of observed systems. Second-order cybernetics adds to that a concern with how observers distinguish themselves and their worlds and how they, as actors, interact in order to bring forth and maintain "forms of life" (Wittgenstein 1953; Margolis 1989). The cybernetician accepts explicit reflective recognition that second-order cybernetics is reflexive—that he or she is just such an actor and, as such has responsibility for the worlds he or she brings forth.

First-order methodology explicitly recognizes similarities and differences between disciplines; all are concerned, in one way or another, with distinguishing and measuring systems.

Second-order methodology reminds us that each discipline has brought forth a world, a "universe of discourse", with metaphysical assumptions, theoretical and methodological paradigms, values and goals. It works to bring practitioners together as reflective practitioners, ready to question disciplinary assumptions (to take risks), to look for new insights and problems to be solved in the "interstices" and "overlaps" of disciplines—characteristics well represented in papers presented in RC51 venues.

Methodologies also include the explicitly second-order and qualitative approaches of discourse analysis that may reveal (often habitual) relations of power embedded in the form as well as the content of discourse (e.g., Ahlemeyer 1997) and associated pathologies of communication in human systems (e.g., Scott 1997).

BEING GLOBAL

Being global means being concerned for the whole planet—what is happening? What may happen? Epistemologically what does it mean to ask such questions? What answers might we expect?

There are two key inter-related issues:
(i) sustainable development (largely a set of first-order question about system measurement and performance);
(ii) maintaining and improving the right of actors to interact—mainly second-order concerns with "human rights", "democracy", and "justice"

Many commentators insist (i) is meaningless without (ii). Here I distinguish them for purposes of discussion. For (i) there is a logic that says: "We should be humble as part of a larger whole that is unfolding despite our actions", by, for example, paying attention to Barry Commoner's "four laws of ecology" ("everything is connected to everything else; everything has to go somewhere; there's no such thing as a free lunch; nature knows best").

Complex systems may be modeled in a variety of ways. We may "locally" foresee the consequences of negative and positive feedbacks on a particular subsystem's variables (monetary markets, global warming, population levels, levels of poverty and literacy) but we need to improve and integrate our models so they are more global in scope and do include

second-order effects of "agents'" actions, as in the economic modeling of Brian Arthur and John Holland, where account is taken of the fact that 98% of all financial transactions are speculations by agents about other agents' behaviors.

For (ii), there is a logic that says "non-democracies" are "social cancers" and that "justice" should be universal and be suitably empowered, together with checks and balances to reduce the risk of the imposition of totalitarian regimes.

"The right of actors" to interact implies that access to education and information should be universal; to participate fully members of a society need to be empowered (Pask 1990).

There is a need for the continuous critique of institutions (political, business, educational), a continuous "revolution in the revolution"—not so much to discover new wisdom but perhaps to ensure the light of existing wisdom (Cybernetics and before: Confucius, Buddha, Christ, Marx) is maintained and allowed to bear fruit (Scott 1999a; Birrer 1999).

Although I am arguing for a consensus view, there is scope for "agreement to disagree". I am referring to disagreements about certain "undecideables" (von Foerster 1993) having to do with life, death, time and eternity, good and evil. I argue it is possible for us to tackle global issues holistically, despite such disagreements.

BEING HOLISTIC AND GLOBAL

With respect to the need to be both holistic and global, Luhmann (1989) very clearly warns of two dangers:
(i) failure to "resonate" with the ecosystem (not being global enough in our concerns);
(ii) too much resonance between social systems (not being holistic enough to dampen unfruitful noise and "excitement").

Examples of (i) are many: being parochial with respect to one's own ecological niche; focusing on one issue (e.g., "global warming" or "poverty") but not taking cognizance of related issues (e.g., "opportunities for education" or "political freedoms").

Examples of (ii) are also many: the promotion of one scientific discipline over another; the promotion of one political ideology over another.

There is then an open invitation for all of us to be less parochial and more global in our concerns and interests. There is a need to listen to other voices, with an honest heart and an open mind. However, holism is called for if we are not to be overwhelmed by noise and excitement.

As noted earlier, the phrase "being holistic" refers to the need for transdisciplinary tools and understandings that can facilitate effective interdisciplinary working. There are two problems to be addressed and for which this paper proposes solutions:

1. "being holistic" lacks meaning for an individual if the implied theoretical ideal lacks a praxis;
2. the concept lacks consensual meaning if the praxis is not in some sense one that sociocyberneticians, as actors, may agree to apply together, in concert.

The question arises, "What is that praxis?" (cf. Heidegger: "Perhaps there is a thinking which is more sober minded than the incessant frenzy of rationalization and the intoxicating quality of

cybernetics...a thinking outside of the rational and the irrational.…The task of thinking would then be the surrender of previous thinking to the determination of the matter for thinking" (1978: 391-2)).

In systemic terms, actualizing holism requires a "nucleation", a cognitive/affective center around which the many facets and levels of our concerns may cohere and coalesce as insight and intuition (Capra 1982), as a pragmatically "true", coherent conceptual system or system of beliefs (Rescher 1973, 1977; Scott 1999b), as an organizationally closed "psychological (p-) individual" (Pask 1975, 1981) (see figure 1).

Why?

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┌─────────────────────────────┐
│ Metaphysical assumptions    │
│ Theoretical interpretations │
│ Conceptual systems          │
└─────────────────────────────┘
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How?

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┌──────────────────────────────────────────┐
│  ┌─────────────┐        ┌──────────────┐  │
│  │ Models      │ ─────▶ │ Application  │  │
│  │ Methods     │        └──────────────┘  │
│  │ Procedures  │                          │
│  └─────────────┘                          │
│         ▲                                 │
│         └──── Pragmatic correction ◀──────┤
└──────────────────────────────────────────┘
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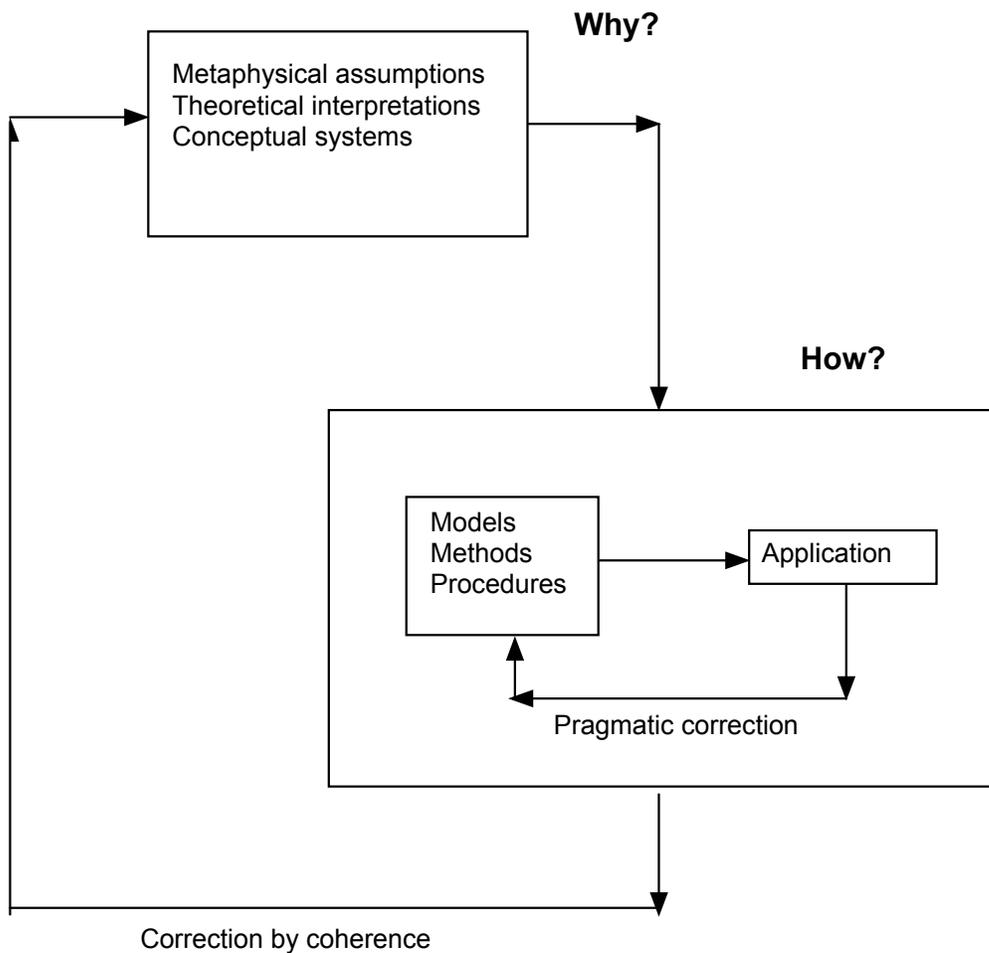
Correction by coherence

Figure 1. A "system of beliefs" (after Rescher)

Where is such a universal "center" to be found? I argue that it is precisely the perceived need for a holistic "centering" that is the "center" or, rather, may serve as such a center if we so choose. That is, as practitioners it is sufficient to intend to be holistic—and to share that intent—in order for ideas to be created fruitfully.

CONCLUDING COMMENTS

The theoretical position advanced in this paper should be acceptable to "postmodern skeptics" and "nihilists", as it allows for an ethically based choice of ontology, without the explicit imposition of a consensual morality (cf. Luhmann 1989, on the dangers of moral coding and the risk that "all ethical reflections may fail"). It should also be acceptable to those who, by faith, believe in a "beyond our understanding" eternity, in which "goodness, truth, and beauty" are one. Thus, as practitioner observers we may hope to move forward in unity of purpose, practicing "technologies of the self" (Foucault 1972; Giddens 1992) and "cognitive methodologies" (Scott 1983, 1996), whilst tolerant of our lack of uniformity with respect to "foundational", "transcendental", "metaphysical" assumptions.

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NEWSLETTER 13

1. LETTER FROM THE PRESIDENT

Dear Brisbane participants, dear members of RC 51,

A long period of sometimes hard work and intensive preparation has come to an end or rather, I should say, has resulted in a highlight in the history of RC 51 on Sociocybernetics: a week of social science at its best in Brisbane, with a lot of fascinating high quality papers, productive discussions, and meetings with good old friends as well as new colleagues that we had a chance of seeing for the first time in Brisbane. In some cases this happened after quite a period of e-mail exchanges. In other words, it was worthwhile and the work and efforts (and travel expenses) invested resulted in a rewarding experience after all.

Teamwork for a World Congress

This is, of course, in the first place my personal view, but not mine only. Many of our own participants but also people from outside RC51, including some of the ISA organizers, share this impression. This became possible to a large extent thanks to the excellent teamwork developed among our Board Members involved in the preparations, the members of RC 51 participating in our—this time three—review committees (for English, Spanish, and French sessions), the group preparing and conducting our tutorials on Sociocybernetics, as well as the participants preparing, presenting, and discussing their papers. It was outstanding, highly task-oriented, and yet carried out, by all those involved I dare say, in a spirit of enthusiasm and with a passion for science and for what science, in this case sociocybernetics, might be able to contribute to a better life for human kind.

A Big Thank You

Nonetheless there are several persons I want to thank individually. First of all Bernard Scott, our RC 51 Brisbane World Congress Coordinator, who did a great job. To Bernard we owe much respect and gratitude for the thousand little practical things he did for us, often tedious but indispensable for a successful RC 51 program in Brisbane. We also appreciate very much the care and involvement with which he tried to find solutions to the problems our participants brought to him. This he accomplished in spite of a change of jobs and change of e-mail system during the hot phase of preparations. Felix Geyer, one of our two Honorary Presidents, who has been at the heart of RC 51 since the congress in Bucharest, once more did not tire of granting us his very substantial support—this both in terms of his invaluable advice and judgments on scientific and organizational matters and in terms of the many e-mails tackling quite practical problems which he sent around the world for us. Fortunately Felix has

been recovering well from the health problems he encountered last year during our 3rd International Conference on Sociocybernetics in Leon, Mexico. For her readiness to take up challenges and find innovative solutions in organizing RC51 sessions, I want to thank very much our Vice-President Vessela Misheva. In addition to her involvement with all the aspects and complexities of organizing our World Congress sessions, Vessela prepared and chaired a very special round-table on "Cyberspace: Luhmannean or Habermasean?" with a group of selected discussants. The topic chosen was clearly appropriate to open up new perspectives for the scientific discourse on cyberspace. Essential contributions on the administrative and organizational side were provided by our Secretary, Richard E. Lee. We always could count on Richard when difficult issues were to be decided in the course of our preparations. Moreover, Richard organized a panel debate "Open the Social Sciences" with prominent sociologists. Although it was not within the formal framework of RC51, this session was highly pertinent to the concerns of RC51. Preparing such a diversity and large number of sessions successfully would not have been possible without adequate publicity during all stages of this process. In this respect we highly appreciate that Chaime Marcuello, our Webmaster, was always extremely helpful and responsive when new information had to be made available on our website quickly or when already published texts needed still "another little change".

Strategic Key Aspects of our Brisbane Program

Without entering into details, which you will find inside this Newsletter, I only want to emphasize here two components of our Brisbane program which seemed to be of particular relevance and important starting points, when seen from the outside of RC51 and by colleagues involved in running the ISA. This is first of all that we were one of the very few RCs offering full sessions both in French and in Spanish. The second was our tutorial program which was not a big success in terms of the number of participants (we even decided to cancel altogether two out of the five tutorials initially announced), but which nevertheless was considered as an important step and an important beginning in the context of a changing climate and orientation within the ISA. The few other RCs who tried similar activities in Brisbane apparently did not do any better than we did.

Institutional Breakthrough

All of this means that, apart from RC 51 being one of the largest RCs, also our scientific program and strategy is quite positively seen within the ISA. This is reflected by the fact that RC 51 has now a voice in the Executive Committee of the ISA. Our Board had asked me to be a candidate in the elections for the new ISA Executive Committee. This turned out to be successful, in particular, I believe, due to the overall achievements of RC 51, which are gradually being perceived by the ISA.

Towards a Vision of the Future of the Social Sciences

More important than this institutional progress, however, is in my view the fact that the Brisbane World Congress has produced a lot of new and highly promising ideas for our future scientific agenda. Organizational and institutional means are, after all, only tools towards scientific ends. The new scientific ideas and perspectives, however, will have to be worked out

carefully during the months and years to come. Our next International Conferences on Sociocybernetics will undoubtedly play an important role in this. At this moment I only want to point out that also the new structure proposed for our next Board reflects both our experience of practical work over the past four years and a new vision of our scientific agenda for the time to come.

To forge ahead, to be productive, and to shape the future of the social sciences in a sociocybernetic way, we do now have both the intellectual, scientific potential and the institutional access; however, it is far beyond the capacities of any board by itself. Instead, it will require a large, cooperative effort of all members of RC 51 and even beyond. I therefore invite you to join in this effort and to expand the teamwork which has developed around the Board to a substantially larger part of our membership.

It seems to me that is, after all, what we all hoped to accomplish in joining this group.

Bernd R. Hornung
President, ISA RC 51

2. MESSAGE FROM THE SECRETARY

The letter from our President, Bernd R. Hornung, the "News from the ISA" rubric that follows this note, and the reproduction of the program and abstracts documenting the participation of RC51 in the proceedings of the recent World Congress of Sociology, Brisbane, Australia all attest to the intellectual energy and organizational acumen that went into the preparations for this quadrennial event. Indeed, the World Congress has constituted the primary focus of RC51 activity during the period covered in this *Newsletter*. Given the many assertions of its success, I would like to present here some edited comments I have received from members who had the good fortune to attend this World Congress. I have maintained writers' confidentiality and have set aside those comments that entered into substantive detail to be taken into consideration by the organizers of our future conferences. So, although these are somewhat general, they seem to express a certain consensus. To wit:

"I thought the location in Brisbane was superb. The international aspect of the event combined with the sheer numbers of participants meant that wherever you were around Brisbane you'd bump into someone interesting to talk to. I even ended up sitting next to a conference delegate on the plane on the way home, over two weeks after the conference finished! As a newcomer to RC51, I liked the vibe immediately and felt quite comfortable pitching in straight away. I found a number of the papers very interesting. I also valued the broad range of papers presented applying a fairly consistent core theoretical approach (i.e. systems theory(/ies)) to a wide variety of applications. This is something that is badly lacking in learning technology, which is a new and largely practice-led area of work, which frustratingly lacks a strong theoretical basis. Personally I would like to see more contributions which go beyond introducing the idea of cybernetics and the suggestion that it is a useful way to look at this or that problem and actually get into the details a bit more. As socio-cybernetics

is at the core of the interests of the group, I thought that a greater level of knowledge and interest could have been assumed by some of the presenters."

"The RC51 booklet of abstracts would appear to be a distinctive feature of the group and very useful."

"I do think that some social meeting would help the group. For instance meeting for lunch before the first session and a dinner all together the third day and maybe a small reception with a little wine and snacks at the end of the RC51 session with a kind of summing up by session leaders and President. But planned in advance, so everybody knows. We might define some major focus points on which we want to have some roundtable discussions. Also in the different sessions it would be nice with a kind of summing up by the session leader. I love the feeling of moving forward on some basic problem areas. But we need more time in the presentations and discussions. Since we are so big how come that we did not have a plenum speech? Or why didn't we organize one session?"

"My impression of the conference itself is that it might be a necessary event and that we should use our session time to present our work but that we have a better opportunity in developing our ideas and deal with problems in our intermediate international conferences. Some of our sessions were extremely inhomogeneous and some of the contributions were—in my opinion—not state-of-the-art. However, I know that is impossible to avoid that some presenters contribute such more or less unacceptable material because the abstracts often give not enough information to decide about the real quality. I think the way we go (many know each other and are familiar with the work of other members of the RC and some others are located in fields relevant for sociocybernetics and can bring in experiences from there—in other words: continuity) will minimize the risk of having too many problematic contributions. So, again, it is a great pleasure to work in RC51 and I hope we will have exciting future meetings."

"Au total, notre expérience à Brisbane m'apparaît positive. Personnellement, je préfère que les sessions du soir permettent des échanges avec d'autres groupes et abordent des thèmes susceptibles d'intéresser un auditoire plus vaste que notre seul groupe RC51."

"I particularly enjoyed the conversation at dinner. It is intriguing to see the current diplomatic gamesmanship over an invasion of Iraq in the context of that discussion. I had a great time in Brisbane and am looking forward to the next meeting of RC51."

"In order to come to know what's going on in the wide-range subject area "sustainability", I attended paper presentations in several research committees, like RC 21 (Regional and Urban Development), 24 (Environment and Society), 40 (Sociology of Agriculture and Food)…, but nowhere I found such a togetherness and team spirit as existing in RC 51."

"The most outstanding thing about the conference was the RC51 'family' that although tightly knit, made newbies welcome and accepted.   While I found myself attending as many RC10 sessions and some RC33 sessions where I also presented a paper, it was the RC51 folk that were the most supportive tribe."

But now it is time to move on and preparations are already underway for upcoming RC51 venues. Thus, I would invite everyone to seriously consider attending our next annual meeting, the Fourth International Conference on Sociocybernetics, to be held 13-20 July (tentative) 2003 on the beautiful island of Corfu, Greece.

Richard E. Lee
Secretary, ISA RC51

3. FROM THE EDITORS:

While the new 2002-2006 RC51 board still has to be elected, Cor van Dijkum has already indicated his willingness to again act as Newsletter editor if elected, while Felix Geyer has indicated the contrary, although as Honorary President he remains prepared to help the board in many other ways. The present issue is still edited by Felix Geyer, as Cor van Dijkum is presently taking a well-deserved post-congress holiday in Australia.

4. NEWS FROM THE ISA

During the XVth World Congress of Sociology, held in Brisbane, Australia, from July 7 to July 13, several ISA Administrative Meetings were held and attended by the delegate and alternate of RC51, Bernd R. Hornung and Richard E. Lee. The most important points raised in these meetings will be presented in the following. For a better understanding, the organizational key features of the ISA will be outlined briefly.

Institutional Background
The ISA was originally founded as a union of national associations of sociology. Only later on the Research Committees were added, bringing together individual scientists interested in particular topics. At present, the more than fifty Research Committees of the ISA and their respective activities constitute a much larger part of the ISA than the national associations. This dual structure is represented in the organizational set-up of the ISA. A "Council of National Associations" consists of members elected by the respective national associations of sociology. A "Research Council" is composed of representatives of the Research Committees, usually the respective president or secretary. Both councils together form the "Assembly of Councils" which elects the president and the five vice-presidents of the ISA. President and vice-presidents together with sixteen more ISA officers assisting them during their four-year term constitute the "Executive Committee". Eight of the additional members are elected by the

Council of National Associations, the other eight by the Research Council. The daily work of the Executive Committee, including the cooperation with the Research Committees and the national associations, is supported by the ISA secretariat in Madrid.

Concerns of the Research Council
Major concerns expressed during the meetings of the Research Council largely correspond to the goals set forth by RC 51 for its own operation:
- to emphasize and develop in the very first place academic work, striving for high quality;
- to promote cooperation between different RCs, e.g. by organizing joint sessions during the World Congresses;
- to actively promote the use of Spanish and French, which are two of the three official languages of the ISA, the third one being English;
- to increase the ISA membership of the RCs, including by going outside the ISA, contacting other professional associations and institutions as well as individual colleagues. This implies bringing out more clearly and more visibly the ISA affiliation in all the activities of an RC.

ISA Statutes
The Assembly of Councils approved the modification of the ISA statutes as proposed by the committee charged with their revisions. The changes essentially amount to clarifications and improved formulations. The most important innovation is the creation of a new post of Vice-President for National Associations, paralleling the Vice-President for Research.

New ISA Executive Committee
The new ISA Executive Committee elected in Brisbane for the period 2002-2006 is composed as follows:

Elected by the Assembly of Councils:

President	Sztompka, Piotr, Poland
Vice-President Program	Sitas, Ari, South Africa
Vice-President Publications	McDaniel, Susan, Canada
Vice-President Research	Denis, Ann B., Canada
Vice-President Finance and Membership	Klandermans, Bert, Netherlands
Vice-President National Associations	Patel, Sujata, India

Elected by the Research Council:
1. Abreu, Alice R.P., Brazil, RC30
2. Evetts, Julia, United Kingdom, RC52
3. Fournier, Marcel, Canada, RC08
4. Hornung, Bernd R., Germany, RC51
5. Kalekin-Fishman, Devorah, Israel, RC36
6. Munakata, Tsunetsugu, Japan, RC49
7. Rodriguez Morato, Arturo, Spain, RC37

8. Thompson, Kenneth A., United Kingdom, RC16

Elected by the National Associations:
1. Alatas, Syed Farid, Singapore
2. Duran, Maria-Angeles, Spain
3. Fortuna, Carlos, Portugal
4. Germov, John, Australia
5. Kincaid, Douglas, USA
6. Lee, Su-Hoon, Korea
7. Sosa Elizaga, Raquel, Mexico
8. Wieviorka, Michel, France

The new President of the ISA, Piotr Sztompka, expressed as his major concern to strive for excellence within the ISA and to promote the development of a high quality sociology as a contribution to the world of the 21st century. To achieve this he intends to use a cooperative, team-oriented management style strongly based on the use of e-mail. Independence and responsibility of the Vice-Presidents in their respective fields of action are to be combined with close consultations among all those involved in running the ISA. This promises to be a way of managing the ISA well adapted to the challenges of the 21st century.

XVIth World Congress of Sociology, 2006, Durban, South Africa
The next World Congress will take place in Durban, South Africa, from July 23 until July 29, 2006. It will be co-sponsored by the South African Sociological Association, SASA. The latter will constitute the Local Organizing Committee together with the SANKOFA, Centre for the African Renaissance, and the African Renaissance Trust. The Congress will be organized at the International Convention Centre of Durban. It is intended in particular as an opportunity for African sociologists to participate in a worldwide forum on sociological issues. More information can be obtained by e-mail contacting tdchetty@pixie.udw.ac.za or sasa@lw.rau.ac.za. The website of SASA can be consulted at http://general.rau.ac.za/sasa/.

Board Elections of RCs
With regard to the elections of new boards, the ISA strongly recommends that RCs proceed in two steps. First, candidates for the new boards should be presented at the Business Meetings held during the World Congresses. During these meetings a preliminary opinion should be obtained about the candidates or a preliminary vote should be taken. Second, the definite elections should be carried out by mail ballot (not e-mail ballot!). The letters containing the votes should be sent directly to the ISA secretariat in Madrid, where the votes will be counted. This procedure is designed to ensure confidentiality and to prevent any irregularities in board elections.

Membership Fees
In a way, the ISA has now simplified a long and difficult discussion among RC 51 board members about whether or not to have RC membership fees. In order to take full advantage of

the privileges of an RC, and in particular the possibility of obtaining subsidies from the ISA, which have now been increased, an RC has to comply with a series of requirements, most of which are not new. New is, however, the requirement to have RC membership fees. This is the only requirement with which RC 51 does not yet comply. This issue was subsequently discussed both at a meeting of the available board members and at the RC 51 business meeting. There was consensus that RC 51 can no longer avoid collecting RC membership fees. The fees should, however, be kept to the minimum required by the ISA. How RC 51 will handle this issue in detail remains to be worked out by the new Board. As far as the ISA members are concerned, the ISA secretariat offers to collect the fees for the respective RCs together with the ISA membership fees.

5. BRISBANE PROGRAM AND ABSTRACTS

The following is a slightly revised version of the abstract booklet that was printed at the University of Utrecht, thanks to the arrangements made by Cor van Dijkum. It contains the overall program plus the short 250-word abstracts that were produced for the ISA, and it was handed out to participants in our sessions—including those dropping in on our sessions from other parts of the congress—as well as to members of the ISA Executive Committee and the ISA Research Council. As far as we know, we are the only RC that has produced such an abstract booklet, and its distribution was highly appreciated. In the present revised version a realistic overview of our Brisbane program is presented. It incorporates changes that had to be made on the spot, because some participants did not make it to Brisbane after all, or could not be there on the day their paper was programmed. Consequently, some authors presented their paper in a different session than originally anticipated, while those who ultimately could not make were deleted from the present and final version of the program.

PROGRAM

MONDAY, JULY 8, 2002

SESSION 1: SOCIETIES IN TRANSITION – 1.
MONDAY, JULY 8, 13.30-15.15
CONVENORS/CHAIRS: MATJAZ MULEJ AND VOJKO POTOCAN
1-1: Cestmir Halbich and B. Lacko: Trends in Sociocybernetics in Transitional Countries: Case Study Robotics
1-2: Timothy S. Kiessling a.o.: Global Ethics Programs and GGM : An Institutionalist Solution to the Existing Managerial Mindset
1-3: Matjaz Mulej a.o.: The Process of Creating an Economy and Society Supportive of Innovation in CEEC: A Comparative View of Slovenia

SESSION 2: MODELLING SOCIAL SYSTEMS: CONSTRUCTS & SIMULATIONS.
MONDAY, JULY 8, 15.30-17.15
CONVENOR/CHAIR: COR VAN DIJKUM
2-1: Francisco Parra-Luna: The Axiological Approach to the Measurement of the Quality of Universities
2-2: Cor van Dijkum and Hans Schroots: The Validity of Simulation to Understand Complex Social Phenomena
2-3: David Flynn, John Campbell & James Hay: The Emergence of Social Groups as Complex Systems
2-4: Karl-Heinz Simon: Social Ecology as a New Systemic Inquiry into Society-Environment Interrelationships - Modelling Approaches as a Common Ground

SESSION 3: LES ACQUIS DE LA SYSTÉMIQUE ET DE LA SOCIOCYBERNÉTIQUE DANS LE MONDE FRANCOPHONE.
MONDAY, JULY 8, 20.00-21.45
CONVENORS/CHAIRS: DIANE LAFLAMME AND BERND R. HORNUNG
3.1   Jean-Sébastien Guy: Système psychique et système social dans la théorie générale des systèmes de Niklas Luhmann
3-2: Diane Laflamme: Retour à la phénoménologie pour aborder la production du sens et l'interpénétration entre systèmes psychiques et systèmes sociaux
3.3   Evelyne Andreewsky & Danièle Bourcier: Pour une sociocybernétique du texte
3.4   Geneviève Koubi: Variabilité du sens des mots d'une culture à une autre

TUESDAY, JULY 9, 2002

SESSION 4: SUBJECT ORIENTED APPROACHES TO KNOWLEDGE AND LEARNING.
TUESDAY, JULY 9, 13.30-15.15
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4-2: George Kampis: Knowledge Without Knowing
4-3: Arne Kjellman: The Demise of Scientific Realism
4.4: Bernard Scott: Reflexivity Revisited: The Sociocybernetics of Belief, Meaning, Truth and Power

SESSION 5: ART AND SOCIOCYBERNETICS - BOURDIEU VERSUS LUHMANN.
TUESDAY, JULY 9, 15.30-17.15
CONVENOR/CHAIR: MARIO VIEIRA DE CARVALHO
5.1   Bridget Fowler: Mapping the Obituary: Notes Towards a Bourdieusian Interpretation.
5.2   Rudi Laermans: Bourdieu's Field Theory: A Systems Theoretical Re-reading
5-3   Erkki Sevänen: Luhmann versus Critical Sociology: A Contrast between an Anti-Humanistic and an Anthropocentric System Theory

SESSION 6: BUSINESS MEETING.
TUESDAY, JULY 9, 20.00-21.45
CHAIR: BERND R. HORNUNG

WEDNESDAY, JULY 10, 2002

SESSION 7: SYSTEMS THEORY AFTER NIKLAS LUHMANN – 1.
WEDNESDAY, JULY 10, 13.30-15.15
CONVENOR/CHAIR: RAF VANDERSTRAETEN
7-1: Jac Christis: Functional Analysis and Causal Explanation: Living Apart Together?
7-2: Klaus Dammann: Semantic Systems and the Functional Differentiation of Society - A Case Study on Terrorism as Warfare
7-3: David J. Connell: Community as 'Place in this World': A Second-Order Observation
7-4: Eva Buchinger: Extending Luhmann's Theory of Social Systems to Real World Problems: Technological Innovation and Societal Evolution

SESSION 8: SYSTEMS THEORY AFTER NIKLAS LUHMANN – 2.
WEDNESDAY, JULY 10, 15.30-17.15
CONVENOR: RAF VANDERSTRAETEN, CHAIR: EVA BUCHINGER
8-1: Raf Vanderstraeten: The Functional Differentiation of Modern Society
8-2: Boris Holzer: Beyond the Nation-State: Positive, Negative and Reflexive Integration in World Society
8-3: Egon Noe & Hugo Fjelsted Alrøe: Luhmann and Actor Network Theory Combined: Farm Enterprises as Self-organizing Systems
8-4: Michael Paetau: Space and Social Order: The Challenge of Computer Mediated Social Networks

SESSION 9: ROUNDTABLE SESSION: "CYBERSPACE: LUHMANNEAN OR HABERMASEAN?"
WEDNESDAY, JULY 10, 20.00-21.45
CONVENOR/CHAIR: VESSELA MISHEVA
Discussion on the basis of statements by Craig Calhoun (Department of Sociology, New York University, USA), Lauren Langman (Loyola University, Chicago, USA), David Lyon (Queen's University, Kingston, Ontario, Canada), and Michael Paetau (Fraunhofer Institute for Autonomous Intelligent Systems, Germany).

THURSDAY, JULY 11, 2002

SESSION 10: THE IMPACT OF INFORMATION AND COMMUNICATIONS TECHNOLOGY DEVELOPMENTS ON EDUCATIONAL INSTITUTIONS, BUSINESS ORGANIZATIONS AND COMMUNITIES – 1.
THURSDAY, JULY 11, 13.30-15.15
CONVENORS: BERNARD SCOTT (CHAIR) AND JAMES ANDERSON

10-1: James G. Anderson: Sociocybernetics and Changing Physician-Patient Relationships
10-2: Lucio Biggiero: COMMORG (Www.Commorg.Net): Organisational Consequences of E-Mail Introduction, Adoption and Diffusion
10-3: Sandy Britain a.o.: Modelling Organisational Factors Affecting the Development of E-Learning in a University Using a Cybernetics Approach
10-4: Alex Broom: Virtually Healthy: An Analysis of the Impact of the Internet on Patients' Experiences of Disease and Medical Treatment

SESSION 11: THE IMPACT OF INFORMATION AND COMMUNICATIONS TECHNOLOGY DEVELOPMENTS ON EDUCATIONAL INSTITUTIONS, BUSINESS ORGANIZATIONS AND COMMUNITIES – 2.
THURSDAY, JULY 11, 15.30-17.15
CONVENORS: BERNARD SCOTT AND JAMES ANDERSON (CHAIR)
11-1: Vessela Misheva: Towards a Theory of the Systems Medium
11-2: Suchismita Ray Paul and Bibekananda Paul: A Professional Conflict among Indian Female Medical Practitioners - A Fuzzy Theoretical Approach
11-3: Joy Murray: A Learning Organisation with 25,000 Members? A Six Year Study of Information and Communications Technology and   Institutional Change
11-4   Caterina Muzzi & Roberto Dandi: Organizations' Genre Repertoire Structuration as a Self-Organizing Process: The Case of an International Virtual Research Team

SESSION 12: UN ENFOQUE SOCIOCIBERNÉTICO AL LOS RETOS DEL SIGLO XXI.
THURSDAY, JULY 11, 20.00-21.45
CONVENORS/CHAIRS: DARIO MENANTEAU AND CHAIME MARCUELLO
12-1: Chaime Marcuello Servós: The G.I.D.I.D. Project: An Experience of E-Learning, ICT and Innovative Teaching at Zaragoza University
12-2: José Amozurrutia: Cibernética en hoja electrónica, para una cibernética de segundo orden
12-3: Emilio Nogales: Teoría de Sistemas y cientificidad en el análisis de la educación abierta

FRIDAY, JULY 12, 2002

SESSION 13: THE GLOBAL WORLD.
FRIDAY, JULY 12, 13.30-15.15
CHAIR: VESSELA MISHEVA
13-1: Bernd R. Hornung: Emergence - A Key Concept For Sociocybernetic Theory of Information Society
13-2: Felix Geyer: Powerlessness vs. Passionlessness: North "Meets" South at the WTC
13-3: Richard E. Lee: The "War on Terror": Braudelian Dust or Secular Sandstorm?
13-4: Shann Turbull: Grounding sociology in cybernetics

SESSION 14: AXIOLOGICAL SYSTEMS THEORY: ITS APPLICATIONS TO ORGANIZATIONS.
FRIDAY, JULY 12, 15.30-17.15
CONVENOR: FRANCISCO PARRA-LUNA, CHAIR: BERND R. HORNUNG

14-1: Brigitte Ömer: Sustainable Development in Communities by Value-Based Change Management

14-2: Dario Menanteau-Horta: Power Inequality, Globalization and 'Compassionate Conservatism': Old and New Challenges for the 21st Century

14-3: Philippos Nicolopoulos: The Ideology of Development and the Ecological Culture: Value Systems in Conflict in the Cases of Crete and Corfu and the Difficulties of the Decision-Making process

14-4 Takatoshi Imada: Complex Systems and Postmodernism: A New Perspective for Society in the 21st Century

SESSION 15: SOCIOCYBERNETICS AND SOCIAL TRANSFORMATIONS.
FRIDAY, JULY 12, 20.00-21.45
CONVENOR/CHAIR: KARL-FRANZ KALTENBORN

15-1: Arne Collen: The Review of Research with Human Participants as a Sociocybernetic System

15-2: Karl-Franz Kaltenborn: The Child's Knowledge, Competence and Agency in Decision Making in Family Transitions

15-3: Donald J. Main & Lindy Broadbent: Complex Industrial Relationships

15-4: David Drake: Understanding the Chinese Art of a Contract: Approach of Fuzzyology

ABSTRACTS

SESSION 1: SOCIETIES IN TRANSITION – 1
MONDAY, JULY 8, 2002, 13.30-15.15
CONVENORS/CHAIRS: MATJAZ MULEJ AND VOJKO POTOCAN

1-1: Trends in Sociocybernetics in Transitional Countries: Case Study Robotics

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The project was inspired by the 80th anniversary of Karel Čapek's drama R.U.R. (Rossum's Universal Robots). The term "robot", coined by Čapek, meant an artificial being similar to humans, able to perform human tasks. There are different problems in transitional countries, due to historical development. Robotization had been, in the Czech republic under the centrally planned economy, hyped by the authorities in 1980s. An intensive research was conducted at several locations, other than production of industrial robots. Other companies had to deploy those robots in numbers (often unreal) set by the center in production processes. The aim was to balance the number of operating robots to the level usual in western countries (the effectiveness and thrift of the solutions was ignored).

Immediately after 1989, robotization was in the center of attention of neither originating private companies (prior to 1989 there were none), nor the authorities. Preferred were issues connected with constructing the new country, new political system, deetatization and privatization of companies etc. Since there is no governmental industrial policy in Czechia, it cannot be expected that robotizational issues will interest any state institution.

1-2: Global Ethics Programs and GGM : An Institutionalist Solution to the Existing Managerial Mindset

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Ethical norms for business practices differ across countries by intensity and variety. Today's global/international managers must acquire a mindset that appreciates the ethical norms and cultures in order to gain an understanding of the environment in which the firm must operate (Al-Khatib, et. al., 1995). Several researchers have suggested formulation of ethical programs (or aspects therein) that are country specific based upon religion/morality (Rice, 1999) or based upon Hofstede's (1980) cultural determinants (Weaver, 2001). Thus, the realm of current organizational theory on global ethics has been subjected to validation that is relative to the social context of both the managers' home country and the traditions of the international management field (Peter and Olson, 1983)

An ethics program supported by managers with a GGM should be armed, not so much with specific rules and regulations, but an institutionalizing of the global firms' corporate morality throughout the organization to be applied globally. Thus, to legitimize a global -- institution wide -- ethics program, managers must develop a global group mindset (GGM), buy-in to the global ethics program itself, deliver transformational capabilities to their subordinates, and develop institutional (function/location spanners) and network (boundary spanners) governance mechanisms to uphold the ethical foundations of the program and organization.

1-3: The Process of Creating an Economy and Society Supportive of Innovation in CEEC: A Comparative View of Slovenia

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Key words: CEEC, innovation, routinistic ethics
Western countries grew rich because they were first to free entrepreneurship and make innovation necessary in competition a good century earlier than e.g. CEEC, who kept nurturing routinism and bureacracy until very recently, instead, and hardly can compete. Now, after centuries of a preindustrial guild economy, voters poorly understand their need for innovation, excellent quality, ability to trust, and creditwirthiness as preconditions for their own jobs and salaries, and their dependence on their own innovation. They prefer a slow development in 80%. Political parties balance between requirements of European Union and competitiveness on one hand, and collecting votes, on the other hand. In Slovenia, at least, there are lots of modern legislation supporting innovation, but its use is poorly supported. Entrepreneurs are poorly valued in public opinion. Etc. The especially underestimated issue are the organizational and managerial innovations that were essential in the West and could help a lot in development of the modern values seeing innovation, buyer's market, democracy, and entrepreneurship as the basis of the modern business, economy and life of a high quality level.

SESSION 2: MODELLING SOCIAL SYSTEMS: CONSTRUCTS & SIMULATIONS
MONDAY, JULY 8, 2002, 15.30-17.15
CONVENOR/CHAIR: COR VAN DIJKUM

2-1: The Axiological Approach to the Measurement of the Quality of Universities
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In this paper, consecrated to the assessment of universities, the concept of "university organization" is identified with a transforming system (T) which transmutes Inputs or "means" (X), into Outputs or "final ends" (Y), and the efficiency of which, is given by the basic expression $T=Y/X$. Hence, the inputs indicators can only be the use of the material, personal and financial structure making up the university organization (in fact, its total spending budget); and the outputs indicators the broad and complex system of values in which, in the case of universities, the salient value is KNOWLEDGE with its four classical functions of archive, critique, creation and transmission of knowledge itself. The operational procedure for working out "T" is based in four principles: 1) Dependency of universities from their stakeholders (students, professors, State, Society, etc.). 2) The relationship between NEEDS of the stakeholders and the production of VALUES to satisfy them. 3) The specific university relationships between VALUES and STAKEHOLDERS. 4) The operationalization of concepts through EMPIRICAL INDICATORS.

On the basis of this reflection, the aim is to deep into the possibilities of measuring the performance of universities, in relation to the concepts of "Efficiency" and "Overall Quality". For achieving this task, the use of empirical data through objective and subjective indicators,

will be the main method used. In this paper a selection of 67 indicators will be applied to the Universidad Complutense of Madrid in order to determine, first of all, the relative importance of indicators within standarized intervals between 0-100. The final result will be to suggest a kind of "Balanced Scorecard" for the university, in order to show the comparative efficiency of different departments and programs.

2-2: The Validity of Simulation to Understand Complex Social Phenomena

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Computer simulation seems to be a well-established scientific tool to generate knowledge about complex phenomena in our world. The sophistication of hard- and software made this success of computer simulation possible. Nevertheless, looking more close to this knowledge, one also sees confusion and divergence in simulation methods, methodologies and worldviews. As is the case in other fields of science different paradigms are used and there seem as many methods, methodologies and programming languages, as there are practices of simulation. When one questions the validity of simulation models the answers are quite unsatisfactory. How can one for example judge the validity of climate models? Is it possible to falsify those models? How is quantitative and qualitative validation balanced? Moreover, when one uses computer simulation to mimic and analyze social processes, with linear and non-linear feedback mechanism, how close can one come in understanding and handling those processes?

In this paper some methodological 'state of the art' answers to those elementary questions are given. That is done by: (1) updating the rationality idea of Popper and Lakatos into the framework of constructive realism; (2) from within this framework the (re)definition of (for simulation) important concepts such as system, feedback, social system, model, recursion, causal recursion,   linear model, non-linear model, complex, validation; (3) illustrated by examples of simulation of complex social phenomena from the domains of sociology and psychology; (4) referring to the way the science of simulation can function in an interdisciplinary framework to understand and handle complex social phenomena**.**

2-3:The Emergence of Social Groups as Complex Systems

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What happens when a group of ten to twenty people comes together with a facilitator for a relatively short time? To what extent can the process be explained with complexity theory? This paper describes how one such facilitator initially breaks down expectations of order, while establishing a multitude of interactions among group members, in order to move the group into the realm of chaos. The result is great uncertainty and a sense of disorder.

Later, through the establishment of goals and simple rules, the group begins to focus, uncertainty decreases, and the group moves back to just within the ordered phase, the so-called 'edge of chaos' realm. In this realm, the group can be classified as a complex system, orderly

enough to ensure stability, yet full of flexibility and surprise. Groups which emerge during this phase have great group solidarity, and heightened co-operation. It is as if the group resonates as one.

The idea of emergence is a key concept of complexity theory. It is our contention that the insights which emerge from the study of a relatively small system from both the outside and inside, can be applied to the transformation of other social systems between order and chaos and to the process of emergence into higher level systems. The paper should be of interest to those who wish to apply complexity theory to social systems, as well as to those who are interested in exploring the more theoretical nature of emergent properties in any complex system.

2-4: Social Ecology as a New Systemic Inquiry into Society-Environment Interrelationships - Modelling Approaches as a Common Ground

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Several contemporary German research programmes are dealing with society-environment-interactions in a very general sense. The central research question is: How is societal development interrelated with changes in the natural as well as in the social environment. Of special interest is this twofold approach: (1) Analysis of processes which occur in the domain of social subsystems (like economy, e.g. „globalisation"), and (2) the responses of natural systems (e.g. as the effects of land use changes).

In our contribution we will focus on the application of modelling techniques in this research area. We get closer to the problem of the missing social science models by a kind of „archaeological" approach: We look into the "history" of modelling contributions to social systems and describe benefits of system dynamics, multilevel systems theory, cellular automata approaches, agent-based modelling, and modelling techniques on the basis of artificial intelligence approaches and integrated modelling. In the centre of the evaluation of the approaches there are transformations and so-called "integration concepts" ("Brückenkonzepte").

Eventually, we finish by discussing a correlation between the integration concepts mentioned and the applicability of modelling techniques and by discussing the role of theory-building in order to achieve better models in social ecology.

SESSION 3: LES ACQUIS DE LA SYSTÉMIQUE ET DE LA SOCIOCYBERNÉTIQUE DANS LE MONDE FRANCOPHONE
MONDAY, JULY 8, 2002. 20.00-21.45
CONVENORS/CHAIRS: DIANE LAFLAMME AND BERND R. HORNUNG

3-1: Système psychique et système social dans la théorie générale des systèmes de Niklas Luhmann

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On a tort de dire que Niklas Luhmann fait disparaître l'intentionnalité des acteurs dans sa théorie. Si erreur il y a, c'est parce que la théorie de Luhmann est relue à la lumière de ses analyses. Ce faisant, on en vient à croire que ce qui n'apparaît pas dans les analyses ne doit pas non plus se retrouver dans la théorie. Or, il faut se rappeler la différence entre la théorie générale des systèmes de Luhmann et sa théorie des systèmes sociaux. Les analyses de Luhmann sont faites à partir de sa théorie des systèmes sociaux. Ce sont des analyses sociologiques.

À ce niveau, Luhmann prétend effectivement que l'intentionnalité des acteurs n'apparaît pas. Mais le fait qu'elle n'apparaisse pas *à ce niveau bien spécifique* ne nous autorise pas pour autant à affirmer que, pour Luhmann, l'intentionnalité des acteurs n'existe pas, ni qu'elle n'a aucun rôle à jouer dans la constitution des phénomènes sociaux, ni qu'elle n'a aucune place dans toute sa théorie. Un exercice d'éclaircissement est donc requis pour rendre compte de façon précise comment d'une part Luhmann reconnaît une pleine liberté aux individus en même temps qu'il cautionne la pérennité et l'autonomie du social et comment d'autre part Luhmann pense la nature du social comme incommensurable à celle des individus en même temps qu'il fait reposer l'émergence du social sur le comportement et l'attitude de ces mêmes individus.

3-2: Retour à la phénoménologie pour aborder la production du sens et l'interpénétration entre systèmes psychiques et systèmes sociaux

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Mots clés: Systèmes psychiques et sociaux, logique du tiers inclus, phénoménologie.

Le principal outil conceptuel que propose N. Luhmann dans sa théorie différentielle des systèmes observateurs (*differenztheoretisch*) est la différence entre système et environnement, un outil qui selon lui aurait une portée aussi prometteuse que les catégories d'Aristote! Avec Luhmann, on s'écarte de la logique d'objet : le système n'est pas un tout composé de parties, un lieu avec un intérieur et un extérieur. Si les systèmes psychiques individuels étaient des contenants, ils contiendraient des objets appelés pensées; si les systèmes sociaux (les interactions, les organisations, la société) étaient eux aussi des contenants, ils contiendraient des objets que l'on pourrait appeler individus, émetteurs ou récepteurs d'une communication. Or il n'en est rien : le système n'est lui-même qu'une différence, une distinction, dont les deux versants demeurent indissociables compte tenu de la nature même de l'opération d'observation.

Luhmann se sert de la distinction système-environnement pour observer la production du sens dans les systèmes psychiques et dans les systèmes sociaux. Il fait alors ouvertement appel à la phénoménologie husserlienne, où l'on trouve un semblable refus de décrire le psychisme en termes de rapport contenant-contenu, de faire de la conscience un dedans et du monde un dehors. Nous poursuivrons ce rapprochement avec la phénoménologie afin d'approfondir certains des concepts qu'utilise Luhmann, entre autres l'"auto–hétéro" référence et l'oscillation du système entre les deux valeurs d'un codage binaire avec exclusion du tiers, en nous demandant si l'intentionnalité pourrait servir de voie d'accès à des opérations avec

inclusion du tiers précédemment exclu.

3-3: Pour une sociocybernétique du texte

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Keywords: emergence, context, systems, word/text, individual/society

Certaines analogies entre relations **mot-texte,** d'une part, et **individu-société,** de l'autre, peuvent contribuer à l'intelligibilité de ces systèmes complexes que constituent *textes* et *sociétés*.

Individu-société : des *processus dynamiques complexes* (modèle *spéculaire,* Vullierme, 1989, autoréférence récursive, von Foerster, 1974 ...) "font *émerger* la société des comportements des individus, et font déterminer à ces derniers leur propre comportement sur la base du *modèle* qu'ils se forgent de leur contexte social".

Mot-texte : de manière analogue, un *processus dynamique complexe* fait émerger la signification du mot de son contexte. Un tel processus, appliqué récursivement, détermine (partiellement) l'émergence des interprétations du texte.

Texte-contexte : on retrouve (de manière un peu fractale) une dynamique contextuelle dans la genèse du texte. Celui-ci peut notamment comporter des indications pour son interprétation qui modifient les conditions mêmes de sa production. Ceci est particulièrement clair pour les textes juridiques. Nous présenterons en termes d'*émergence* la formation de la jurisprudence qui, loin d'être simplement une source du droit, constitue une véritable *société de textes* en auto-propagation circulaire.

Toutes ces émergences traduisent la complexité de ces *systèmes de systèmes* interdépendants. Selon Confucius ou Schrödinger, entre autres, les conceptions de l'homme et du langage sont liées, dans toutes les cultures. Il n'y a pas de société sans communication entre ses membres, donc sans langage - et aucune langue n'a jamais préexisté à une société. Cette indissociabilité *constitutive* invite à décloisonner les approches du langage et de la société, pour les aborder dans un cadre systémique - comme celui de la *Sociocybernétique.*

3-4: Variabilité du sens des mots d'une culture à une autre

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L'emploi du terme de "multiculturalisme" reflète un choix idéologique particulier qui oblige à repenser les cadres d'analyse des phénomènes sociaux : la transposition des concepts d'une tradition culturelle donnée à une autre induit des recompositions systémiques substantielles. Les champs dans lesquels s'insère ce concept invitent à problématiser l'interaction entre droit et société à partir de catégories juridiques "dissociées". Une remodélisation des relations sociales se constitue autour d'une notion d'appartenance qui mobilise le sentiment individuel et conduit à une forme d'accaparement groupal. Les translations des catégories de pensée ne sauraient être insérées dans certains systèmes politiques et juridiques sans remises en cause

substantielles. Deux séries d'observations peuvent alors être émises pour évaluer les variabilités de sens : la première concerne la différenciation entre multiculturalisme et pluriculturalisme obligeant des clarifications terminologiques ; la seconde induit une relecture du principe d'égalité qui est au coeur de la pensée républicaine française.

Lorsque la question est traitée sous l'angle du juridique, elle se déroule dans l'abstraction alors même que s'exprime la prétention des discours à retracer les réalités sociales ou encore à exposer un modèle de vécu. En comparant la logique des systèmes politiques et juridiques et leurs effets dans les structurations sociales, il apparaît que le "multiculturalisme" conduit à des catégorisations sociales discriminantes fondées sur des mécanismes de reconnaissance des "différences culturelles". Les notions de "différence" et de "culture" se révèlent souvent mal appréciées et doivent, sur le plan de la lecture francophone, inciter au développement d'une *conscience critique.*

SESSION 4: SUBJECT ORIENTED APPROACHES TO KNOWLEDGE AND LEARNING
TUESDAY, JULY 9, 2002, 13.30-15.15
CONVENOR/CHAIR: ARNE KJELLMAN

4-1: Luhmann Semioticized

Søren Brier, Associate Professor in. Philosophy of Science, Section for Learning and Interdisciplinary Methods, Dept. of Economics and Natural Resources, KVL (Royal Danish Agricultural University), Copenhagen, Denmark.
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The cybersemiotic approach functions by making synergies between the socio-communication systems theory of Luhmann with its basis in Spencer-Brown's logic of distinction, Peircian pragmatic semiotics, in the form of the new biosemiotics of Thomas Sebeok. The combination of systems theory and cybernetics was necessary to create a theory pertaining to structure, function and control. A theory of signification is necessary to understand how signs are created and get their meaning. Only Peirce's semiotics includes non-intentional signs, and as such, signs from the body and nature. Signification processes with the environment are seen as creating a signification sphere of meaningful objects in the livings system's cognitive apparatus. Peirce's semiotics needs the theories of self-organization, non-trivial systems, closure, autopoiesis, and structural couplings to explain the role of embodiment in conceptualization.

Cybersemiotics is thus a trans-scientific theoretical framework that places: 1. The languaging of reciprocal structural couplings at the level of signals and information. These processes are considered protosemiotic. 2. The instinctual, but motivated sign-games of living systems at the biological and psychological autopoiesis level of interpenetrations. 3. The language games of humans at a third level coinciding with Luhmann's socio-communication. Meaning is seen as coming from structural couplings with semiotic processes in body and psyche, their coupling to the environment, and between two individuals in the sharing of significations spheres that actualize mutual understanding.

4-2: Knowledge Without Knowing

George Kampis, Department of History and Philosophy of Science, Eötvös University, Budapest
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Knowledge, in the representational sense, is based on the process of knowing, by which the outside world is mapped onto a mental state. More importantly, knowledge itself is assumed to be such a mental state, or a property of such a mental state, and as a consequence, the relationship between knowledge and the external world is generally assumed to be that of reference, or the relation of a mental state to a state (or object, and so on) of the world.

By contrast, I consider knowledge differently, somewhat in a Wittgensteinian and Sellarsian perspective. Wittgenstein has showed us that words and the other products of the mind are based on social habits rather than inherent meaning. The result is twofold: we see the mind as social rather than individual, and we see that the mind lacks the tools which are needed for a Hobbesian or Cartesian internal combination of the meanings into thoughts. So how do we think, then? Well, perhaps thinking is something that just *happens*. Knowledge may be the result, rather than the basis of the processes that involve the activity of mind. This redraws our concept of mental entities. Wittgenstein calls them pictures; Sellars and Nyíri call them theoretical entities. Barsalou calls them perceptual symbols. I continue this line of thinking by investigating the nature of these mental entities as complex systems with causal effects on the internal construal of meaning.

4-3: The Demise of Scientific Realism

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The problem of consciousness cannot consistently be approached from the third person's perspective – neither can any other scientific problem. Even if partly successful the classical (realistic or Newtonian) scientific approach is bound to fail as the base of consistent science. The feedback paths of human brain is one reason and the ”inside” features of qualia another.

The claim is advanced that when we abandon the realist's doctrine we are able to establish a scientific theory of consciousness in the form of a *Subject-oriented Approach to Knowledge*. In one strike we then remove the bewildering Cartesian dualism, the troublesome chasm between the natural sciences and humanities and open the door for a science of consciousness.

The realist's doctrine assume the world and things to be both pre-given and observer-independent and the argument will be advanced here that this doctrine is not defensible any longer and the abandonment of this bewildering doctrine is an imperative necessity for a science of becoming. This demands a profound revision of the realistic conceptual framework in use today. The path we must enter upon is to admit the primacy of subjectivity and from this bright intuition find out that any living being construct its own private universes - PRIVERSES – ”inside” its mind. Not in isolation, however, but rather in social communication and adaptive coexistence and in this way we can restore the forlorn scientific objectivity in the form of an ”unseen” *model universe* (a set of models) based on a firmly established scientific consensus.

4-4: Reflexivity Revisited: The Sociocybernetics of Belief, Meaning, Truth and Power

Bernard Scott, Royal Military College of Science, Cranfield University, Shrivenham, Wiltshire SN6 8LA, United Kingdom
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That the social sciences are reflexive, that is, that they putatively explain the social scientist to himself, as an actor occupying roles within social institutions, is a well-established concept. In this paper, I draw upon the foundational cybernetic concepts of "process and product" in order to develop simple, clear, yet profound models of observing systems in interaction, with the aim of encouraging reflection on what is good practice in human communication. In the cybernetic spirit of synthesis, the models draw from a number of sources, in particular, the work of von Foerster on ethics and second order cybernetics, from Pask's cybernetic theory of conversations, from Rescher's work on conceptual coherence, from Pierce's pragmatic theory of meaning, from Suppe's work in the philosophy of science and from Bateson and Watzlawick's work on the pragmatics of human communication.

The models are used to discuss the sociocybernetics of belief, meaning, truth and power. "Belief", following Pask and Rescher, is modelled as a coherent, self-reproducing system of concepts. "Meaning", following Peirce, is modelled in terms of the pragmatic consequences of holding certain beliefs to be true. The concept of "truth" is modelled as "justified true belief", the classic ideal of the "objective sciences". "Power" is modelled as the pragmatic consequences of social interaction. Finally, the paper invites the members of the Sociocybernetics community to reflect on the reflexive nature of these models and to critically monitor and evaluate the quality of the communication within that community.

SESSION 5: ART AND SOCIOCYBERNETICS - BOURDIEU VERSUS LUHMANN
TUESDAY, JULY 9, 2002, 15.30-17.15
CONVENOR/CHAIR: MARIO VIEIRA DE CARVALHO

5-1: Mapping the Obituary: Notes Towards a Bourdieusian Interpretation.

Bridget Fowler, Dept. of Sociology and Anthropology, The University of Glasgow, Adam Smith Building, Bute Gardens, Glasgow G 12 8 RT, United Kingdom
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This paper will discuss the significance of the obituary in modern capitalist societies as a strand of collective memory. This paper explores the most meritocratic and least parochial editorial selections for the British obituary. It therefore focuses especially on the narratives of distinguished lives which appear in *The Guardian* and *The Independent* in the period 2000-2001. Points of comparison will be made with earlier obituaries in *The Times* for 1900, and, more briefly, 1948.

The contemporary *Guardian* and *Independent* obituary is viewed by both the current editors as a more open and democratised literary form. Indeed there is some evidence that anyone significant in making a mark in his or her field may acquire an obituary: the genre today includes such figures as the Czech runner, Emil Zatopek, the son of a carpenter, and the seamstress's daughter, Irene Thomas, the first woman to be Brain of Britain and Brain of Brains in the long-running radio quiz.

Nevertheless, it is argued here that the form should be studied in the light of certain underlying rules about distinction operating within the genre. Bourdieu's illuminating models of the changing reproductory strategies of the dominant class and the dominant gender are helpful in understanding the results, particularly in analysing the pivotal role of consecrated culture. The paper also reveals the existence of certain deep structures within today's obituaries which are not anticipated in the light of Bourdieu's work, especially the major significance of migration.

5-2: Bourdieu's Field Theory: A Systems Theoretical Re-reading

Rudi Laermans, Centre for the Sociology of Culture, Catholic University of Leuven, Van Evenstraat 2b, 3000 Leuven, Belgium
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We will start the paper with a brief elaboration of the most striking differences between Bourdieu's field approach and Luhmann's conceptualisation of the modern arts system. The main part shall deal with the possibility of a systems theoretical re-reading (or re-observation) of some of Bourdieu's insights. More particularly, we want to explore the following conceptual tracks.

First, the notion of symbolic capital can be re-described as a medium that acts as a secondary code in order to reduce complexity within a segmentary subsystem of the overall arts system. We will give particular attention to the possibility that on the level of artistic organisations, such as galleries or publishing houses, this secondary code greatly influences actual decision processes and self-observations.

Second, the notion of field may be retained to describe a particular network of artists and members of artistic organisations who interact with each other. This interaction system is primarily structured via general expectations on the one hand and an institutionalised semantics on the other hand. It is our thesis that Bourdieu's theory more than once 'reflects' the (expected) expectations within an artistic field, understood as an interaction system.

Third, one may argue that Luhmann's description of the art system in terms of 'compact communications' (works of art) which mobilise the conscious perception of forms in order to communicate, is too abstract. Bourdieu has a point here: the psychic system is structured by the medium of language and idiosyncratic experiences, but both are 'overdetermined' by the general social background of individuals.

5-3: Luhmann versus Critical Sociology: A Contrast between an Anti-Humanistic and an Anthropocentric System Theory

Erkki Sevänen, Professor of Literature, specializing in the Sociology of Literature,
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There exists in sociological system theory a contrast between an anti-humanistic (Niklas Luhmann) and a critical (Pierre Bourdieu, Jürgen Habermas) way of thinking. The former takes concepts from technical and natural sciences, while the latter leans on traditional Western Enlightenment culture and its democratic ideals. In Luhmann's theory, actual human beings do not belong to social systems: such systems are created by people, and people constantly

participate in them, but people's whole personalities and bodies are situated outside them. This anti-humanistic trait became even stronger in Luhmann's late production which is based on the concept of autopoiesis. Bourdieu and Habermas, in turn, have developed system theory on the basis of the concept of human action.

In the sociology of art Luhmann's thinking stands in contrast to Bourdieu's works and the spirit of the Frankfurt School (Habermas, Christa and Peter Bürger) as well as to Janet Wolff's feminism, Fredric Jameson's Marxism and Stuart Hall's and Lawrence Grossberg's view of cultural studies. These researchers have started from anthropocentric premises, and for them the study of art has meant an opportunity to exercise social criticism. Conversely, Luhmann tried to exclude questions of value from sociological investigation. My paper compares these two traditions with each other. It also deals with the question of the extent to which these ways of thinking are mutually exclusive. Moreover, it is important to clarify the ways in which the contemporary sociology of art can utilize these two modes of thinking when it aims to analyse the position of art in present-day society.

SESSION 6: BUSINESS MEETING
TUESDAY, JULY 9, 2002, 20.00-21.45
CHAIR: BERND R. HORNUNG

Agenda to be available in Brisbane.

SESSION 7: SYSTEMS THEORY AFTER NIKLAS LUHMANN - 1
WEDNESDAY, JULY 10, 2002, 13.30-15.15
CONVENOR/CHAIR: RAF VANDERSTRAETEN

7-1: Functional Analysis and Causal Explanation: Living Apart Together?
Jac Christis, Nijmegen School of Management, P.O. Box 9108, 6500 HK Nijmegen, The Netherlands
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The aim of the paper is to elucidate the relation between functional analysis and causal explanation in the system theory of Luhmann. Functional analyses should not be confused with causal explanations: functions of X are effects and so cannot be causes of the existence of X. Although functional analyses and causal explanations are different things, functional analyses both depend on causal explanations (functions are effects) and stimulate causal explanations (of side-effects). However, given his critique of the covering law model of explanation, it remains a mystery how causal relations can be established.

The aim of the paper will be to show that a solution is to be found in the replacement of an empiricist by a realist conception of causes and causal explanations. In this conception causal statements are not about regularities (about what always happens), but about capacities, that is, about what things or systems *with a structure* can do and not about what they always and in all circumstances will do. This means that the cooperation between functional analysis and causal explanation presupposes a realist instead of a Deductive-Nomological model of explanation and theory. So, as in his theory of knowledge, Luhmann's methodology is more

realist than it appears to be at first sight. See J. Christis (2001), Luhmann's theory of knowledge: beyond constructivism and realism? Soziale Systeme, 2.

7-2: Semantic Systems and the Functional Differentiation of Society - A Case Study on Terrorism as Warfare

Klaus Dammann, Fakultaet fuer Soziologie, Universitaet Bielefeld, Postfach 10 01 31, 33501 Bielefeld, Germany
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Theory: A difference of semantics and other structure has been introduced into sociology by Niklas Luhmann. Recently there has been some discussion (in English and German language) elaborating on possible interpretations of these concepts. Reflexive theory forms are part of semantic communication. For both: semantics in general and especially reflexive theory it has been proposed that system formation is possible, maybe discourse (Foucault) being translated into Luhmannian communication theory as a semantic system.

Hypotheses:
(1) Reflexive theory can be observed as a subsystem of functional systems.
(2) Communication on a particular topic related to function and identity of a functional system can be observed as participating in both: a reflexive subsystem of a functional system and a discourse system.

Methods: The topic of terrorism and its supposed or denied relation to warfare is chosen for a one-case-study. Replication logic, not sampling logic is also used to identify data sources for this discussion topic. Data are collected from communication described in print- and non-print-media.

Results: The first hypothesis seems to be supported by the data, the other one not (preliminary results). Implications are drawn for the question in what sense a claim may be formulated that reflexive theory should approach adequacy to the reality of functional differentiation (in this case: the differentiation of warfare from politics/administration and the economy).

7-3: Community as 'Place in this World': A Second-Order Observation

David J. Connell, PhD Candidate, Rural Studies, University of Guelph, Canada
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A theory of community based on second-order cybernetics offers a new perspective and new insights to the meaning of community. The limitations of available community theory have roots in treating community as a first-order *object* of study. Subsequently, community theory reveals only ontological descriptions. These theories help to describe human settlements, but offer little insight to the essential meaning of community. To move beyond first-order observations, scientists must see the distinction that gives rise to community as a form of social organisation. Hence, a second-order observation of community takes the form of a theory of social organisation that frames a theory of community. In this paper, Niklas Luhmann's theory of social systems is used for this purpose. Luhmann's theory of social differentiation helps to frame a debate about community's function.

The author extends Luhmann's theory by arguing that a human need to understand the

totality of society persists in the form of a need for belonging. Community, it will be argued, has acquired this function in western society as a result of functional differentiation. Luhmann's typology of social systems in conjunction with his theory of risk responds to several theoretical issues that arise from this line of inquiry. Also, a debate ensues as to whether community is a functional system or a symbolized medium of communication. The inquiry detailed in this paper represents an important contribution to the empirical analysis of Luhmann's work.

7-4: Extending Luhmann's Theory of Social Systems to Real World Problems: Technological Innovation and Societal Evolution
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Following Schumpeter's tradition, innovation studies have been dominated by economic concepts of explaining technological change. With the notion that innovation in modern societies is increasingly dependent on knowledge, other disciplines are asked to contribute to the understanding of knowledge creation, knowledge exchange and interactive learning in innovation processes. In sociology, a rather new approach is to use Luhmann's Theory of Social Systems to explain technological innovation.

Applying the Theory of Social Systems to technological innovation raises several prospects. First, the understanding of innovation processes as the result of the interaction within and among the three types of social systems - societal, organizational and interaction systems - enhances the precision of description and offers new perspectives on innovation networks. Second, analyzing the forces that are guiding innovation processes on basis of "societal systems" (instead of institutions) offers new opportunities to explain interaction within networks of innovators (self-reference, communication media). Third, the theory gives "knowledge" and "learning" a prominent role to explain societal and technological change. Last but not least, the theory can be linked to other evolutionary explanations of technological change (technological trajectories, selection mechanism).

The paper mainly focuses on two issues. It describes technological innovation on the basis of the three types of social systems applying Luhmann's terminology. On the basis of that conceptual framework, the paper explores on the interplay between technological change and societal evolution.

SESSION 8: SYSTEMS THEORY AFTER NIKLAS LUHMANN - 2
WEDNESDAY, JULY 10, 2002. 15.30-17.15
CONVENOR: RAF VANDERSTRAETEN, CHAIR: EVA BUCHINGER

8-1: The Functional Differentiation of Modern Society
Raf Vanderstraeten, Faculty of Sociology, University of Bielefeld (Germany)
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The *idée maîtresse* governing Luhmann's approach to the study of modern society was the concept of social differentiation. Luhmann focused especially on the way in which the system of society builds its primary subsystems. He argued that function, not rank, is the dominant

principle of system building. Modern society is differentiated into the political subsystem and its environment, the economic subsystem and its environment, the scientific subsystem and its environment, etc. Each of these subsystems establishes a specific, highly selective set of system/environment relations. Each accentuates the primacy of its own function. The idea of functional differentiation directs attention to the autonomy and self-organization of single function systems as well as to the centrifugal tendencies inherent in modern society.

In comparison with the 'founding fathers' of modern sociology, Luhmann deploys the concept of social differentiation in a unique way. In his constructivist view, function systems are differentiated by means of their modes of observing. Functional differentiation cannot be depicted in terms of 'division of labor' and the materialization of corresponding forms of 'organic solidarity' (Durkheim). Parsons overestimated the existence and necessity of shared value commitments in modern society. Modern society has become too complex for its unity to be guaranteed by common goals and norms. There is no core or fundamental division driving our world, and there is no privileged position from which a rational overall view can be developed. Social order is dependent on the self-organization of single function systems. The resulting picture is hat of a 'centerless society'.

8-2: Beyond the Nation-State: Positive, Negative and Reflexive Integration in World Society

Boris Holzer, Research Centre 'Reflexive Modernization' (University of Munich), Theresien Str. 37-39, 80333 Munich, Germany
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World society is a stateless society, marked by inequalities and differences. To some, the corresponding lack of governance and integration makes it necessary to jettison the concept of a global society altogether. Yet systems theory argues that normative integration is not the defining characteristic of society. Society is not necessarily "integrated" by virtue of values and norms, which are but one possible source of integration. In this paper; I discuss three modes of integration – positive, negative, and reflexive – and their role in world society. From this perspective, the perceived lack of integration in world society appears to signify a shift from a predominantly normative or "positive" mode of integration based on the nation-state toward non-normative modes originating from the interaction of a variety of social systems. Among the possible scenarios, I will highlight two alternative modes of integration: a "negative" one based on conflict and a "reflexive" one based on anticipation and mutual adjustment.

8-3: Luhmann and Actor Network Theory Combined: Farm Enterprises as Self-organizing Systems

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From a rural, sociological point of view no really satisfying social theories suggested have been able to grasp the complexity and special character of a farm entity. The contention of this paper is that a combination of Luhmann's theory of social systems and the Actor Network Theory of Latour, Callon, and Law offers a fruitful binocular perspective of a farm as a framework for understanding a farm as a self-organizing entity and for studying the social, economic, technical, and biological aspects. The two approaches build on two different ontologies and cannot be merged into one theory.

Luhmann's theory offers an approach to understand a farm as a self-organizing system, operating in meaning that has to produce and reproduce itself through demarcation from the surrounding world by selection of meaning. The meaning of the system is expressed through the goals, values and the logic of the farming processes. His theory, however, gets weak on studying the material's heterogeneous character of a farm as a mixture of biology, sociology, technology, and economy.

The Actor network theory offers an approach to focus on the heterogeneous network of interactions of human and non-human actors like knowledge, technology, money, farmland, animals, plants etc., and as to how these interactions both depend on the quality of the actors and the network context of interaction, but the theory is week when it comes to explaining the self-organizing character of a farm enterprise.

8-4: Space and Social Order: The Challenge of Computer Mediated Social Networks
Michael Paetau, Fraunhofer Institute for Autonomous Intelligent Systems, Schloss Birlinghoven, D-53754 Sankt Augustin, Germany
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In the current discussion on the increasing use of computer supported communication, it seems that society has reduplicated. Virtual economy, virtual organisations and virtual society are staying beside their real brothers and sisters. These observations are describing a particular form of social communication as a kind of society beside the society. The frontiers of the »old« and the »new« society are obviously marked: The communication inside the »cyberspace« (characterised by computer-networks) defines the »virtual society«. All other aspects of society staying outside, remaining in the so-called real world.

The paper argues against this demarcation between media and real world. The starting point will be a reformulation of the role, which space plays for the constitution of social order. Unlike the container metaphor predominant in the mainstream of sociological literature, a relational concept of space is used. Such an understanding of space, comparable to the one created in physics since Einstein, renounces a fixed system of reference from which the space could be observed. Space is always dependent on the observer's perspective. Such a concept we find in Luhmann's Theory of Social Systems. Although in his theory the term of space does not play an important role, it is important when looking for an answer to the question for social order in computer mediated social networks.

SESSION 9: ROUNDTABLE SESSION: "CYBERSPACE: LUHMANNEAN OR HABERMASEAN?"
WEDNESDAY, JULY 10, 2002, 20.00-21.45
CONVENOR/CHAIR: VESSELA MISHEVA, Institute of Media and Communication, Department of Information Science, and Institute of Sociology, Uppsala University, Sweden
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This occasion will gather together interested and important scholars for a lively and inspiring discussion of those sociologically significant aspects of Cyberspace that render it one of the currently most interesting fields in sociology. In particular, the discussion will be oriented towards the theoretical challenges which the new information, communication, and network-reality brings to the social world. Concepts to be discussed include globalization, glocalization, cyberactivism, integrating and alienating internetworked forces and movements, publicity, surveillance and privacy, and digital divides. Two possibilities will also be considered, namely, that Cyberspace either brings forward new arguments in support of the most prominent theories of modernity, such as those of Luhmann and Habermas, or alternatively generates a new theoretical discourse which renders them irrelevant and sentences them to oblivion. In order to properly address such matters, the discussion will show special interest in such more concrete questions as:

To what extent do the properties of Cyberspace fit the Habermasean model of a public sphere? To what extent can Cyberspace be viewed as a newly opened social domain that facilitates the formation of public opinion? How does the dramatic change in the conditions for producing both communications as well as communication patterns and means effect the theoretical presentation of World Society as a system comprised of communications?

Featured discussants will be Craig Calhoun (Department of Sociology, New York University, USA), Lauren Langman (Loyola University, Chicago, USA), David Lyon (Queen's University, Kingston, Ontario, Canada), and Michael Paetau (Fraunhofer Institute for Autonomous Intelligent Systems, Germany).

SESSION 10: THE IMPACT OF INFORMATION AND COMMUNICATIONS TECHNOLOGY (ICT) DEVELOPMENTS ON EDUCATIONAL INSTITUTIONS, BUSINESS ORGANIZATIONS AND COMMUNITIES – 1
THURSDAY, JULY 11, 2002, 13.30-15.15
CONVENORS: BERNARD SCOTT (CHAIR) AND JAMES ANDERSON

10-1: Sociocybernetics and Changing Physician-Patient Relationships
James G. Anderson, Professor of Medical Sociology, Co-Director Rural Center for AIDS/STD Prevention, Department of Sociology & Anthropology, 1365 Stone Hall, Purdue University, West Lafayette, IN 47907-1365, USA.
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The Internet is providing information and services that assist consumers to assume more responsibility for their own healthcare and decisions affecting them. While there is a growing trend toward incorporating patients' preferences into medical decision making, some

physicians feel threatened when patients confront them with information about alternative therapies they have gathered from the Internet. A challenge for the future is to facilitate appropriate patient responsibility for their own care by facilitating their ability to locate and interpret authoritative medical and health information while providing tools to protect patients against the risks of inappropriate information and self-diagnosis.

Also, there is evidence that in contrast to the public, physicians are more skeptical about the usefulness of the Internet. A recent survey by Forrester found that only 25 percent of the respondents thought that the Internet was useful in providing patient education. In addition, disputes over access to certain health-related information have begun to occur, for example, quality information about physicians in New York State who performed coronary artery bypass graft operations, costs of medical procedures, and information about malpractice awards and civil and licensing board actions against physicians.

One of the most important effects of the Internet will be to strengthen the patient's role in managing his/her own health. This development reflects a cultural change in healthcare. While the use of the Internet holds considerable promise for healthcare, it raises a host of social and ethical issues that will need to be addressed.

10-2: COMMORG (Www.Commorg.Net)**: Organisational Consequences of E-Mail Introduction, Adoption and Diffusion**
Lucio Biggiero, LUISS University, Viale Pola, 12, 00198 Rome, Italy.
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How do an organisation's structure and processes evolve following the introduction of email communications? Is it true that that enhances a sort of "democratisation" of decision making? Is FtF (face-to-face) actually replaced by email communication? In virtual organizations, can members' trust be built on pure email communication? To what extent the use of email communication depends on social (local) norms or values? To what extent does it depend on technology-use mediators? These are some of the questions that COMMORG project is researching. The project explores questions related to human-computer interactions, opposing to technological determinism, which suppose that a technology has intrinsic structural properties determining universal forms of adoption. On the contrary, according to social constructivism, situational factors select the actual usage of technology, among the many potentially defined by the supposed structural properties.

The project focuses four main topics: degree of email substitution/diffusion, trust/identity formation, emergence of genre repertoires of styles of communications, and participation in decision making. Analysis of email effects is based on a set of six explaining variables: task complexity, self organisation, social context, cultural diversity, technology use-mediators, and geographical distance. Further dimensions are brought to the research since three types of organisation (international teams, national research institutes, and corporate accounting departments) are analysed in four EU countries: Italy, Greece, Netherlands and the United Kingdom.

10-3: Modelling Organisational Factors Affecting the Development of E-Learning in a University Using a Cybernetics Approach

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The recent emergence of internet-enabled software tools to support eLearning has prompted many UK universities to begin to attempt to integrate such virtual learning environments (VLEs) into their teaching. It is generally recognised that to be effective in an institutional context, VLEs need to be joined-up to existing information and administration systems. In this paper we argue from a cybernetic perspective that in addition to the technical demands of this task, there are a wide variety of organisational, social and political factors associated with the way a university is structured, the dynamics of its internal operation and its recent history that present a significant risk of project failure if they are not given sufficient recognition and appropriate strategies for change put in place. These complex challenges can usefully be addressed from a cybernetic perpective.

The remainder of this paper describes an approach to modelling an instituition's socio-technical systems using a combination of the Viable Systems Model drawn from management cybernetics and action research techniques. A case study is presented of the use of this approach at a UK university on the verge of eLearning adoption. The methodology described was used to develop a rich cybernetic model of the university's systemic structure and operations from the perspectives of multiple stakeholders. Finally we reflect on the use this model to inform subsequent decision-making with regard to eLearning and the university's approach to organisational change. Specific attention is also given to the role of the research team themselves as agents of change.

10-4: Virtually Healthy: An Analysis of the Impact of the Internet on Patients' Experiences of Disease and Medical Treatment

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This paper will be a presentation of 'research in progress' focused on exploring the effects of the use of the Internet (for information and support) by Australian men with prostate cancer. In this paper I will present the initial findings of my doctoral research exploring how the Internet affects men's experiences of disease, and in particular, the impact of their Internet usage on encounters with medical professionals. This will involve an exploration of the complex effects and contradictory roles of the Internet as both a source of empowerment and social support, and as a medium that has an increasingly important role in the dissemination of biomedical knowledge.

This paper will focus on exploring the following questions: 1) How does access to information and support online affect men's experiences of prostate cancer? 2) What are the benefits and limitations of online support groups and information sources for men with prostate cancer? 3) What are the implications of 'Internet informed patients' for doctor-patient

interactions?

Discussion of these questions will be partnered with theoretical discussion around the 'nature' of online interaction: 1) What are the implications of the so-called 'characteristics' of the Internet environment (i.e. anonymous, fragmented, unregulated etc...) in terms of allowing men to talk about the complex issues surrounding prostate cancer? 2) Is the Internet contributing to the demystification of medical expertise - the deprofessionalisation of medicine? 3) Is the Internet, as some commentators suggest, an egalitarian social forum, free from the structural constraints and regulatory processes of the 'real world'?

SESSION 11: THE IMPACT OF ICT DEVELOPMENTS ON EDUCATIONAL INSTITUTIONS, BUSINESS ORGANIZATIONS AND COMMUNITIES – 2
THURSDAY, JULY 11, 2002, 15.30-17.15
CONVENORS: BERNARD SCOTT AND JAMES ANDERSON (CHAIR)

11-1: Towards a Theory of the Systems Medium
Vessela Misheva, Senior Lecturer in Media and Communication, Department of Sociology and Department of Information Science, Uppsala University, Uppsala, Sweden
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While the concept of system in sociology enjoys significant clarity, the concept of medium is underdeveloped and vague. Luhmann's systems theory is one of the first to attract attention to this concept. The discussion it suggests, however, has stumbled into the perplexing Kantian matter/form problem.

Drawing not from this metaphysical tradition, but rather from the philosophy of art, it here is suggested that the encountered theoretical difficulties are due to the fact that 'system' and 'medium' are two hypostases of one and the same thing. Insofar as their observation cannot be carried out from one and the same observation position, a theory that has both of them in its focus is quite improbable. The suggested definition of medium guides our inquiry beyond the present framework of systems theory. The medium thus is viewed not as a formless mass of elements all ready to serve any form, but rather as a particular pattern of links or a *constellation of materialized relations*.

This definition allows to extend the discussion about the system medium beyond the limits which Luhmann have defined for it. If systems theory is to survive the transition from modern to hipper-modern social worlds guided by the introduction of new ICT and interactive media it should develop a more realistic and attractive perspective on media which attaches to them importance, agency, and power.

11-2: A Professional Conflict among Indian Female Medical Practitioners - A Fuzzy Theoretical Approach
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In the present dynamic world it has became a matter of utmost importance to study the role of women in our society.   Professional women is comparatively a new emerging category in our society and is particularly true for Indian women. This emergence has led to a confusion regarding the roles of husband and wife. This has also caused a frustration in women due to the conflict between traditional feminine roles and the increasing reality of female employment outside the home. This paper provides a fuzzy-logical base to the representation, manipulation and utilisation of data. It also provides information regarding role management, role conflicts and variables which intensify or lessen those conflicts, together with a fuzzy-logical analysis.

Fuzzy logic, which was articulated by Lotfi Zadeh in 1965, may be defined as a precise approach to deal with the uncertainty which grows out of human life. Social science, particularly sociology, deals with relationships which are very much subjective and fluctuating. The social scientist has to make many drastic decisions about what can be expressed as "exact" knowledge. A convenient framework for dealing with such vague and imprecise knowledge is fuzzy logic and fuzzy set theory. For simplicity, we concentrate on five fuzzy variables, such as the age and health of respondents. We also we have fuzzified the input-output variables into three fuzzy regions. This fuzzy knowledge base is used to examine professional conflicts among Indian lady medical practitioners.

11-3: A Learning Organisation with 25,000 Members? A Six-Year Study of Information and Communications Technology and Institutional Change
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The *TILT* program was developed in 1995/6 to provide training in the classroom use of ICTs. Since then over 22,000 NSW teachers have undertaken *TILT*. Two research strands have operated since the program's inception. A survey and case studies were added later to provide insights into teacher change. Each semester participants evaluate the program and identify followup needs. Changes are made based on participant feedback; new programs are developed to meet identified needs. A base data survey provides details of participant pre-program access to, and use of, technology. Policy decisions are made using these data. A longitudinal study was piloted in 1998 and extended in 1999. Analysed against base data, it provided information on teacher change.

From macro to micro: two teacher case studies were written based on observation and interview over two years. They revealed that the teachers perceived as *information* quite different things; they used different metaphors to discuss learning; they identified different values in the program. They were each *in* a different program. *TILT* changed their classroom behaviour – but for different reasons. *TILT* changed their student learning opportunities but out of different teacher intentions.

Research has been one of the keys to success of the program. But what actually constitutes 'success' for the system, the school, the individual teacher and the student at the end of the line may be different and unpredictable things.

11-4: Organizations' Genre Repertoire Structuration as a Self-Organizing Process: The Case of an International Virtual Research Team

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Aim of this paper is to analyze the creation and evolution of organizational genre repertoire as a self-organizing process. Indeed social structuring of genre repertoire inside organizations can be viewed as a second order cybernetic phenomenon based on a recursive series of feed-back loops among organizational actors. This interactive process of structuration, both explicit and implicit, leads to the creation of a common set of shared meanings in which will reside the uniqueness of each organization or community, strongly embedded into the organizational context. The contextual embeddedness of social shared meanings implies that each sign, each metaphor, each socially constructed practice fully deploys its significance only within the context in which it is generated. In cybernetic terms, this is a reinforcement mechanism of the self-reference of social systems which may have relevant impacts on repertoire's structuration.

The paper also investigates how Computer-Mediated Communication can influence this process of recursive structuration and, consistently with Ashby's law of requisite variety, whether the evolution of genre repertoire is related to the degree of complexity that different actors associate to different tasks. The analysis will be carried out by studying the case of an international research team involved in a European project that principally collaborate through e-mail and other CMCTs (Computer-Mediated Communication Technologies) in order to accomplish different kind of tasks.

**SESSION 12: UN ENFOQUE SOCIOCIBERNÉTICO AL LOS RETOS DEL SIGLO XXI
THURSDAY, JULY 11, 2002, 20.00-21.45
CONVENORS/CHAIRS: DARIO MENANTEAU AND CHAIME MARCUELLO**

12-1: The G.I.D.I.D. Project: An Experience of E-Learning, ICT and Innovative Teaching at Zaragoza University

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Keywords: E-Learning; Information Communication Technologies (ICT); Impact of ICT
This paper presents the results of a research project intended to demonstrate teaching possibilities of ICT at the University level. Our starting point is exploratory, as we consider our teaching concerns based on common observation about our own limits as teachers, and the limits imposed by the organisation of our university system.

Traditional courses are in a room on the campus, and on a timetable, each of which is imposed by the bureaucracy based on constraints external to the personal needs and desires of

each student. ICT allows us to attempt a new situation, and to improve the traditional way. A teaching system partially supported by ICT could be better adapted to the students, based on individual rhythms of learning. These processes of teaching and learning based in ICT introduce new tools to improve traditional education.

We present, first, a synthesis of the main issues of the project, and its empirical development. Second, we then describe the particular applications of ICT and the process of creation of materials, interaction with users/students and other companions. Third, we offer a systemic evaluation of the results from two points of view: one, the team of researchers, and, two, the students/users opinion through a qualitative and also a quantitative approach using interviews and questionnaires.

In our conclusions, we develop a theoretical reflection about ICT and the teaching-learning process. We explore the path to obtaining the *know-how* of developing ICT based course material and conceptualising and understanding the transformations produced by ICT in our courses.

12-2: Cibernética en hoja electrónica, para una cibernética de segundo orden

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El presente artículo propone un modelo desarrollado en "hoja electrónica" (spreadsheet) para el análisis y evaluación cualitativa de proyectos que apoyan las actividades culturales y artísticas en México.

El modelo es aplicable a varias situaciones (actualmente está desarrollándose en un proyecto del Laboratorio de Comunicación Compleja de la Universidad Iberoamericana de México), y tiene la finalidad de hacer visibles los vínculos entre las personas y las actividades que desempeñan en un contexto complejo. Los aspectos teóricos del modelo consideran a las redes neuronales, el uso de lógica borrosa, la creación de una base de datos de conocimiento y representaciones configuracionales de los datos y resultados.

A partir de las personas o grupos que toman decisiones importantes en una institución, se conforma una red de nodos con la que se puede establecer una analogía con una red neuronal. El nivel de entrada a la red corresponde al conjunto de nodos que transforman y normalizan los valores (numéricos o no) de las variables a considerar en la toma de decisiones. Los nodos correspondientes a la capa oculta y de salida, evalúan los "pesos reales" y emiten recomendaciones cuando no son iguales a los "pesos deseables" o establecidos de antemano. Esta comparación invita a una "reflexión" que se reflejará en una actualización de los "pesos deseables" y/o de las recomendaciones para modificar los valores de entrada. El propósito final es disminuir la brecha entre lo que "desea" realizar la institución y lo que "puede" realizar, a expensas de una reflexión que lleva a transformar a la misma institución.

El propósito final es desarrollar un sistema inteligente para apoyar la toma de decisiones y políticas culturales de un equipo de trabajo.

12-3: Teoría de Sistemas y cientificidad en el análisis de la educación abierta

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1.- Luhmann piensa que es la teoría sociológica, mejor que cualquier ontología, ética o religión, la que puede proporcionar una perspectiva científica desde la que la sociedad actual se vea, se autodescriba como sistema social. La comunicación como elemento básico de ésta se describiría como triple selección de novedad informativa, versiones y reflexión crítica de lo que pasa.

2.- También la comunicación sería el elemento de análisis del sistema educativo. Que en el caso de la educación a distancia se presenta con un nivel más alto de densidad de enlaces en el flujo de sus interacciones, presenciales o no. Un salto cualitativo empíricamente comprobable que nos indica un fenómeno educativo nuevo y propio de la sociedad actual. La educación a distancia proporciona un ejemplo del paso de límites espaciales a estructuras temporales. Los límites del sistema son

analizables básicamente como fronteras, fases y procesos temporales. Y la evaluación, según trabajo o según capacidad de aprender/desaprender, también se realiza bajo la forma y la suma de duraciones y retrasos. Los datos de graduados, abandonos e intermitencias lo muestran empíricamente.

3.- Se proponen a la reflexión sociológica en esta comunicación estos fenómenos que la teoria de sistemas descubre en su sentido particular. Donde la mayor densidad de comunicación entre profesores y alumnos provoca nuevos problemas de contingencia. Entre otras cosas por el predominio en la comunicación de lo escrito y grabado.

SESSION 13: THE GLOBAL WORLD
FRIDAY, JULY 12, 2002, 13.30-15.15
CHAIR: VESSELA MISHEVA

13-1: Emergence - A Key Concept for Sociocybernetic Theory of Information Society

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Keywords: Emergence, Social Systems, Information Society, Sociological Theory, IT

Emergence is a term frequently used in interdisciplinary science and sociology, but usually ill defined. The paper clarifies the concept itself, relating it to basic notions like holism, structure, process, and function. Autopoiesis is considered a particular type of emergence. The concept of emergence is connected to traditional sociological concepts like Durkheim´s segmentary and functional division of labor and to social differentiation. Crucial is, that emergence does not only operate bottom-up but also top-down from emergent layers to lower levels.

Emergence is discussed as resulting from a critical mass or from recombinations of components. Thus it is a simple mechanism gaining complexity by combinatorics. This operates both at the level of matter/energy and the level of information.

Information is an emergent phenomenon at three major levels:

- Traditionally information processing occurs in brains and psychic systems.
- With writing such information could be externalized and objectified for storage, transportation, and hence communication. Such information is emergent if it becomes interpersonal and intersubjective, e.g. as culture. Culture implies externalization of information but remains itself a static system modified by processes in psychic systems.
- This is radically changed by modern information technology. Computers make information *processing*, not only storage, feasible outside the psychic system.
Social communications and actions evolving around computers and the Internet are characterized by extrapersonal information processing, shrinking communication time and space, and multiplication of information at practically no cost. The paper is to contribute to the development of adequate theoretical tools for a better sociocybernetic understanding of information society.

13-2: Powerlessness vs. Passionlessness: North "Meets" South at the WTC

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Developments leading to the attack on the WTC and the ensuing war on terrorism are discussed – a matter of "north meets south" rather than "east meets west". Passionlessness, as a new type of alienation characterizing both secularized information society and the dispassionate way the "war on terror" is waged, is contrasted with the certainly passionate and religion-driven extremism behind al-Qaeda and similar organizations. This extremism finds its roots a.o. in third world powerlessness, caused by the ongoing capitalist exploitation of a supposedly powerful and certainly exploitative "first world", a lack of education producing an overly simplistic image of a rapidly complexifying environment that cannot be explained anymore by religions from an agrarian era, and the economic deprivation which more than offsets the effects of development aid.

        This passion of the powerless, which also fueled revolutions (1789,1917) in earlier developmental stages of the western world but has now become extinct, can indeed be contrasted with the power of the passionless: just compare the faces of bin Laden and Rumsfeld! Many in the Western welfare states romantically idealize this passion, secretly admired and envied as something heroic lost in the race towards hypermodernity. However, such a passion correlates with powerlessness, lack of environment mastery, pre-industrial religions, and conditions of ignorance. In the 21st century, revolutionary passion and its correlates are on their way out – the price one has to pay for economic and technological progress in an admittedly colder but more interdependent world.

13-3: The "War on Terror": Braudelian Dust or Secular Sandstorm?

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Following the events of 11 September 2001, George W. Bush declares the attacks an "act of war" and makes clear the official interpretation: "we are a country awakened to danger and called to defend freedom"; he places the blame on "a collection of loosely affiliated terrorist

organizations known as al Qaeda ... [whose] goal is remaking the world" and its leader, Usama bin Laden.

In 1996, bin Laden had stated the motivations and implied the intentions of the "blessed awakening which is sweeping the world in general and the Islamic world in particular": "the people of Islam had suffered from aggression, iniquity and injustice imposed on them by the Zionist-Crusaders alliance and their collaborators; [... in] a clear conspiracy … the dispossessed people were even prevented from obtaining arms to defend themselves."

Here are two competing visions of the world. They do, however, seem to agree that the struggle will be protracted. For many, the most obvious analogy to the events of 9/11 appeared to be the attack on Pearl Harbor 7 December 1941. However, within what time frames do we measure victory and defeat? Are the events of 9/11 a speck of Fernand Braudel's inconsequential *"poussière"* or part of a secular sandstorm of fundamental, and unpredictable, change analogous to the transition from feudalism to capitalism? This paper suggests some answers to such questions.

13-4: Grounding sociology in cybernetics

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This paper grounds sociology in the natural science of cybernetics by introducing a framework of analysis described as Transaction Byte Analysis (TBA). No social relationship or organisation can exist without the transaction of information within and between individuals. All such transactions are subjected to physical limits that can be measured in bytes. These limits explain information overload and bounded rationality to provide criteria for investigating or designing social relationships, institutional arrangements or the processing of information, knowledge and wisdom. Cybernetic laws of requisite variety in communications, control and decision-making provide additional criteria for evaluating social systems and organisations.

TBA is used to explain the architecture of complexity found in nature and in the stakeholder firms located around the town of Mondragón in Spain. The Mondragón firms illustrate nested networks of "viable systems" described as "holons". These allow prodigious reduction in the transaction of bytes to facilitate the management of complexity. Holons, like individuals, possess contrary characteristics used by nature to efficiently create or manage complexity. Unlike many other organisational theories, TBA accepts that individuals can be either, or both, trusting and suspicious, cooperative and competitive and/or altruistic and selfish.

TBA is used to explain the advantages and disadvantages of the four modes of governance identified by sociologists. This provide a framework for subsuming economic theories of the firm and for comparing hierarchical firms with network firms or any other type of organisation. TBA grounds theories of the firm in the natural sciences to provide foundations for a "science of organisation".

SESSION 14: AXIOLOGICAL SYSTEMS THEORY: ITS APPLICATIONS TO ORGANIZATIONS
FRIDAY, JULY 12, 2002, 15.30-17.15
CONVENOR: FRANCISCO PARRA-LUNA, CHAIR: BERND R. HORNUNG

14-1: Sustainable Development in Communities by Value-Based Change Management

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The concept of sustainability integrates the subsystems Nature, Society and Economy to a total system in order to provide an adequate livelihood base and equitable access to resources for future generations. Because so many of the problems and solutions being addressed by this concept have their roots in local activities, the participation and cooperation of local authorities is a determining factor in fulfilling its objectives. Local authorities construct, operate and maintain economic, social and environmental infrastructure, oversee planning processes, establish local environmental policies and regulations and assist in implementing national and subnational environmental policies. As the level of governance closest to the people, they play a vital role in educating, mobilizing and responding to the public to promote sustainable development.

An effective starting basis to move change in a sustainable direction is a clear, shared vision of the desired future life in the community. It can be found in a two-tiered approach that combines (1) value formation through public discussion and consensus building and (2) integration of these values in all fields of duties and functions of a community. In Austria, this method was applied in several communities and proved useful for finding out extensive future developing targets to initiate a systemic sustainable development process. The necessity of value formation is evident because sustainability itself is a normative concept, a call to ethical responsibility. It focuses directly on the values that are a precondition to a just and sustainable world. Dealing with the idea of sustainability means therefore automatically dealing with ethics and values.

14-2: Power Inequality, Globalization and 'Compassionate Conservatism': Old and New Challenges for the 21st Century

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The capacity to influence the behavior of others regardless of their wishes is one of the most pervasive forces in social interactions. Power affects the functioning of all forms of social organization from small groups to social institutions, from national communities to international and global structures. In today's complex social systems with increased control, globalization, and conflicts, issues of wealth and poverty, democracy and oppression, peace and war are greatly connected to resources, privileges, and the use of power.

System's complexity, globalization, and power inequality are primary areas of concern for GST and constitute the main focus of this paper, which discusses the following questions:

- What are some conceptual and practical considerations offered by the field of sociocybernetics in the study of power?
- What are some of the consequences of power inequality and globalization trends? How does the neo-liberal ideology expressed by the slogan "Compassionate Conservatism" aim to justify the concentration of internal and international power?
- What type of systemic response can be expected toward power inequality and global domination? It is well accepted the notion that unequal distributions of resources, income, and power are deeply related to values, ideologies, and structural conditions of domination. Today, these elements appear to be a central force behind a growing international movement opposed to power inequality and unregulated global markets.

14-3: The Ideology of Development and the Ecological Culture: Value Systems in Conflict in the Cases of Crete and Corfu and the Difficulties of the Decision-Making Process

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Results are reported of quantitative and qualitative empirical field studies in Crete and Corfou, executed by two research groups

After World War II, the sociology of development was identified with the conscious structural transformation of society, resulting from changes in the leading secondary (industrial) section of the economy. For the people of a developing country like Greece this meant increase of their living standards at all cost, independent of the plans for rational structural change, (according to the industrial model) and without any perception of the supposed linear march of history. In the last three decades, the increase of Greece's national income was based more on the 3rd sector of the society (service production and para-economy) than on the 2nd (industrial) one.

In Crete and Corfu, income increased through mass tourism, although this touristic priority caused damaged the natural environment and contributed to a cultural alienation, especially in the touristic regions. However, it is not easy for the political system to find an effective balance between the principle of ecological protection, a value system not penetrated by the spirit of commercialisation, and popular demand for maintenance and increase of living standards. People compare themselves with the industrialized Western countries, but from the standpoint of consumption and not of production! The mechanisms of the decision-making process cannot easily surpass the ensuing "value conflict", though they should manage the whole situation reflexively and flexibly, trying to construct a different ideology and culture: a culture of "ecological protection" and of "qualitative life".

14-4: Complex Systems and Postmodernism: A New Perspective for Society in the 21st Century

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The objective of my presentation is to claim that the Hobbesian problem asking how the social

order is possible must be replaced with the problem of how the edge of chaos is established. Fluctuation, noise, disequilibrium and chaos have been noticed and emphasized in the last two decades as the major factors in the science of complexity. We may say that the current of the new scientific view of complex systems indicates the passing of a *Copernican Change* from the order theory to the chaos theory of the world in the twenty-first century.

The postmodernism succeeding the poststructuralism is a social version of the science of complexity and offers the viewpoint that foresees the self-organization of the coming new civilization. In the "edge of chaos" in modern civilization, the social system enters an excitation state and the "rhizomic (schizophrenic)" movement dedifferentiates the modern structural-functional system. Social roles and statuses formed with the functional requirement are dedifferentiated, and the actions not constrained by them become dominant. In addition, control and manipulation become invalidated and concepts such as control center, authorities and wholeness of system are refuted.

The increase of the arguments regarding complex system and postmodernism symbolically signals that modern civilization has reached the edge of chaos. Probably, a plan of the new civilization will come out from the chaos theory of the world. In the twenty-first century, the situation of society seems to have become heated by the generation of noise, fluctuation and chaos.

SESSION 15: SOCIOCYBERNETICS AND SOCIAL TRANSFORMATIONS
CONVENOR: KARL-FRANZ KALTENBORN

15-1: The Review of Research with Human Participants as a Sociocybernetic System
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Wherever humans are the participants in research, the projects that use them require prior scrutiny by a committee known in the United States as the Institutional Review Board. The board examines proposed research projects for their potential aversive impact of the research procedures on human participants. The board represents a kind of human activity system, and the process of review may be construed as a process of human systems inquiry. The author has served as the principal architect, designer, developer, and chair of the board at his institution.

This paper rests upon the author's perspective in cybernetics and systemics, and it consists of four principal parts. Each part will include factual details and select but illustrative case studies to illuminate the major points. The initial part is a description of the board for a graduate level distance education institution. The second part is an explanation of the multiple perspectives and interactions of the board as a sociocybernetic system. The third part is coverage of the range, variety, and frequency of ethical issues and practices that this board has encountered over the past three years. The concluding part is a discussion of some key contemporary questions and issues raised by this board on the ethics of research practices.

15-2: The Child's Knowledge, Competence and Agency in Decision Making in Family Transitions

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Keywords: child's knowledge, child's agency, custody, visiting access, decision making, divorce

The regulation of residence (respective custody) or visiting access of a child after his or her parents' divorce is a matter greatly affecting the child concerned. Therefore, it is necessary that "the views of the child [are] being given due weight in accordance with the age and maturity of the child" for these decisions (United Nations Convention on the Rights of the Child, 1989). In this paper, based on scientific literature and results from the author's own longitudinal study about children growing up with family transitions, the role of children's knowledge and competence in decision making about custody or visiting issues after their parents' separation or divorce is explored. Thereby the child's competence is not considered just as a skill of the child but rather as a way of relating the child's personal resources to the familial, social, and legal context. Consequently, the paper argues for applying (1) a systemic approach in studying the child's knowledge and competence to participate in decision making concerning his or her own life and (2) to enable the child by appropriate means to act accordingly.

15-3: Complex Industrial Relationships

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Industries, like organizations are comprised of interactions and relationships. When viewing these relationships from a complexity science perspective, one sees that the industry web is made up of several organizations, all with their own complex web of relationships that move within a multitude of attractors on several fractal scales.

This paper wishes to explore these ideas in the context of the complex, multi-layered and multi-faceted web of relationships within the sugar industry of South Africa. This paper will focus on bringing the ideas and concepts to a context of understanding the relationships, and the importance of systemic relationships within the agricultural community within the sugar industry of South Africa, in order to explore how these might bring about a new view to understanding society by inquiring into this microcosm.

Through this inquiry, we hope to learn more about a way forward for leadership and co-evolution in an ever-increasing complex economy that is fraught with immense diversity, both in culture and value systems.

In a linear paradigmatic view, the issues that South Africa faces would seem incredibly complicated. When viewed through the epistemological ideas and language of the New Sciences, the view changes to see the complex adaptive system with all its emergent and self-

organising capabilities that are inherent in such systems. The approaches to leadership, when faced with this view, will be very different to those taken by the hierarchical monoliths that are fighting to maintain their control.

15-4: Understanding the Chinese Art of a Contract: Approach of Fuzzyology
David Drake, White Terrace B, 2-32-2 Okusawa, Setaguya-Ku, Tokyo 158-0083, Japan
E-mail: drake@yha.att.ne.jp
This paper is attempting to explore the Overseas Chinese way of making contracts, using a Western perspective. We - Western business people working in Asia - have attempted to understand and work within the Overseas Chinese legal framework and also conduct trade across borders.

The lingua franca of the business world today is English and with that, the standard for legal contracts has its origins in the ancient Roman code. One exception to this is the cross boarder trade of the Overseas Chinese. What we now commonly refer today as the "Overseas Chinese" had its genesis with the Opium Wars. What ensued were the deaths of nearly 62,000,000 people and a massive Chinese Diaspora.

Westerners moving into Asia's markets are sometimes at odds about how to operate. The Overseas Chinese feel similar distrust and confusion moving into the Western markets. The main competitive edge in the Fareast being an information black hole. He who controls the information controls the market. The essentially fuzzy aspects that are imbedded deep within the Overseas Chinese culture assist them in transcending these barriers more easily.

The Overseas Chinese agreements are very often done on a handshake--and if written-- the content is very vague. It is understood by both parties that the fitness landscape is not fixed and does fluctuate and that one's agreements shift and change in accordance with the environment in which the agreement is operating.

6. PUBLICATIONS

A collection of papers delivered in various RC51 venues has been published as a Monographic section entitled *Directions in Sociocybernetics*, edited by Richard E. Lee, in the *International Review of Sociology*, Volume 12, Number 2, July 2002, 187-342. The contents are as follows:

DIRECTIONS IN SOCIOCYBERNETICS

Richard E. Lee, Guest Editor

1. Sociocybernetic Approaches for a Changing World: An Introduction
   Richard E. Lee
2. Sociocybernetics: Going beyond the Logic of the Social Sciences
   Cor van Dijkum and *Janneke van Mens-Verhulst*
3. Autopoietic Systems and Their Poietic Counterparts
   Vessela Misheva

4.   The Subject-Oriented Approach to Knowledge and the Role of Human Consciousness
            Arne Kjellman
5.   Conversational Heuristic as a Reflexive Method for Feminist Research
            Capitolina Díaz
6.   A Design for the Recursive Construction of Learning Communities
            Bernard Scott
7.   Minimal Conceptual Modelling (MINCOMOD): From Theory of Society to IT-Systems in Hospitals
            Bernd R. Hornung
8.   Non-Profit Entities and Social Efficiency: A Sociocybernetic Approach to Social Efficiency and its Measurement
            Chaime Marcuello Servós
9.   (Un)managing the Butterfly: Co-Sustainment and the Grammar of Self
            John Wood
10.   Globalization Is Not the Tyranny of the Market
            Stephen Schecter
11.   Globalization and Development: Challenges and Opportunities for Sociocybernetics
            Darío Menanteau-Horta
12.   Imagining the Future: Constructing Social Knowledge after "Complexity Studies"
            Richard E. Lee

7. UPCOMING CONFERENCES

2002 IEEE International Conference on Systems, Man and Cybernetics: "Bridging the Digital Divide – Cyber-development, Human Progress, Peace and Prosperity", October 6-9, 2002, Hammamet, Tunisia. Further information: Khaled.mesghouni@ec-lille.fr.

ISSC International Conference on Social Science and Social Policy. Organized by the International Social Science Council in cooperation with UNESCO, Vienna, December 9-11, 2002. For more information and (free) registration, please contact: Leszek A. Kosinski, Secretary-General, International Social Science Council, Maison de l'UNESCO, 1, rue Miollis, 75732 Paris Cedex 15, France. Tel. +33 1 45 68 25 58. Fax. +33 1 45 66 76 03. E-mail: issclak@unesco.org. URL: http://www.unesco.org/ngo/issc. There will be plenaries on the following subjects: 1) Synergies in the Social Sciences; 2) Advances in social and behavioural science disciplines; 3) Utilization of the social sciences and expectations of decision-makers and scholars; 4) International Cooperation in the Social Sciences

Association of American Geographers Annual Meeting, March 4-8, 2003, New Orleans, LA, USA, with a special session on Geographical Perspectives on Complexity Theory and Complex Systems. September 10, 2002: Expression of intent. Contact Joe Messina (jpm@msu.edu) by this date if you are interested in being in this session. Also feel free to contact   Tom   Crawford   (tcrawfor@gettysburg.edu)   or   Steven   Manson

(sm@stevenmanson.com) if you have other questions. September 20, 2002: AAG registration. The AAG has an on-line abstract submission system accessible via www.aag.org.

47th Annual Conference 2003 of the International Society for the Systems Sciences (ISSS). Theme: "Conscious Evolution of Humanity: Using Systems Thinking To Construct *Agoras* of The Global Village". Heraklion, Greece, July 7-11, 2003. More detailed information: www.ISSS.org. An effort is being made at the moment to enable participants – also from RC51! – to participate in our own Fourth International Conference on Sociocybernetics by having it the following week (jJuly 13-20, 2003) in Corfu, Greece. The conference objectives are:
1) To work towards making ISSS a living model of a Society capable of appreciating and practicing "conscious evolution;"
2) To explore and identify the role of systems thinking in the context of the emerging phenomenon of globalization;
3) To identify action steps in the pathway of constructing the agoras of the global village;
4) To enhance the praxis of boundary-spanning dialogue across disciplines and civilizations.

RC51's Fourth International Conference on Sociocybernetics. Corfu, Greece, July 13-20, 2003 (still tentative dates). Our own RC51 conferences have become known in the meantime for being held in extremely agreeable and restful environments. Our first conference was also in Greece (Kolimbari, Crete, 1999), the second one in the Spanish Pyrenees (Panticosa, 2000), the third one high up in Mexico (Leon, 2001). We hope that many of you will participate in this fourth conference, especially since it will offer you the unique opportunity to also participate in the ISSS annual meeting in Heraklion, Crete. There is a small caveat, as the dates have not been fixed yet definitively, but we will do our utmost to keep to these dates. Our board member and local organizer, Philip Nicolopoulos, has recently been doing research in Corfu, and has developed excellent relations with the local authorities. We therefore hope to be able soon to give you more details.

SIMSOC VI: Theoretical and Empirical Foundations for Agent Architectures,
September 19-21, 2003, Groningen, The Netherlands. Extended abstracts of about one page to be submitted before April 1, 2003 in plain text to maajanss@indiana.edu. Decisions about acceptance will be announced by May 15, 2003. A full version of the paper should be submitted by September 1, 2003.
Site address: http://www.bdk.rug.nl/simsocvi/

International Conference on Population Ageing and Health: Modelling Our Future, 8-12 December 2003, Canberra, Australia. Sponsored by: NATSEM, University of Canberra, The Australian Bureau of Statistics, The Applied Research and Analysis Directorate, Health Canada, and Canada Customs and Revenue Agency and Statistics Canada. The primary focus of the conference is microsimulation models and their applications. Short 200-word abstracts to: hotline@natsem.canberra.edu.au.

It is with sorrow that we note the passing of

STAFFORD BEER.

An obituary will appear in our next issue.

END OF NEWSLETTER 13