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# Globalization: understanding complexity

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**Abstract:** With the increasing availability of relatively cheap computer technology, and the development of sophisticated, nonlinear mathematical techniques, the ‘science’ of complexity emerged in the 1990s. The intellectual concern is the process by which systems composed of interdependent components change, and order is restored, while not tending to equilibrium or stability. Initially concerned with order in ‘natural’ processes (chemical reactions, biological evolution, etc.), recently there has been interest in the study of a complex, emerging order within the process of globalization. This paper reviews the debate, concluding that a process of democracy is the feedback mechanism for establishing order in a complex, globalized world.

**Key words:** complexity, democracy, globalization, localization, mobilization.

## I Introduction

Globalization is an enormously interactive social process, in which people, albeit often unwittingly, increasingly interrelate through complex international financial and investment institutions, extensive trade and production networks, sophisticated modes of communication, all within changing global cultural and ethical parameters.

Today . . . more people than ever are caught up in the process of cooperation and exchange involved in the production and distribution of every sort of commodity in a system that is global in scale . . . [breaking] down national and sectoral constraints on the circulation of commodities and capital, creating one interdependent market and production unit. (Petras and Veltmeyer, 2001: 156)

The ‘economic’ agenda is increasingly the ‘world’ agenda. Of the top 100 economic entities only 49 are nation states and 51 are corporations (General Motors is economically greater than Saudi Arabia). The largest 200 firms account for about a quarter of all measured economic activity; there are huge global financial flows – exchange transac-

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tions more than 60 times trade values, and 'derivative', financial speculative markets, were worth more than US\$64 trillion (US\$64 000 000 000 000) in 1996, over six times the combined value of the US and Japanese economies; etc.

Capital is mobile: investors can move funds around the globe in search of the highest economic return, with scant regard for national borders or national needs. A complex, global, social order is emergent, as nation states are integrated into the international economy, in spite of local social priorities being subordinated to global economic exigencies. This order is dynamic and unpredictable, though not chaotic; 'patterns' of relationships emerge, although there is no apparent trend towards a steady state or something which might be called 'equilibrium'.

How is such complexity to be understood?

In the 1990s, a 'science of complexity' developed, addressing the '... ancient idea that within life and the cosmos there might be fundamental ordering processes...' (Albrecht, 2001: 409). Complexity theory is oriented to understanding how interactive, dynamic systems, composed of highly interconnected yet relatively independent component parts, behave in an orderly fashion.

... 'complexity' ... refers to systems with many different parts which, by a rather mysterious process of self-organization, become ... ordered ... 'ordered complexity' ... (Cowan, 1994: 1, 2).

The components of such systems are arranged in structures at a number of levels; structures which are inherently dynamic and evolve through processes in which *patterns* of relationships between the component parts are established. Within this emergent 'ordered complexity' there is a '... *spontaneous* emergence of new structures and new forms of behaviour in open systems ...' (Capra, 1996: 85, emphasis added).

The evolution of 'organized complexity' is understood to be a consequence of *feedback loops*, by which the component parts receive information on the functioning of the system, information which is processed, with the behaviour of components adapting and evolving, establishing a new pattern of relationships between the parts. As systems adapt there are *emergent* properties, establishing order out of change and which appear to be nonpredictable; and yet ordered patterns of activity emerge.

Since Charles Darwin's theory of evolution by natural selection there has been interest in the emergence of order out of apparent spontaneous change. 'Evolution is not just "chance caught on the wing", it is not just a tinkering with the *ad hoc*, of bricolage, of contraption. It is emergent order honored and honed by selection' (Kauffman, 1993: 644). It is the identification of the dynamic of such selection processes which is the fundamental concern of complexity theorists.

It was not until the late 1920s, triggered by the debates around Heisenberg's 'Uncertainty Principle' (1927), relating to the velocity and position of objects, that there was interest in a *theory* of complexity (on the development of complexity theory, see Hayek, 1967b,c; Prigogine and Stengers, 1984; Nicholis and Prigogine, 1989; Waldrop, 1992).

As an approach to understanding emergent order, complexity theory became of significant concern in the 1970s with relatively cheap computing hardware and software, and the development of sophisticated, nonlinear, mathematical techniques, allowing scientists to model interconnectedness in complex networks of independent component parts. The combination of computer technology with complicated nonlinear

equations allowed for the numerical solution of complicated iterative processes; modelling components adapting to emerging circumstances in complex systems within an evolving global order.

The 'science of complexity'

... define[s] both the extent to which phenomenological descriptions of apparently real world systems actually resemble one another in fundamental ways and the extent to which our metaphors and abstract concepts of such systems ... resemble one another ... (Cowan, 1994: 3, 4).

Complexity theory is '... a process that represents the sharing of ideas, methods and experiences across a number of fields' (Trisoglio, 1995: 11, quoted Byrne, 2001: 1). Research into complexity has focused on the mathematical modelling of complex systems, seeking to identify possible outcomes and potential evolutionary pathways. The focus is upon *process*, in which system management becomes ever more complex, with system diversification as the links between component parts (quantitatively) increase and (qualitatively) change. This process of change is irreversible; time becomes a significant variable.

... irreversible not just in fact, but in principle, because, lacking inertial states to which they would tend to return when forces are removed [the trend towards equilibrium], the entities in the system are defined *historically* – in terms of the entire sequence of their interactions over a series of irreversible changes ... (Depew and Weber, 1988: 333, quoted in Albrecht, 2000: 410, emphasis added).

Complexity theory is the process of *becoming*. All systems operate within the parameters of a wider environment, which 'externalizes' aspects of their functionality. Higher levels of complexity are seen as reactions to changing external parameters prompting dynamic readjustment from *within* the system. However, Tainter (1988) emphasizes the cost of increasing complexity and the possible diminishing returns and resultant collapse of complex systems.

While specialists may claim to understand the 'micro' behaviour of the component parts, the challenge is to discover laws and regularities to facilitate prediction on a 'macro' scale: to discover the externally imposed pattern of order on the internal operation of systems – the (macro) nonequilibrium determinants of a (micro) order. Irreversible processes of complex organization have to be understood in evolutionary terms: they cannot be atomistically reduced to, or deduced from, their components. The whole is bigger than the sum of the parts, a whole which becomes ever more diversified, qualitatively evolving towards greater complexity. Equilibrium-based theories, which do not address qualitative change and where at least the direction of change is predictable, can only apply over relatively short periods of apparent stasis: such theories cannot account for development, emergence and process.

In complexity theory the world is modelled as a dynamic, nonlinear mathematical system, with no simple relation between 'cause' and 'effect'; small causes may have major effects.

Conventional approaches to the analysis of the economy and of society must be altered fundamentally if we are to make progress in understanding how the world operates ... The behaviour of the system as a whole can never be understood by mechanistically adding

together its component parts . . . the economy and society are more than the sum of the individuals who inhabit it . . . In the living, constantly changing economic and social worlds, the connection between the size of an event and the magnitude of its effects is no longer routine and mechanical. (Ormerod, 1998: x)

Models do not 'predict' so much as 'explain'.

The central contribution of dynamical systems theory to modern science is that exact solutions are not necessary for understanding a non-linear process . . . emphasis . . . is on . . . a geometric view of a process's structural elements . . . [and] what structures are generic . . . what behaviour types are typical across the spectrum of complex systems. (Mitchell *et al.*, 1994: 498)

There are of course limitations to what can be discovered through mathematical simulations of complex interactions, though there is a research agenda intended to make the complexity approach more generally accessible and relevant (see Colander, 2000b: 36).

The scope of research into the self-organization of complexity extends from 'natural' systems, most recently for instance – 'genomic medicine in the treatment of genetic diseases' (Phillips III, 2001), 'the design of clockless computer chips' (Tristram, 2001), 'the diversity of endoplasmic reticulum' (Blaustein and Golovina, 2001), 'the mathematics of complexity' (Hao and Shi, 2001), to addressing 'social' processes – 'changes amongst individuals in a medical system or the system at large' (Plsek and Greenhalgh, 2001), 'jazz and family physician practices' (Miller *et al.*, 2001), 'HIV patients understanding of antiretroviral treatment' (Stone *et al.*, 2001), 'educating medical personnel to manage an evolving, complex National Health Service' (Fraser and Greenhalgh, 2001); and on to include patterns of social, political and economic convergence and divergence which are 'symptomatic of the growing complexity of providing governance mechanisms in a globalized world' (Cerny, 1999b: 188, see also Cerny 1996 and 1999a).

Almost every discipline from physics and chemistry to neurobiology, economics, politics and history, has been forced to confront the issues raised by complexity theorists and explore the relevance of their ideas. (Gare, 2000: 327)

The intellectual project of this paper is to explore the relevance of complexity theory to an understanding of progress and development in an increasingly interdependent, integrated and complex 'globalized' world.

The purpose of nonlinear mathematical models of complex changing systems is to identify the feedback mechanisms by which order is restored to an evolving system. With regard to the analysis of emergent, complex global economic and social order, the emphasis on feedback mechanisms has to address the process by which individuals become cognizant of an evolving social order and vary their behaviour accordingly.

As individuals respond within national social systems to the changing global parameters of human existence, and if order is consequent on emergent complexity, then greater diversity is to be valued as a positive way in which order is created out of externally induced disorder. An overemphasis on equilibrium and stability will prejudice progress as systems are impeded from developing and adjusting to, and taking advantage of, an evolving external environment.

Where there is a dynamic social order, which is not tending towards a stable

equilibrium state, then progress is contingent upon addressing human social potentials which are immanent, not merely trusting to chance interaction between stochastic phenomena (independent individuals). To advance progress, development and social evolution within the context of self-organizing dynamic systems and to avoid the damaging imposition of assumed 'equilibrium states', the lesson from complexity theory is that stresses inherent within complex social systems will ultimately presage radical spontaneous reorganization, and heterogeneity will prevail over homogeneity.

In this context 'progress' implies fulfilling human potentials, the realization of which improves people's lives; and 'development' strategies are intended to change modes of social interaction, so as to facilitate progress and the fulfillment of individuals' evolving potentials. When applied to the analysis of progress and development, complexity theory has to explain why, even though large numbers of individuals interact within a changing global society, ordered patterns of social behaviour emerge and evolve. There is a *social* feedback mechanism, in which people learn, and *choose* how to modify their activity to better fulfil their potentials within social parameters and processes of governance which maintain social order. The analysis has to focus upon global social relationships between individuals: 'Relationships are the essence of the living world' (Capra, 1996: 169).

In particular . . .

'Globalization' impacts upon governance by altering the deeper structures which underlie governance processes and mechanisms, altering . . . socio-cultural structures, economic production and consumption, or political processes and institutions. (Cerny, 1999b: 188)

Any social 'feedback' mechanism must address processes by which individuals' behaviour and choices are constrained by, and respond to, wider social exigencies, adjusting to reflect broader social imperatives. Such an endeavour must be based on a conceptualization of human *motivation*. What is the *dynamic* of individuals' social activity? Why should people *change* their minds and their behaviour? How do we describe, explain and *understand* progress, social development, and individual choice? In particular, why should patterns of *social* behaviour be established from a myriad of *individuals'* choices?

The essence of a social feedback mechanism is the reconciliation of individuals' preferences (the realization of their potentials), with wider social imperatives which constrain what people are able (and want) to achieve. How does the individual interact, socially, with other individuals? In considering such behavioural relationships, do we assume a reductionist point of view and address social change from individuals' choices? Or should we begin with the social constraints on individuals' behaviour and adopt a holistic stance?

## II Reductionism: globalization and individual choice

Orthodox economists proceed from individuals' subjective choices. Society is believed to be nothing more than an aggregate of the individuals of which it is composed: individuals' potentials are 'pre-social' – an innate, biological endowment of 'tastes' and 'talents'. Individuals are essentially *independent* of each other and their activity is

dictated by the instinct for hedonistic expediency: individuals' subjective preferences on how to best 'maximize utility'. Progress is defined as each individual competitively realizing their own potentials: and development, the establishment of a market-based social order within which individuals are free to choose according to their particular preferences reflecting their unique tastes and talents (see Cole, 1995: chapter 3; Cole, 1999: chapters 3 and 11).

The social constraints on individual choice are other individuals' free choices. Development policy should then be directed towards reconciling the choices of a large number of independent individuals.

Adam Smith had a complex mechanism for reconciling a multitude of individuals' free choices: the 'invisible hand' of market forces. 'Smith . . . [observed] that economic growth had to be understood as a process involving increasingly *complex patterns* of specialization' (Rosenberg, 2000: 48, emphasis added). The analysis of the *Wealth of nations* (Smith, 1974) has been interpreted by neoclassical/subjective preference theory economists as specifying the mechanism by which *independent* individuals, intent on maximizing personal utility, can coordinate their distinct preferences. Individuals' potentials can only be fully realized through free market exchange. Since the 1870s such an approach to reconciling individuals' subjective preferences and social order has followed parallel trajectories: neoclassical theory and Austrian theory (see: Cole *et al.*, 1991: chapters 1–4; Cole, 1999: 35–39).

For neoclassical theorists, the ideal social environment in which independent individuals might realize their potentials (maximize utility) is the system of 'perfect competition'; a system which is in 'general equilibrium' and in which 'Pareto Optimality' applies. In such a state, given people's biological endowments, there can be no increase in individuals' utility (see Cole, 1999: 37–43). However, neoclassical theory cannot account for or analyse activity *out of equilibrium*: that there is a trend towards equilibrium is an 'article of faith'.

. . . mainstream [neoclassical] theory fails to explain how markets do in fact *come* to work. It explains in great detail the relationships that would prevail in markets that already work. (Kirzner, 1997: 13, emphasis in original)

On the other hand, distinctively, Austrian theorists understand markets to be complex systems of information exchange; learning processes in which individuals discover other individuals' preferences, highlighting the competitive opportunity for maximizing utility. Markets do not achieve general equilibrium or Pareto Optimality, rather they are '*. . . coordinative process[es] during which market participants become aware of mutually beneficial opportunities for trade . . .*' (Kirzner, 1997: 67, emphasis added).

From the theoretical vantage point of viewing individuals as being *independent* decision makers, globalization is evaluated as a natural extension of individuals' choices. 'The markets advantage is that it allows things to evolve in a *very human way*, through *free choices* of millions of individuals' (*Economist* 11 September 1999, emphasis added).

And globalization, the process of integrating billions of individuals, each uniquely endowed with tastes and talents, through global markets, can only serve to widen individuals' possible choices. 'Complex patterns of specialization' emerge, allowing individuals' to embrace as yet unfulfilled subjective preferences, in the maximization of



utility. Growing complexity reflects the growing numbers of individuals independently choosing to exchange within markets.

Globalization is to be encouraged.

... stimulating economic growth, making markets work better for the poor and building up their assets – is the key to reducing poverty ... *Future trade talks will require a forward-looking agenda for broader trade liberalization* [global free markets] ... (World Bank, 2000: 1, 5, emphasis in original).

Such a 'broader liberalizing agenda' is to be implemented by institutions such as the World Trade Organization, the International Monetary Fund, the World Bank, etc., controlling individuals' naturally competitive economic activity within the parameters of a legal system which mandates individuals to exchange freely. This is the social feedback mechanism which creates 'organized complexity'. Where 'good governance' is '... the rules that make markets work ...' (World Bank, 1992: 1).

### III Holism: globalization and social order

An alternative to considering individuals to be naturally 'independent', is to understand people to be *dependent* on society. Essentially, individuals are socialized to adapt to the needs of society. The basis of social existence is specialization within a technical division of labour, and social life has to be managed within these productive parameters: individuals are organized to cooperate within an institutionally based social structure. Free markets may be appropriate at very low levels of technological sophistication, implying a primitive technical division of labour, but with rising efficiency, technical development and dependence and an expanding technical division of labour, economic (and by implication social) life becomes ever more complex, evolving beyond the organizational parameters of anarchic market forces. Individuals are *not* 'free to choose' according to unique subjective preferences; people *depend* upon, and have to adapt to, increasingly complex technical exigencies of social existence.

It is an evolving technical division of labour which is the changing external parameter to which people have to adapt in an increasingly complex manner, and although individuals are still motivated to maximize personal 'utility', from their own 'micro' experience it is impossible for people to be aware of the wider (now global) social and technical opportunities for, and limitations to, individuals' choices. The wider 'macro' basis of technical cooperation has to be managed in the general interest for there to be efficiency, development and progress.

'If the economy is truly complex then individuals cannot rationally deal with every part of it ... People develop *institutions* to deal with the world. (Colander, 2000c: 13, emphasis added)

With technical development, the technical division of labour expands, individuals become ever more specialized and the economy more complex. New technical opportunities (the change in the environmental parameters of markets) and responsive patterns of behaviour within increasingly complex, adaptive systems evolve.



... a complex adaptive system acquires information about its environment... [identifies] regularities in that information, condensing those regularities into a... model, and... [acts] in the real world on the basis of that schema [model]. (Gell-Mann, 1994: 17)

Such complex social systems are managed institutionally according to schemas/models, or 'scientific paradigms', appropriate to the level of technical sophistication of social production.

Social structure becomes more differentiated and complex as people's mutual dependence deepens with technical change, and the institutional, structural management of social existence evolves. Society in general, and complexity in particular, is managed through institutions, which function to reconcile individuals' behaviour and activity to the general interest of society. An evolving, complex structure of the economy (and society) is the basis of 'institutional' economics (see Prasch, 2000): '... good economic policy is about "Getting the Institutions Right"' (Prasch, 2000: 222).

However, it is also argued that the sheer complexity of intra-institutional linkages necessitates decentralization for effective management.

Decentralization... means the construction of a world which is of a scale that can be grasped by the majority of people and is controlled by them within manageable organizational limits. (Atkinson, 1991: 124)

The concern of complexity theorists would then be to specify the linkages between, the 'path dependency' of an increasing number of institutions within (complex) civil society. Identifying the emerging, institutionally based, patterns of relationships between individuals, within complex social systems becomes the basis for social and economic policy appropriate to an expanding technical division of labour, emphasizing '... the role that norms and institutions play in moulding sound economic relationships...' (Prasch, 2000: 223).

With regard to globalization, the concern is with 'human' (social), as opposed to 'economic' (individual), development.

Human rights and human development share a common vision and a common purpose... The mark of all civilizations is the respect they accord to human dignity and freedom... The concepts and tools of human development provide a systematic assessment of economic and *institutional* constraints to the realization of rights... (United Nations Development Programme (UNDP), 2000: 1, 2, emphasis added).

Governance is defined within national, political institutions, and an integrated world economy based upon an international division of labour needs effective global institutions to manage cooperation between decentralized national economies. Such institutions must be transparent and fair, allowing people in poor countries to assert their rights and share in the benefits of an expanding (global) technical division of labour. The emphasis is not upon independent individuals competing to maximize utility in consumption, but upon dependent individuals socially cooperating to produce. Although there is a role for economic incentives (and therefore inequality) to ensure efficiency in the production process, such an emphasis on free exchange has to be subtly tempered with economic management to avoid the excesses of competitive free markets (inequality and impoverishment). Extremes of wealth and poverty (both nationally and internationally) mitigate against an evolving, cooperative, process of production. In

order to foster economic cooperation within (global) society, economic policy has to remain within the (national) technical parameters of social cooperation.

Ultimately, people are dependent on each other within the technical division of labour. Such dependence deepens with technical change, and the complex process of globalization is a reflection of this widening global division of labour. However, the imperative remains: the global economy has to be managed to reflect national, local needs. State intervention and economic management is a pre-requisite for human progress.

'The state has primary responsibility for ensuring that growth is pro-poor, pro-rights and sustainable . . .' (UNDP, 2000: 11): good governance. Progress cannot be a consequence of global, 'free' markets.

. . . new technology will lead to healthier lives, greater social freedoms, increased knowledge and more productive livelihoods . . . Without *innovative public policy*, these technologies could become a source of exclusion [impoverishment], not a tool for progress [higher/more secure living standards]. (UNDP, 2001: 1, emphasis added)

Where people's potentials are understood to be dependent on society, then the world economy should be adapted to local needs: *localization*.

The policies bringing about localization are ones which increase control of the economy by . . . nation states. The result should be an increase in community cohesion . . . (Hines, 2000: 5).

And the appropriate global institutions of governance should reflect, equally, all nation states: the United Nations.

#### IV Dialectics: globalization and interdependent individuals participating

In the analysis of an emerging, complex global order, and the specification of a social feedback mechanism creating 'organized complexity' out of apparent chaos, the (reductionist) emphasis of the World Bank suggests that a competitive, market environment, in which individuals are at liberty to follow their subjective preferences, will lead to a pattern of progress. Individuals' unique potentials will be realized in the effort to 'maximize utility'.

Complexity theory might promote such a process, modelling markets as information processes, with development policy directed to facilitating the free flow of information between billions of independent consumers (see Montgomery, 2000).

Progress is consequent on nation states adapting to the exigencies of global markets: *globalization*.

However, the emphasis in the Human Development Reports, reflecting the (holistic) development strategy of the United Nations Development Programme, is that individuals are not 'free to choose'. The social parameters of human existence, upon which individuals depend, constrains people's actions and activity. Essentially, individual choice is limited to facilitate social co-operation within the exigencies of a technical division of labour. Progress is defined technically and institutionally, and not by hedonistic expediency. Individuals' choices, as expressed through market exchange, have to be managed to reflect local, social needs.

Within this strategy complexity theory might be appropriate in identifying the 'path dependence' between the institutions through which the social structure is organized, a structure which evolves with the shifting technical parameters of production (see Prasch 2000).

Progress is a reflection of the adaptation of international economic relations to local, technically based, social imperatives: *localization*.

That we approach changing human behaviour in general, and globalization in particular from a reductionist (individual), or holist (social) standpoint, is an assumption, a matter of *faith* in what we believe is the 'dynamic' of social experience. Such beliefs arbitrarily define and dogmatically assert the intellectual parameters of the conception of *reality*. Either organized patterns of behaviour between billions of individuals within complex systems are a reflection of an essentially competitive, individualistic human nature, or the technical prerequisites of human existence, which presuppose a social structure to manage individual, cooperative survival, is the basis of organized complexity.

However, human beings, as social animals, only exist in some form of society; and societies can only be conceived of as a product of individuals' behaviour. The analysis of organized, complex social activity cannot simply begin from the 'individual' or 'society'. People are *social individuals*.

... individual beings do not exist in isolation, but arise as a *consequence of social life*, yet the nature of that social life is a *consequence of our being human*. (Rose *et al.*, 1984: 11, emphasis added)

Neither the social structure nor the individual is the independent (determinant) or dependent (determined) variable: each is the cause and effect of the other.

Globalization and localization are two sides of the international economic integration coin.

The relationship between the individual and social existence is *dialectical*. Individuals are neither 'dependent on' nor 'independent of' society: people are *interdependent within* society. People can achieve more acting in concert with other people than by acting independently; individuals' potentials evolve as emergent properties with social experience. The feedback mechanism which is so fundamental to complexity theory is the process by which individuals' potentials evolve and change within an emergent social order, itself moulded by those potentials. Individuals' potentials are *social potentials*.

Order and disorder are not alternatives but a dialectical relation of contradictions: they are not mutually exclusive but aspects of an evolving process of experience – 'order and disorder are [not] dichotomous and opposites ... but rather stages in a process of dynamic and transformational becoming' (Byrne, 2001).

The dialectic, as such, explains nothing, proves nothing, predicts nothing, and causes nothing to happen. Rather, dialectics is a way of thinking that brings into focus the full range of changes and interactions that occur in the world. (Ollman, 1993: 10)

Human beings are unique in the animal kingdom with regard to their 'self-consciousness'.

... creatures look up into the night sky and see the stars. But we stare at them, wonder how many there are, wonder how far away they are, wonder how they got there, wonder what they are made of, wonder – indeed – why they are there at all... We see no evidence that any other creature looks outside its *personal* universe in this manner. (Stewart and Cohen, 1997: 6, emphasis added)

We are able to reflect upon *our own* activity, and build scenarios in our minds, replaying our experience, planning how to better fulfil our creative potentials.

However, we can only know what our potentials might be *through* our social experience; and we can only realize our emerging abilities *within* social activity. *Individually* we reflect upon our *social* past to construct our *social* future: tomorrow was born yesterday.

Humans, as a species, have two unique attributes – ‘... knowing the past and planning the future’ (Jones, 1994: 300) – attributes which define the feedback mechanism, achieving ‘ordered complexity’.

Where people are understood to be socially interdependent, progress, the enhancement of human potentials, is a consequence of deeper social interaction, and society becomes ever more complex. The appropriate development strategy is the facilitation of people’s participation in the social organization of human existence, so that the emerging social order might reflect people’s emerging potentials.

Ordered complexity is achieved by the institutional basis of social order being complementary to people’s evolving talents, needs and ambitions: an institutional order of society which evolves with the emergence of a deeper, more complex *social* division of labour, organized to realize individuals’ enhanced social potentials.

Progress is not beyond our control: we are not passive in the face of biological imperatives or social exigencies which determine our activity. Neither of these aspects of experience can be ignored by assumption. Reductionist and holist analyses are contradictory aspects of the dialectics of knowledge, where knowledge is historically defined, evolving as a process reflecting individuals’ changing social experience. We actively, socially, *create* our future. A future in which progress is the institutional adaption of social organization to the changing social potentials and needs of unique individuals.

In the feedback process by which ordered complexity emerges, the *mind matters*. People intuitively reflect on the social parameters of their experience, identifying the constraints which frustrate their emerging potentials. And individuals imagine a future more or less qualitatively different from, but based upon, their past: the process of *praxis*.

Only men *are* praxis, which, as the reflection and action which truly transforms reality, is the source of knowledge. (Freire, 1972: 73, emphasis added)

The future is (dialectically) both ‘necessary’ and ‘open’. Necessary, because *individuals* have to adapt to extant institutionalized complexity, an adaptation which will more or less constraint emerging potentials. Open, because creative, self-conscious human beings have it in their *social* power to intervene in the world and construct a more fulfilling ‘institutionalized complexity’: dialectical reasoning is the *logic of emergence*. And the dialectic lies in the relation between the individual and society; it is the process of the *creative mind*.

The development of life is determined by the tendencies of life. But history does not realize the wills of individuals, it is only determined by them, and in turn determines them. (Caudwell, 1986: 179/1)

The 'feedback mechanism' which creates an emerging pattern of complex social behaviour, is the human instinct to realize our creative, evolving *social* potentials. To continually widen our horizons; to push forward the boundaries of possibility – to *progress*.

Emerging human creativity is the '...mysterious process of self-organization' (Cowan, 1994: 1) in complex systems. For a changing society to reflect and facilitate the realization of people's evolving potentials, individuals must participate in the social organization of human existence. Organized complexity is a consequence of an evolving democracy, where *democracy is a process*; the institutional form in which the extension of individuals' greater social interdependence and interaction is reflected. With the deepening complexity of social interaction, the institutions of democracy become ever more inclusive of human existence.

But, of course, any institutional organization of social life, as individuals potentials evolve, sooner or later advantages particular people, creating vested interests in the maintenance of the social status quo. And, in as far as political power protects social advantage, the process of social change to reflect people's emerging potentials is not a priority. At times the extant institutional structure of society is unable to accommodate people's emerging social potentials. For instance, within societies based upon competitive markets, higher productivity and technical change, which presages rising standards of living, invariably implies unemployment for some people; and more generally, with social relations between people reduced to market exchange relations between individuals, people's inherent creativity, which is a *social* relation, is stymied by the imperative to generate profits from production and follow market imperatives. The result? Alienation.

There is not space here to discuss the possibility and effect of the alienation of people from their creative human potentials, but see Ollman (1976) and Holloway (2002: chapters 4, 5 and 6). My concern here is to address the emerging pattern of order within a globally complex social system.

If people's, evolving, enhanced social potentials imply deeper (complex) social interaction within a global economy, then for an ordered pattern of social behaviour to reflect individual's unique social potentials, people must participate in the social control of personal experience. There must be a process of democracy: the institutions by which people politically participate have to evolve to reflect the growing complexity of people's deepening interdependence.

Globalization and localization unite at all societal scales . . . [and] local activities accumulate to create chaotic but global outcomes . . . there is no collective vision on how sustainability and democracy [organized complexity] can combine . . . This will need a special *form of new* governance . . . (O'Riordan and Church, 2001: 1, 24, emphasis added).

Within the process of globalization, the material basis and the social potentials of life have radically evolved. The degree of human interdependence [complexity] transcends national borders.

On the one hand production processes have been decentralized – for instance 'just in

time' production, and different stages of the same process being performed in different countries to minimize costs and maximize profits. On the other hand, there is a deepening of the centralization of command and control of production: '... national [internal] productive apparatuses become fragmented and integrated *externally* ...' (Robinson 2001: 159, emphasis added). Yet the political regulation of economic activity, the basis of social cooperation between individuals, is still *internally* (nationally) rather than externally (internationally) situated.

At the economic level, the global logic of a world economy prevails, whereas, at the level of the political, a state-centered logic of the world-system prevails. (Robinson, 2001: 162)

However, it is evident that the institutionalization of economic activity, by which international market exchange is regulated, is evolving internationally. There is a political vacuum at the level of the national state leaving individuals impotent to exert any but the most trivial democratic control over national/local, economic/development policy, and the realization of their emerging potentials.

It is commonplace to read in the literature on globalization, that the economic imperative to adhere to the policy dictates of the World Trade Organization, the International Monetary Fund or the World Bank, economic priorities which themselves reflect debates within, and decisions of, such supra-national political forums as the Group of 7, the recently formed Group of 22, the Organization of Economic Cooperation and Development, the European Union, the Association of South East Asian Nations, the North American Free Trade Agreement, etc . . . , has rendered nation states powerless to pursue local development objectives.

For instance, in South Africa, after the fall of the apartheid regime in 1994 and the democratic election of an ANC government led by Nelson Mandela, the post-apartheid vision of a society that promised economic as well as political freedom – housing, water, electricity, and basic needs being met by public works programmes – was stymied by the World Bank and the International Monetary Fund, pressuring the government to follow 'sound macroeconomic policies'. Incentives had to be offered to foreign capital to invest in an economy geared to economic growth rather than redistribution to meet social needs. The resultant privatization of public services, rising unemployment, declining real wages and cooperate tax cuts have meant over 500 000 people have lost their jobs; wages for the poorest have declined by over 20%, electricity and water prices have increased, etc. And the foreign investment driving a growing economy has yet to materialize (see Bond, 2001).

The model is flawed. Some individuals are wealthier, but few jobs have been created. Where there should be new productive capacity, there is massive debt. And at stake is not just the fortunes of a few companies, but the very legitimacy of the capitalist system. (The South African *Financial Mail*, 1999, quoted in Bond, 2000: 46)

Apartheid based on race has been replaced with an apartheid based on *class*.

... cooperation in producing commodities is presided over by a distinct *class* of individuals with property rights over the social means of production, control over investment decisions and the capacity to appropriate profits. (Petras and Veltmeyer, 2001: 156, emphasis added)



Until there is an international process of political and social change, which accommodates individuals' emerging social potentials to an integrated global economy, a process of *human dignity* – the realization of human potentials – social existence will be more or less conflictual, and the complex international social order will be maintained by more or less repression. And the crisis of the world economy and global 'complex' society will deepen.

While the intellectual debate on 'ordered complexity' and 'progress' is restricted to questions of *globalization* or *localization*, a debate which is unable to address the *qualitative* change in human potentials consequent upon deeper social interaction between individuals, a theoretical consideration and understanding of the appropriate social and political institutionalization of economic activity for progress is impossible.

The social feedback mechanism reconciling individuals' evolving social needs and potentials with social organization, is their political participation in the organization of order in (global) society. Evolving, qualitatively distinct forms of social and political organization, based on democratic, political participation, in a context which allows individuals', global, social potentials to be realized, can be the only development strategy.

When progress – the realization of individuals' emerging social potentials – and deeper complexity, is stymied by anachronistic social institutions preserving extant vested interests the disadvantaged have to organize themselves to effect progressive social change.

Progress is not a reflection of globalization or localization, but *mobilization*. And action to promote development and progress is not a question of controlling individuals to compete within free markets, nor institutionally managing individuals to cooperate within managed markets, but actively facilitating people to organize and empower themselves to participate in the social organization to promote human dignity. The creative process of building an emerging, global society, to reflect changing human potentials.

People need to 'act locally' but think 'globally'.

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