FRED EMERY ORATION

Systems thinking (and action) FROM the new millennium: Learning from the future.

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Prologue

Fred Emery, was an amazingly perceptive and prescient systems scientist, who was, without a shadow of a doubt, the father of the systems movement down here in the antipodes, to which he returned in the 1970s after a very distinguished career at the Tavistock Research Institute in London. He had a prime interest in the nature of work and in particular in how people organised themselves and the machines and other resources with which they worked, to achieve their goals and maintain their ideals and values, in the face of what he recognised as often "turbulent environments". I first met him at the Australian National University soon after his return, when I was involved as a participant in one of his Search Conferences. His was an unforgettable illustration of theory in practice, walking his talk with all the confidence that long experience and scholarship together can bring. Over subsequent years, our paths would cross from time to time, either in the context of other Searches, or in dialogue about systems education, which was a topic about which, it would be fair to say, we both had obsessive tendencies!

From what I knew of him (a) through his extensive writings, and (b) through our infrequent, but not impassionate meetings over a twenty year period, Fred Emery would have been very approving of this meeting of ours, for at least three reasons. Firstly, as one of the champions of socio-technical systems and social ecology, he would heartily agree with our various attempts at conjunction. Thus he would have applauded, I am sure, this joint endeavour between the systems dynamics folk and the other systems mob, between organisational types and the environmental crowd, and, along with others, between you New Zealanders and we Australians. As aware of the vital significance of 'requisite variety' as anyone, he was also very appreciative of differences that were too different for coherent handling, in spite of their apparent similarities. In his Editor's Introduction to the book 'Systems Thinking' for instance, he explained that the omission of writings in the OR tradition from such a book was because "its methods and language are so different as to require separate treatment" (Emery 1969).

His own work perfectly exemplified this spirit of conjunction – with a large percentage of it conducted in collaboration with others, including such other systems giants as Eric Trist, Russell Ackoff, and West Churchman, and with his social scientist wife Merrelyn. Primary among the concerns of this group of luminaries was the idea, novel at the time, that human organisations, as "open living systems" "should be analysed accordingly" – in conjunction with an analysis of the environments in which they must operate. Not that Emery underestimated the difficulties of that (nor the importance of sustaining our sense of humour while so doing): "The fact that it faces us with the task of analysing forbiddingly complex environmental interactions gives us no more of an excuse to isolate organisations conceptually than the proverbial drunk had when searching for his lost watch under the street lamp because there was plenty of light when he knew that he had lost it in the dark alley" (Emery 1969).

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In the second place, he would have heartily endorsed our efforts at exploring new events, things and ideas in systems terms and thus keeping the systems spirit alive, even if that created tensions of difference between the scientific position that he so consistently espoused as the foundation for his own system's perspective, and the more applied philosophical stance assumed by many of us here today.

And finally, and most emphatically, he would have roundly supported our attempts at further synthesis of systems ideas with thoughts about the future. He was, after all, the major architect, along with his wife Merrelyn, of the Search Conference process, which explicitly reflects just such a synthesis.

A Systems View of the World

Indeed it is on this particular synthesis that I wish to concentrate here, for over the past few years, it has been a matter that has also seriously entertained the attention of my colleagues and I at the Centre for Systemic Development at Hawkesbury. While there are some important differences between the Search Conference and our Critical Learning Systems approach, there are a number of foundational ideas that are common to both. The most significant difference between the two lies in the distinction between the paradigmatic foundations of the systems thinking and applied actions of the behavioural scientist, and those of the applied practical philosopher. Where Emery and his distinguished colleagues reflect the former category, the Hawkesbury group would see itself in the latter. Where the concern of Emery and his colleagues was with the 'systems out there', at Hawkesbury, our focus has been on the 'systemic nature' of the process of inquiring into whatever is happening 'out there'. As Ackoff and Emery (1972) would put it, they sought, as behavioural scientists, "to define the concepts of function, goal seeking, and purpose with all the rigor of the concepts used in the physical sciences". Such a 'causal-mechanistic' perspective, as Werner Ulrich (1983) reminds us, is that of spectators observing the behaviour of systems, a view in stark contrast to that of the practical philosopher (such as he) for whom the concern is "the intentionality and self-reflectiveness of an agent". That said, Emery and his co-workers are careful to emphasise the power of systems science first and foremost as a conceptual tool for understanding reality.

Emery and Trist (1965) for example observe that: "in a general way it may be said that to think in terms of systems seems the most appropriate *conceptual* (my italics) response so far available when the phenomena under study – at any level and in any domain – display the characteristics of being organized, and when understanding the nature of the interdependencies constitutes the research task". Earlier these same researchers had talked of socio-technical systems in the following terms: "considering enterprises as 'open socio-technical systems' helps to provide a more realistic picture of how both are influenced by and able to act back on their environment. It points in particular to the various ways in which enterprises are enabled by their structural and functional characteristics ('systems constants') to cope with the 'lacks' and 'gluts' in their available environment"

This recognition of the crucial nature of the 'open' relationships between 'systems' and their 'environments' was to prove a crucial foundation to Emery's Search Conference process, as we shall soon see. Writing with Trist, he proposed "that a comprehensive understanding of organizational behaviour requires some knowledge of the following set, where L indicates some potentially lawful connexion, and the suffix 1 refers to the organization and the suffix 2 to the environment:

$$L_{1\ 1},\ L_{1\ 2}$$
$$L_{2\ 1},\ L_{2\ 2}$$

$L_{1\ 1}$ here refers to processes within the organization – the area of internal interdependencies; $L_{1\ 2}$ and $L_{2\ 1}$ to exchanges between the organization and its environment – the area of transactional interdependencies, from each direction; and $L_{2\ 2}$ to processes through which parts of the environment become attached to each other – (i.e. its causal texture) – the area of interdependencies that belong within the environment itself" Emery and Trist (1965). Reinforcing the significance of the latter, they proposed a typology of 'causal textures' which identified four ideal types of environment which they termed: placid randomized, (b) placid clustered, (c) disturbed-reactive, and (d) turbulent fields, where this turbulence resulted from "the complexity and multiple characteristics of the causal interconnexions". With respect to such complex fields, "individual organizations, however large, cannot adapt successfully simply through their direct interactions" (Emery and Trist 1965).

Of signal importance here was the emphasis that was given on the possibility of reciprocal influence between the environment and systems embedded within it: Thus just as environments impact on systems, so too can they be impacted upon by those very systems. Environments (particularly turbulent fields) influence systems which influence environments (in ways which can create turbulent fields).

A key influence on Fred Emery's organizational behaviour systems perspective came through his involvement in a project funded by the British Social Science Research Council 'to devise a conceptual scheme for the analysis of men (sic)-machine- equipment relations with the more common unit operations'. As he was to later record (Emery 1977) this study was to conclude that: "the basic unit for design of socio-technical systems must itself be a socio-technical unit and have the characteristics of an open system" – one that "may spontaneously reorganize towards states of greater heterogeneity and complexity…(and can)…achieve a 'steady state' at a level where they can still do work (Emery and Trist 1960). The key unit of analysis identified was "an appropriately skilled and sized semi-autonomous group that had the potential of simultaneously controlling from their own immediate experience the basic set of parameters of gain and cost in the total system" (Emery 1977). From the over twenty odd years of experience that he claimed, "with a wide range of technologies and societies", Emery (1977) would conclude that: "if reasonably sized groups have accepted a set of production targets and have the resources to pursue it at reasonable reward to themselves they will better achieve those targets than they would if each person was under external supervisory control". The key to the notion of "reasonably sized" groups was that they had "sufficient autonomy and are sufficiently small to allow face-to-face learning".

As Weisbord and Janoff (1995) have recently emphasised, Emery was quick to acknowledge the importance of social psychological theories, as well as systems theories in informing his understanding of the dynamics of the work groups that he studied. In particular, he and his colleagues explicitly drew upon the consensus research of Soloman Asch (1952) and the group dynamic theories developed by Wilfred Bion (1961). Working with Thorsrud in a major project with Norwegian industry, and drawing on these theoretical foundations, Emery would conclude that there seemed to be a set of six "minimal requirements that humans valued in their work activity: (1) Freedom to participate in decisions directly affecting their work activity, (2) A chance to learn on the job and to keep on learning, (3) Optimal variety, (4) Mutual support and respect of their work colleagues, (5) A socially meaningful task, and (6) Leading to some desirable future (Emery and Thorsrud 1969). These notions would, in turn, lead him, while working with Russell Ackoff, to propose the idea of "formulating a model of man (sic) as an

ideal-seeking system" (Ackoff and Emery 1972). Ideals, they would argue, enable people (1) to maintain continuity of direction and social cohesiveness by choosing another objective when one is achieved, or the effort to achieve it, has failed; and (2) to sacrifice objectives in a manner consistent with the maintenance of direction and social cohesiveness.

As Fred Emery's research with semi-autonomous, self-organising, ideal-seeking, and learning groups progressed, the significance of their planning for their own futures became increasingly evident, and he started to explore how thinking in systems terms might be applied to the issue of active self-adaptation (Emery and Trist 1972), particularly in turbulent field environments.

<u>Searching for the Future</u>

Finding common ground as the basis for action is a challenge that continually confronts those in organisations and communities. This is especially so with respect to the need for adaptive changes at times of turbulent social upheaval. The development of the Search Conference, as a medium for effective dialogue about the future, was a response to this challenge (Emery 1976). While the foundations were laid through the work of Emery and his colleagues in the early 1960s, the Search Conference process was not really formalised until the mid 1970s (Emery (M) 1993). In its essence, it represents a synthesis of his long experiences with self-organizing work groups, his research collaborations with Trist, Ackoff, Thorsrud, Churchman and with Merrelyn, his socio-psychological theoretical foundations, especially as influenced by Bion and Asch, and his socio-technical systems scholarship, with a particular appreciation of von Bertalanffy's 'open systems' logic.

The Search Conference is grounded in the principles of the participative democracy and effective dialogue of self-managing groups. "Values, ideals and broad encompassing social processes are the main fare.…as they are the main features of social change" (Emery 1976). The four essential forms of exploration that are used in the process directly reflect the system/environment matrix mentioned above. Weisbord and Janoff (1995) describe these exploratory domains in the following terms: (a) the relations among external environmental factors "outside" the boundaries of the search focus, (b) relations within the focal system, (c) the impact of the external environment on the system, and (d) the system's potential to influence its environment". Such a framework allows participants to gain a systemic appreciation of the matter they are exploring, which also provides a context for the notion of the group as an 'ideal-seeking system' itself. Planning options become apparent through the process itself, and in particular, during the final stages of the methodology when participants explore the nature of the differences that they can identify between the ideal future and the probable future – and what needs to be done to trend the latter more toward the former. Effective dialogue at this stage will invariably take on the same essence as the debates about "desirable and feasible changes" that are so characteristic of the soft systems methodology (SSM) (Checkland 1981).

And it is this mention of Peter Checkland that provides a most appropriate opportunity to now shift the focus of this paper from an appreciation of the work of Fred Emery and his colleagues, to the work on Critical Learning Systems at Hawkesbury, and the emphasis there on learning from the future.

<u>The Third Dimension</u>

It was the work of Checkland and his colleagues at Lancaster University that was as responsible as any other factor in the transformation of the Hawkesbury group from neophyte systems scientists to practical, applied systems philosophers. We were seduced, as indeed we remain, by

the SSM logic of the shift in systemicity from reality 'out there' to the process of inquiry into matters 'out there'. A significant outcome of this shift in our perspective has been the addition of, what might be referred to as a third dimension to the Emerian system/environment model. In addition to the focal system and the environmental suprasystem, we would embrace a critical learning subsystem, which indeed would be the source of the other two – as social constructions!

Before exploring the significance of this, it is appropriate to briefly describe the evolution of the Hawkesbury perspective.

The Centre for Systemic Development at Hawkesbury, was established just a few years ago, in 1996, with the mission to further the development and application of systems thinking and practices to matters of community and organisational development. It would be designed and managed to reflect its own systemic development principles, and would be deliberately 'located' at the interface between a university (Western Sydney) and communities and organisations beyond its walls. It would endeavour to be a 'critical learning system' that would beget other such systems in a manner that would allow their interconnections into what might be considered a networked society (Castells 1995).

While still very young, the Centre at Hawkesbury had its genesis, in 'systems' work that had been conducted in the School of Agriculture and Rural Development, and the School of Social Ecology at that institution, over the preceding two decades. The grand endeavour over that time, was an extended action research project, involving literally hundreds of participants at a time, into the ways that they (we) learned how to deal with (and indeed contribute to improvements in) complex and messy 'everyday' situations that essentially involved their (our) relationships with the surrounding environments. In the case of agriculture, the motivation lay in central concerns about what might be termed the paradox of intensification. In response to their ever-declining economic terms of trade, farmers, to remain viable, had to increase their levels of productivity. Characteristically they achieved such gains through an intensification of their production practices basically through their adoption of technological innovation. The paradox lay in the fact that the more they intensified, the less the chance they had of being able to maintain such intensity. For as they intensified their production practices, so they intensified the degrading impacts that those practices had on both the bio-physical and the socio-cultural environments in which they had to operate.

Intensified agriculture, from being seen as the solution to the Malthusian challenge, was becoming the problem: Environments influenced farming systems that influenced environments. From concerns about how to manage the risks of often unpredictable weather patterns and volatile commodity markets (environment/system impacts), farmers had suddenly to learn how to manage the risks associated with changes in their environments which collectively they themselves had triggered (system/environment/system impacts). The chemical biocides used in pest management became pollutants of ground water and of food commodities themselves, while playing a significant role in the reduction of natural biodiversity. The physical acts of deforestation and soil cultivation, greatly accelerated the erosion of soil, while the use of chemical fertilisers, added to pollution problems. And to these matters needed to be added growing ethical concerns about many intensive livestock practices and the emerging use of genetically modified organisms. Then there was the matter of health and safety of those who worked in agriculture and who lived in rural areas, and even the aesthetic implications of changing landscapes. From a central, and relatively simple concern with technical efficacy and economic efficiency, agriculturists suddenly had to learn to deal with the complex matters of ecological responsibility, of ethical defensibility, of aesthetic acceptability, and even spiritual compatibility (particulary with respect to so-called native title, and the land claims of indigenous people).

As the Hawkesbury social ecologists, among others, have observed, such a situation, of the negative impacts of human activities on both forms of the environment, is certainly not confined to agricultural practices. The vast majority of human activities have the potential to impact very seriously on both 'nature' and 'society' on a scale that can literally reach global proportions. The local can become global; witness the accumulative impacts of a host of human activities on the climate of the entire globe or on the size of the hole in the Ozone layer, on the one hand, and of globally pervasive neo-liberal capitalism on flows of capital, trade and production across the planet, on the other. The concerns here of course are not confined, in either case, to the phenomena themselves but significantly embrace the impacts that each has on people's fears, values, ideals etc. The complexity of the interactions between the natural and social environments is such that it makes little sense to discriminate between them any more. As Latour (1993) puts it "[a]ll of culture and all of nature get churned up again every day" and this makes for the analysis of the nature of the 'causal texture' of today's 'ultra-turbulent' environments, exceptionally difficult. We are in a new age where, as Ulrich Beck (1992) puts it in reference to his observation that we now live in a 'risk society', "in the course of the exponentially growing productive forces of the modernization process, hazards and potential threats have been unleashed to an extent previously unknown".

That provides us with another focus, that of the nature of science and technology themselves, for they are among the effects of the 'modernization system' that impact upon the environment (and that ironically, we can only know through the methods of techno-science). As Beck (1992) sees it "we are concerned no longer exclusively with making nature useful, or with releasing mankind from traditional constraints, but also and essentially with problems resulting from techno-development itself. Modernization is becoming reflexive; it is becoming its own theme" - we have to learn how to confront the effects of risks that cannot be dealt with by the institutions of the industrial society which were responsible for the threats in the first place. Daily we face matters that are as much concerned with ethical matters as they are of reason, and we are ill prepared for that. As Werner Ulrich (1993) has insisted "moral judgement has been eliminated from our concepts of rationality as far as they are actually built into existent scientific and systems paradigms." We need to design learning processes that restore these capabilities to systems paradigms at least: Inquiring systems that are able to embrace conflicts of difference in value and belief assumptions, including epistemological beliefs that extend beyond scientific objectivity.

An equal, if not indeed primary focus to thinking about the 'big issues of the day' from a systems perspective then, is the matter of endowing learning systems with the capability of thinking about thinking about systems perspectives, and how they might be developed.

What needs to be added to the matrix formed by the focal organization (the system, 1) and the environment (the suprasystem, 2) of Emery and Trist (1965), is (0) the critical learning subsystem that brings each into being (including itself), while being concurrently capable of critically reviewing the manner by which it does that. Following Ulrich (1983), a critical review would "mean to make transparent to oneself and to others the value (and belief) assumptions underlying practical judgements".

The modified matrix would then appear as

$$L_{1\,1}, \ L_{1\,2}, \ L_{1\,0}$$
$$L_{0\,1}, \ L_{2\,1}, \ L_{2\,2}$$
$$L_{0\,0}, \ L_{0\,2}, \ L_{2\,0}$$

Using Emery's language: $L_{1\ 1}$ refers to processes within the organizational system – the area of internal interdependencies; $L_{1\ 2}$, $L_{2\ 1}$, $L_{1\ 0}$, $L_{0\ 1}$, $L_{0\ 2}$ and $L_{2\ 0}$ to exchanges between the system, its environment, and the learning subsystem – the area of transactional interdependencies, from all four directions; $L_{2\ 2}$ to processes through which parts of the environment become attached to each other – (i.e. its causal texture) – the area of interdependencies that belong within the environment itself; and $L_{0\ 0}$ to processes within the critical learning subsystem – the area of self-revealing internal interdependencies within the learning process.

Using different language, we could state that judgements about the state of the 'system' $L_{1\ 1}$ and about what constitutes improvements to it in the face of what is judged to be the state of the 'suprasystem' $L_{2\ 2}$ are made by the 'critical learning system' $L_{0\ 0}$. It is $L_{0\ 0}$ that also makes judgements about what it perceives to be the interactions $L_{1\ 2}$ and $L_{2\ 1}$ between the 'system' $L_{1\ 1}$ and the 'suprasystem' $L_{2\ 2}$, as well as judgements about the impacts $L_{1\ 0}$ and $L_{2\ 0}$ of both 'system' and 'suprasystem' on itself, as well as the obverse – $L_{0\ 1}$ and $L_{0\ 2.}$

The image that this portrays is thus one of a highly dynamic, but self-organizing 'three-dimensional' process through which a critical learning system is continuously bringing forth new constructs of systems in co-adaptation with the turbulent environments in which they are construed to be embedded, with these constructs in turn, impacting upon the system doing the construing! Borrowing from Koestler (1967) with but one amendment, we can present this three 'tiered complex' of sub-system, system and suprasystem, as a holon, and because our emphasis is on the process of 'situation improvement, we can talk of the development holon.

This holonic approach to development privileges the view that the systemicity lies not 'out there' as real world systems interacting with equally real world suprasystems (the Emery perspective) , but within the process of inquiry into matters 'out there' to which it can attribute appropriate properties - and concerns. The learning system is an heuristic devise for collective interpretation of events and ideas and insights, as the basis of judgement to act. From this persective, risks are as much a matter of 'normative outrage' as they are of 'objective hazard', as Peter Sandman (1992), among others, has long maintained. Positivist science is thus seen an inadequate paradigm as the basis for planning and designed futures, and identified as such by critical learning systems.

At Hawkesbury, embracing the normative and the rational, we have built our concept of systemic development as a *future-oriented participative process of community and organisational development in which both the activities and outcomes aim to be as:*

Aesthetically acceptable as they are technically possible,
Ethically defensible as they are economically viable,
Culturally feasible as they are socially desirable,
Spiritually compatible as they are practically manageable,
Ecologically responsible as they are politically supportable.

These are essentially 'judgement criteria, and while the distinctions are certainly not absolute, we can argue that each of the left hand side partners of the couplets above are essentially normative, while the right are essentially rational.

Like Fred Emery's was, our concern is essentially for the responsible development of communities and organisations by those who are the actor stakeholders in the process extended to include those who are likely to be affected by any outcomes. We see such development as an ongoing process of 'situation improving' typically in complex and messy circumstances, and

achieved through continuing dialogue. Also like him and his co-workers over the years, we see significant advantages in (a) assuming a global context, (b) pursuing a systemic perspective, and (c) appreciating the significance (and difficulty!) of participative democracy.

However, where his approach could be considered to be what we might term *ecocentric* (grounded in an objectivist) epistemology, we consider ours to be *holocentric* (reflecting a pluralist and contextual epistemology). Where his concerns were for the system/environmental suprasystem complex, ours embraces the third dimension of a critical learning subsystem, which 'brings the other two into existence'. In this manner the latter is analogous to Checkland's (1981) human activity systems, while used in the style of Ulrich's (1983) critical heuristics. Finally where the common ground sought by Emery and his colleagues was an ideal future state, the consensus sought through the Hawkesbury approach is for a rigorous strategies appropriate to deal with range of plausible future states in a manner akin to that proposed by Peter Swartz (1991) in the process of scenario planning. Here the motive is not to 'get the future right', as that is deemed impossible, given the turbulence of the environment, but to avoid 'getting it wrong'! Rather than trying to identify and then reach for an ideal future state, or at least use that ideal as a 'benchmark' against which the current trajectory can be judged and strategies appropriately adjusted, the aim is to design a range of strategies relevant to the range of futures identified as plausible.

The logic and 'nature' of critical learning systems have been published elsewhere in some detail (Bawden 1999). It is appropriate here however to also provide some of the details in as far as they are relevant to the particular issue of the matter of 'learning from the future'.

It is important to re-emphasis the fact that critical learning systems (CLS) are constructs that have systemic properties attributed to them. They are not 'real things' nor 'actual events', but conceptual activities bounded by conditions that are decided by those who agree to participate in situations where CLS are used as frameworks for scenario development and strategic design. They are assumed to comprise two key sub-systems (ss)– an experiential learning ss, and an inspirational learning ss. Involvement with the first allows sensual, concrete experiences to be transformed into conceptual understandings (which, without engagement of the second ss, leads to thoughtful action). Involvement with inspirational learning allows spiritual insights to be accessed (which without engagement with the experiential ss, leads back on itself – perhaps to higher orders of self-enlightenment). It is the systemic interaction of experientially derived cognitive concepts with spiritually 'informed' normative insights that creates meaning, which can then be transformed, again experientially, into meaningful actions. The dynamic of the process lays in the clear 'tensions of difference' in the nature of the two subsystems.

Tensions of difference could also be proposed between the subsubsystems within each of the two subsystems. In the manner of SSM, each of the two subsystems mentioned could itself be considered as inquiring systems composed of a 'set' of recursively inter-related subsystems – different human activities. Taking the four activities described by Kolb (1984) as comprising the experiential learning cycle, the experiential subsystem can be envisaged as comprising the four subsubsystems of (i) observing, (ii) thinking, (iii) planning, and (iv) acting. These activities, as well as their dynamic interactions, 'become known' to the subsystem itself through its ability to monitor its own activities through a 'meta-learning' capability. Critical learning systems are able to be critical of their own processes of learning through a 'higher order' 'meta-system' in which they are embedded. Finally, there is a third level, 'epistemic system' through which learning systems are able to be critically self-reflective with respect to the particular worldview(s) or weltanschauung(en) that frames their other activities.

A central issue here, as Marcia Salner (1986) has so clearly elaborated (and we at Hawkesbury have long experienced), is that the ability to 'think in system's terms' and thus effectively 'act systemically', comes only with a particular stage of epistemic development. In other words, critical learning subsystems as envisaged here, need to engage in epistemic learning in order to be able to, firstly elaborate the epistemic positions that they typically assume, and secondly to be able to adapt these where appropriate. Significantly, groups of people within communities or organisations who have not achieved a particular stage of epistemic development, will not have systemic capabilities sufficient to be able to 'bring their own systems nor suprasystems into being', let alone analyse them.

Critical learning systems thus have the capability of being self reflective, and adaptive, at three levels of learning involvement (i) about the matter to hand, (ii) about the process through the matter to hand is being learned, and (iii) about the epistemological and ontological assumptions that frame what is being learned at (i) and (ii).

By its very nature, the normative inspirational learning subsystem is unable to be self-reflective in any critical sense. That said, a set of activities have been attributed to it in order that its axiological essence can be portrayed, and its process operationalised. Thus it has been argued that the inspirational learning subsystem can be envisaged as comprising the activities of (i) disengagement, (ii) focussing, (iii) accepting, and (iv) applying (Bawden 1998). The crucial outcomes of this essentially spiritual 'process' are expressions of those value assumptions that 'inform' aesthetic and ethical judgements. It is the conjunction between the inspirational and the experiential that thus allows the accommodation of all ten of the 'judgement criteria' of systemic development previously listed.

In practice, critical learning systems assume a clear appreciation of the need to be continually 'fluxing' from one set of learning activities, within and between the different subsystems, and the 'system nests' in which they are embedded, to another, while being perpetually sensitive to emergence!

As Emery and his colleagues have emphasised over the years, open and democratic dialogue is an essential aspect in the search for common ground within groups of people. The same sentiment of course, must be appreciated as a property of critical learning systems that seek to make 'judgements' about their own responsible development. The self-recognition of distorting influences on communication within these subsystems is therefore a critical property of them. This aspect reflects the concerns extensively expressed by writers such as Habermas (1971) and Ulrich (1983). Warnke (1995) puts it well in her interpretation of the general question with which Habermas begins his account of communicative rationality: "How does the employment of language in contexts of interaction produce mutual agreement (through consensus rather than mere compliance achieved through coercive or manipulated ways) on a course of action, a fact in the world, an aesthetic evaluation, or an expression of intention, desire, need, or the like?" This topic must always be key on the self-reflexive agenda of critical learning systems.

With these basic details of the critical learning subsystem in place, we can now return to the holon and its use in helping people in communities and organisations, to 'learn from the future'.

The four domains of inquiry in the Search Conference, it will be recalled, were: (i) into the nature of the environment with which the system of concern interacted, (ii) into the nature of the system of concern, (iii) into the impact of the environment on the system, and (iv) into the system's potential to influence its environment. While the analysis within these four domains drew very significantly on present and past circumstances, the impetus for their entire exercise was towards

the future. If people within organisations and communities (a) had a clear idea of what it was that they really wanted to achieve collectively by some future date (their ideal), (b) as clear an idea of the 'environmental forces' (the causal texture) that could either inhibit or facilitate that ambition, and (c) a clear idea of their potential to influence those forces, they could design strategies that would help them get to where they were aiming to go. To an observer, this was equivalent to a system attempting to co-adapt to the environment about it – co-develop with it, if you will.

The Hawkesbury approach to future development is somewhat different to this. In the first place, as elaborated above, we have added the third dimension of the critical learning subsystem, to indicate that it is groups of learners, as 'agents' within organisations and communities that have to 'bring' their systems and suprasystems into existence. To be able to do this, they need to have acquired sufficient self-reflective and adaptive skills to be able to access and adapt the epistemic positions they hold. Without a sufficient 'level' of epistemic development, they will unlikely be able to develop adequate systemic capabilities. Their first skill as systemic thinkers and practitioners is to bring themselves into being as a critical learning system (CLS).

With appropriate systemic capabilities, the CLS can now address the identity and nature of the organisational system of which they part – recognising that it is they who are bringing it into existence, rather than some objective observer. And the same relates to the environmental suprasystem. This is not to state that there is no objective reality 'out there', either in the form of a 'real' organisation, or 'real' bio-physical or socio-cultural environments in which it must operate. Rather, it is to appreciate that we cannot directly access them. Thus all 'objective realities' are functions of 'subjective' or 'contextual' interpretations, and that includes the systems that we 'observe' in nature and society. They are but constructs; conceptual models that we attribute to 'reality' rather than actual representations of it.

This ability to imagine reality into existence is time independent. In other words we are just as able to create a future reality as we are one for the present for now, or for the past. And it is this capability for imagination which, when qualified both by reason and normative insights, allows us to 'create', 'experience', and 'learn from', the future.

Let us assume that the senior management of a particular commercial organisation wants to improve their strategic capacities to help them help their company to adapt to (co-adapt with) the increasingly turbulent environments in which they perceive it to be operating. A systemic development practitioner is contacted and the following process is initiated (no attempt will be made to put any structural details into the account here – although the Hawkesbury team have considerable experience with the design and conduct of practical programs).

- A number of participatively democratic groups are established across the company, and encouraged to be self-organising.

- They are encouraged to design their activities around the principles of 'critical learning systems', and to behave in a way that allows them to be critically self-reflective as well as effectively productive in their generation of meaning, judgement, and meaningfull actions.

- They are encouraged to recognise and to celebrate the multitude of variety that will exist among their membership – in the way learning occurs and across the spectrum of worldviews that will prevail. Tensions of difference will be recognised, celebrated, and amplified wherever appropriate, rather than attenuated as conflictual situations to be avoided.

- With suitable experience and appropriately critical self-reflection, they will achieve those stages of epistemic development that seem to them to be necessary for the acquisition of systemic capabilities.

- The CLSs are encouraged to explore the 'systemic nature' of the organisation of which they see themselves as a part – to bring the system into being as it were - and to investigate their own subsystemic relationship to the whole. Once the system is 'created', the CLSs are encouraged to explore its history, as well as its present state, and most significantly, what 'force field' might have been involved in 'shaping the system's evolutionary path.

- So they are encouraged to explore the 'systemic nature' of the environmental 'force field' with which their organisation is perceived to interact – to bring the suprasystem into being, as it were, and to explore the perceived embeddedness of the system within it. This 'analysis' will include an identification of both the bio-physical and socio-cultural 'fields' that are perceived to comprise the suprasystem, and to explore their historical and present form.

- The next step in the process is to 'imagine into being' a number of vitally different states that the suprasystem could plausibly assume in the future, given the analysis that has been done of the nature and dynamics of the 'fields' that comprise it, with appropriate allowance being made for the emergence of those unanticipated outcomes that will inevitably occur through the systemic interactions that are assumed.

- These 'imagined states' can be perceived to be so 'real', that they can be 'experienced', and thus learned from. It is not that difficult, moreover, to envisage aesthetic, ethical, and spiritual aspects of relevance to them, and inspirationally, we can learn from, and about these. We can learn from the future.

- It is vital throughout these stages of 'imagining into being' and creative analysis, that the CLSs continually engage in critical self-reflection and self-adaptation, allowing the requisite epistemological, ontological, and axiological variety to be utilised as creatively as possible. There is nothing more limiting to this process than the colonisation of the CLSs by singular worldviews.

- The penultimate step in the process involves the design of a range of strategies that are judged appropriate for the various plausible future scenarios that were earlier created. It is particularly important that the ten 'judgement criteria' of systemic development are used as the basic framework for evaluating these strategies. This means that the normative outcomes with respect to aesthetics, ethics, spirituality, cultural feasibility and ecological responsibility accessed through inspirational learning are as vital as the experientially derived rationalities with respect to the more instrumental aspects of development.

- And finally, and most significantly, the CLSs need to report upon three essential matters: (i) the details of the three of four statements of future states (of the suprasystem $L_{2\,2}$) developed as plausible scenario, and the logics that led to their development; (ii) the details of the strategic responses proposed as co-adaptations of the organisation or community (of the system $L_{1\,1}$); and the learning and personal development that has occurred as a function of these intiatives (of the critical learning subsystems $L_{0\,0}$ itself and of what 'it' has learned of the interactions $L_{1\,2}$ and $L_{2\,1}$, of $L_{1\,3}$ and $L_{3\,1}$, and of $L_{2\,3}$ and $L_{3\,2}$) .

This whole process of exploring the future, the holon in action as it were, can be powerfully envisaged as an all-encompassing learning mega-system, with each 'level' $L_{0\ 0}$, $L_{1\ 1}$, and $L_{2\ 2}$ continually informing the other. It is in this manner, for instance, that organisational systems 'learn how to adapt' today to deal with states of the suprasystems with which they might have to deal tomorrow. The system, through the critical activities of its learning subsystem, could also learn how to view the apparent turbulence of the environmental suprasystem from different perspectives – and indeed change them through changing the perspectives through which they 'see themselves'! In this manner, the 'field forces' of science and of neo-liberal capitalism can learn to become self-reflexive, and adapt themselves in order to reduce the negative impacts that they might be having on systems embedded within them. All through here, we are talking about perceptions which are not reflections of 'real things' but, as von Bertalanffy (1972) pointed out "interactions between the knower and the known, and thus dependent on a multiplicity of factors of a biological, psychological, cultural and linguistic nature."

It is through thinking and acting in these systemic terms, that we can come to learn about the risk society, and what might be done in terms of developing a more critically reflexive response to its challenges. Equally, it is through thinking and acting systemically that we can deal with the problematique of modern industrial society in ways which help us deal much more effectively with its innate complexity and chaotic tendencies. Through these approaches we learn to appreciate the nature of interrelationships, both in time as well as in space, and the significance of 'tensions of differences' as the source of energy of 'systems'.

Critical systemic development, in the sense elaborated here, allows us to deal collectively with the spiritual as well as the conceptual through discourse in learning systems that are replete with tensions of difference and requisite variety. It allows us to make ethically defensible judgements about what we *should* do next, rather than just the technically feasible decisions about what it is that we *could* do.

Walking our own Talk

The Centre for Systemic Development at the University of Western Sydney Hawkesbury was deliberated designed around critical learning system principles. The central design concept is that of an 'actively learning node' at the boundary between the university and communities and organisations beyond. The members of the Centre are committed to the creation of a critical learning system at this interface through their own experiential/inspirational involvement in projects with people in organisations and communities who have expressed interest in their own systemic development. Over the few short years of its existence, members, who include faculty members, graduate students, research fellows and associates, have built enviable sets of relationships with people in a number of organisations in both the public and private sectors within Australia, as well as with a number of rural communities. The aim here is to help in the creation and maintenance of 'critical learning systems' within these places, and indeed between them too, in true networking fashion. This networked system of interactions is also beginning to extend overseas, with involvement currently in systemic development activities in projects in Papua New Guinea, South Africa, Nepal, Vietnam, Romania, and the United States of America. Some of the action research projects of the graduate students are also being conducted in foreign lands including Sri Lanka, Burkina Faso, and Nepal. Formal planning or designing for the future is rarely the central focus in any of these initiatives, although the future is certainly a pervasive context for all systemic development work by the very nature of the development process.

In addition to this actual involvement in the development of critical learning systems in practice, as it were, Centre members are also committed to the further development of the principles which

inform the endeavour. Three major lines of scholarship that are currently being pursued in this context involve theoretical and/or philosophical exploration into autopoeisis, chaos and complexity, and ethics. It is through this combination of practice and theory that the Centre members are learning to walk their talk, while further developing the talk and ways of talking (and walking) as they go!

While it is far too early yet to make any definitive statements about the outcomes of these Hawkesbury initiatives, there is already some evidence, both anecdotal and empirical, to suggest that the critical learning systems approach does lead to very significant learning, and to both personal and organisational development. Over upcoming years, as we continue to elaborate our approach, it is our intention to more formally evaluate and record our endeavours.

End Note

Fred Emery committed a very significant proportion of his professional life to the three matters highlighted in this brief oration dedicated to his memory: systems thinking, organisational development, and learning. The foundations that he, along with a variety of colleagues laid, have been very influential on many of us, disagree though we may with some of the details of his propositions.

Certainly I am among those who would be the first to admit my acknowledgement to him as an important influence in my own thinking and practice, and it has indeed been a privilege to use this occasion to pay a tribute to him and his work.

Those with systemic capabilities should not shirk from the challenge of further facilitating systems thinking, systems practices, and systemic development through arranging ourselves as self-organising, 'future oriented', critical learning systems, and encouraging others, wherever and whenever possible to do the same.

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