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## REQUISITE META-REFLECTION ON ENGAGEMENT IN SYSTEMIC CHANGE? FIAT, FATWA AND WORLD-MAKING IN A PERIOD OF EXISTENTIAL RADICALISATION



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*and on the implications of the development of the network of international organizations, especially in terms of the future challenges to knowledge dissemination, visualization of knowledge structures, and the design of organizational forms more appropriate to the complexity of the network of world problems. A particular concern continues to be the use of metaphor in reframing policy-making dilemmas in response to world problems.*

framing matters otherwise – “seeing it so”, if only as an individual act of imagination. The feasibility is indicated by the use of fiat by conventional authority, as in quantitative easing, and the use of religiously inspired fatwas or their equivalents. Within academia the process may take the form of elaboration of a model. Together these are considered here as variants of world-making. Their credibility and viability becomes increasingly evident under the current conditions of existential radicalisation.

### TOWARDS A SELF-REFLEXIVE FOCUS

The question addressed in what follows is whether and how a sharper and more fruitful focus could be given to systemic change — with far more attention to appropriate self-reflexivity, corresponding to higher orders of cybernetics, especially beyond the preoccupations of the first order. A lead into the matter can be offered by using the pattern of WH-questions to challenge the terms of the title above: *Requisite Meta-reflection on Engagement in Systemic Change?*

“Requisite” for whom, given the variety of analytical preferences and models? What is to be usefully meant by abstruse “meta-reflection” at a time when many are in desperate quest for a minimal standard of living in challenging environmental conditions? How is “engagement” to be understood and undertaken, given preferences ranging from business-as-usual, through glocalism, to jihad? Again, given such a range of worldviews, which “system” is it appropriate to endeavour to change? Potentially more to the point, why is any effort to “change” desirable when its unpredictable consequences may be as disaster-prone as the current situation? Necessary change, from a Gaian perspective, may even occur in ways beyond conventional comprehension. Reference to “requisite” is appropriate in this context in recognition of the cybernetic law of requisite variety in governing any system.

Omitted from this set of WH-questions are the other two, namely where and when change is to be considered necessary. In the quest for a greater degree of focus, the title is itself framed as a question, implying the fruitful possibility of a “deadly question” through which change might be catalyzed.

### INTRODUCTION

**T**HE PAST DECADES HAVE SEEN MUCH FRUITFUL reflection on systemic change, most notably in response to calls for action in the face of emerging crises. Numerous initiatives have been variously proposed and undertaken.

There is however a case for framing this in terms of a suitable adaptation of the title of a work, now “old”, by James Hillman and Michael Ventura: *“We’ve Had a Hundred Years of Psychotherapy – And the World’s Getting Worse”*.

Of course a feature of the systemic condition (and the remedies in play) is that there is a spectrum of views on the matter, and many would prefer to claim that the “world’s getting better”. Such differences are characteristic of the increasingly sterile debate regarding the need to be “positive” versus the preoccupation of critics readily deprecated as “negative” – otherwise to be termed as “hope-mongering” versus “doom-mongering”.

One articulation of this dynamic is offered by Barbara Ehrenreich in *Smile or Die: how positive thinking fooled America and the World*. In cybernetic terms it can be framed as the need for more appropriate understanding of the interaction between positive feedback and negative feedback.

The argument here focuses on the relatively unexplored opportunity for system change through

The emergence of movements of opinion in reaction to perceived inadequacies may well be closely associated with a variety of forms of change. This is evident in the case of human rights, environmental preoccupations, and in response to those in need. These may well be associated with political movements seeking a degree of revolution in the political order and with efforts to institute an equitable pattern of international law. International agencies, notably the Specialized Agencies of the United Nations, can be understood as agents of change in this sense.

Clearly other international actors can be seen in this way, notably in the light of the dynamics between the ideologies they represent, as in the case of the World Economic Forum and the World Social Forum. The former notably claims its intention “to make the world a better place”. This is despite the manner in which this self-appreciative strategy is challenged by the latter, itself deprecated in turn by the former. Arguably there is a need for a systemic framework capable of encompassing such dynamics, as speculatively suggested in terms of an aesthetic metaphor.

The argument here therefore focuses on other “agencies” whose modalities can be usefully considered as driving and framing such initiatives. These are religion, academia and the military. It is within each of these arenas that the framing of the problematic dynamics between contrasting perspectives is especially evident. Whether it be religions, academic disciplines or opposing armies, each has fundamental differences with others of its ilk. As most briefly put, it is a case of *we are right, you are wrong*. Desirable systemic change is envisaged in terms of “*if only you would agree with us, all would be well*”. In terms of a Christian metaphor: *Let us all sing the same song* – and from the same hymn sheet.

So framed, systemic issues and crises arise – and are perpetuated – only from failure of all to agree in some way. None of the three agencies has demonstrated a high degree of competence in handling disagreement fruitfully. However all pride themselves as being agencies of desirable change, as they respectively understand it. For religions, those holding alternative worldviews may be targeted – possibly to the point of their elimination. A similar view is characteristic of the fundamental modality of the military – surrender or else “*we may bomb you back to the Stone Age*”. The natural sciences might be understood as having a corresponding view of the social sciences.

The argument can be further developed by focusing on “science” understood most generally as a consciously disciplined mode of knowing. Curiously both religions and the military can also be explored in these terms – whether as theology or military science. The first may be framed as knowing divinity and the latter as knowing one’s enemy. Religion of course frames its enemies as diabolic. In less charged terms, all three are fundamentally opposed to ignorance – effectively to nescience.

The question here is which of the three currently has the potential to engender greater insight into system change and transformation. Clearly the military have a simple answer to the question but significantly fail to derive subtler and more fruitful insights from the traditions of the martial arts, for example, as most notably articulated in the East. Religions have long demonstrated their limitations, currently illustrated by the failure of interfaith discourse or the capacity to engage meaningfully with any fundamentalism by which believers may be variously attracted.

It is therefore the range of academic disciplines, which merits particular attention as a potential source of insight into systemic change and the challenges to it. The matter is well framed by the fact that each discipline defines a field with which it is especially preoccupied. This may be such as explicitly to exclude the preoccupations of other disciplines as being misguided or inferior in some way — or simply irrelevant. Issues relating to the “pecking order” of disciplines have long been recognized.

The situation has been usefully illustrated by the so-called Sokal Affair in which the views which fail to accord with those of a particular discipline are framed as “nonsense”. Nicholas Rescher is explicit in his articulation of the challenge in *The Strife of Systems: an essay on the grounds and implications of philosophical diversity*:

For centuries, most philosophers who have reflected on the matter have been intimidated by the strife of systems. But the time has come to put this behind us — not the strife, that is, which is ineliminable, but the felt need to somehow end it rather than simply accept it and take it in stride.

The problematic dynamics extend, more unfortunately, into the relations between those promoting contrasting theories, models and “schools of thought” within any one discipline. As with the relation between the disciplines of academia more generally, there is very little capacity to engender more sophisticated frameworks

through which to articulate these dynamics. Academia therefore serves as its own metaphor of fundamental failure to engage more appropriately with systemic change – and of the justification for not doing so. The pattern is however applicable to change agents more generally and exemplified by the widespread blaming of “others” for crises, whether existing, emergent or anticipated.

The challenge has been usefully identified for other purposes by Edward de Bono (1992). The systemic implications are systematically neglected. As might be expected, any such conclusion is of course vigorously denied as meaningless by academia. There is a complacent sense of business-as-usual in the unquestionable advancement of human knowledge enabled by science – with the potential rewards of intellectual property, tenure, awards, and the like, along a well-trodden career path. Together with the “publish or perish” syndrome, this strangely echoes the pattern promoted by religion with respect to heavenly reward after death.

#### SYSTEMIC NEGLECT BY SCIENCE

The question of concern here is whether science as practiced is adequately attentive to the current limitations of its own processes and priorities. This can be explored at greater length in relation to various kinds of criticism. It can be argued that science frames its mandate to focus on easier problems, avoiding the “wicked problems” which are a greater challenge and may be of more immediate relevance to a civilization in crisis. There is a sense in which the achievements which are of popular appeal – going to Mars – are publicised to disguise the systemic issues which science inadvertently neglects, of which mass immigration into Europe is but one example.

Other examples include the dynamics relating to disagreement in the face of seemingly naive appeals for consensus. This applies as much to relations between the disciplines as to issues like climate change, and yet does not give rise to argument mapping of a sophistication matching the articulation and dynamics of incommensurable perspectives. It is notably evident in the case of issues associated with overpopulation and its consequences, and with the curious neglect of the dynamics driving unconstrained reproduction.

Whilst unblushingly complicit in the development of weapons of mass destruction, and in technologies endangering the environment (“scientific whaling”, fracking, etc), there is a remarkable lack of capacity to address systemic issues of the governance of such undertakings – understood

in cybernetic terms. Avoidance of responsibility through gerrymandering is the rule rather than the exception. This is evident in the lack of simulation of options for better oversight of complex processes, most notably as a consequence of the development of sophisticated surveillance technologies.

The concern here is not to develop such points, nor to relate them to so-called Science 2.0, as a suggested new approach to science that uses the information-sharing and collaboration made possible by network technologies. The concern is rather to draw attention to a peculiar form of uncritical complacency in undertaking science. This could be explored in terms of a form of confirmation bias reminiscent of that of religion – potentially also to be understood as a pattern “conformation bias” reinforced by the peer review process.

This possibility raises the pertinent question as to whether what is rendering science less “fit for purpose” – in a civilization faced with a crisis of crises – is the failure to apply the emerging insights of science to the scientific method itself. Such failure would mark science as fundamentally non-self-reflexive. A potentially interesting example of this would be whether the manner in which mathematics is organized to encourage comprehension of its riches, reflecting the remarkable insights of that discipline, most notably with respect to symmetry group theory.

#### MUTUAL EMBEDDING OF DISPARATE COGNITIVE MODALITIES

The issue can be presented otherwise by exploration of the pattern of organizational correspondences between science, religion and the military. Necessarily provocative, any such mapping would highlight problematic similarities between mindsets which consider themselves variously unquestionable. Has science effectively taken on the trappings of religion despite seeking to displace it? To what extent does each constitute a particular modality of collective learning — or of learning aversion?

Potentially even greater insight could be derived from understanding the degree of embedding of each of the three cognitive-behavioral modalities in the other:

- RELIGION ∞ MILITARY: the embedding of the military modality in religion is evident in such cases as the Christian Church Militant (*Ecclesia Militans*) and Islamic *jihad*. The former notably empowers crusades, as now more frequently undertaken in metaphorical terms. The reverse embedding is evident in anecdotal accounts of individuals framing their military engagement in religious terms, clearly reinforced by deliberate religious endorsement of military activity. Both are evident in the articulation of just war theory.

- **MILITARY ∞ SCIENCE:** the recognized discipline of military science is the study of military processes, institutions, and behaviour, along with the study of warfare, and the theory and application of organized coercive force. There is a long tradition, of which Leonardo da Vinci was one exponent, of weapons science (and technology), namely the application of science to the design of military hardware.
- **SCIENCE ∞ RELIGION:** theology can be understood as religious science, or the science of religion. Of particular relevance in a period of religiously inspired conflict is the potential interweaving of mathematics and theology. This could constitute a bridging modality of a subtlety and sophistication appropriate to the two seemingly incommensurable modalities and the manner of their organization. Mathematics may eventually prove to be the most sophisticated articulation of religious belief, as suggested by Sarah Voss in *What Number Is God? Metaphors, Metaphysics, Metamathematics, and the Nature of Things*.

Given the cognitive richness of the patterns of quantum mechanics, could this mutual embedding be explored in terms of entanglement and mirroring?

Especially intriguing is the manner in which each such modality arrogates authority to itself and to its declarations of truth – as to what is “right” and what is “wrong”. However each also eludes any institutional framing with which responsibility might be associated in legal or ethical terms. Each can be explored as an imaginative fantasy. This itself clearly engenders difficulties in a complex society characterized by a multiplicity of variously incommensurable perspectives. Is the elusive nature of the “international community” – as a focus for belief to which appeals are now desperately made – increasingly resembling the traditional relationship to divinity, however defined?

#### SYSTEMIC CHANGE BY AUTHORITATIVE FIAT

It is curious to note the extent to which preoccupation with systemic change frames both system and change as objective externalities, typically distant and dissociated from any commentators and the authorities to which they are beholden. Hence the ease with which the matter is misleadingly presented in terms of the need for others to change, together with their institutions and their mindsets. Much effort is devoted by groups to achieving this transformation of other groups in the global system – or blaming them for failing to act appropriately, however that is defined.

A different understanding is evident in the grassroots focus on local change as potentially enabling

global change – irrespective of whether this is otherwise considered to be feasible or meaningful. The arguments of John Michael Greer are noteworthy in this respect. When espoused by an individual, this strategy may be widely framed by the Gandhian slogan: *Be the change that you wish to see in the world*.

Curiously little is said regarding a further opportunity of which there are a variety of indications as to its feasibility. One such is evident with respect to currency and finance, namely fiat money. This is currency which derives its value from government regulation or law — unsupported by any other value. A striking example is offered in 2015 by the European Central Bank. Previously deprecated as “printing money” and an indication of incompetent governance, this has now become an accepted global strategy as so-called quantitative easing. An equivalent of relevance can be recognized as a form of “qualitative easing” indicative of a wider spectrum of previously questionable strategies that are increasingly becoming acceptable.

Another example is offered by the manner in which the boundaries of countries have been defined, most notably on the termination of conflict, as with the Treaty of Versailles. The recognition of “spheres of influence” by the Yalta Conference or the Monroe Doctrine is of a similar nature. These exercises have frequently taken little account of cultural or traditional boundaries of the inhabitants of those lands (as with those defined by colonial policies) – or the conflicts artificial boundaries may subsequently engender.

A similar approach is recognizable in the boundaries between disciplines. The pattern is also evident in the manner in which complex issues, most notably wicked problems, are arbitrarily defined in relation to the mandates of agencies. The most striking examples of fiat are of course offered by the formal categorisation of people, as by the Nazi and Apartheid regimes. Potentially more insidious is the use of injunctions, namely court orders compelling a party to do or refrain from specific acts – now extended into superinjunctions preventing publication of the matter in issue or reporting of the fact that the injunction exists at all.

Controversially there is of course a case for exploring the role of fatwa in Islamic cultures as it relates to that of Western use of fiat. Both could also be explored in relation to “models” articulated within academia as a means of ordering reality and methods of engaging with it. As with orders and directives, these all share an arbitrary quality.



FIAT AND WORLD-MAKING AS  
AN INDIVIDUAL OPPORTUNITY

These examples can however be understood otherwise as being indicative of a means whereby individuals and groups can achieve systemic change and transformation by “seeing it so” – or “making it so” in military jargon – irrespective of views to the contrary or of making known their distinctive worldview. Variants of the process can be recognized in marketing concerns with achieving “buy in”, usefully explored as a form of investment. Beyond the preoccupations of secrecy by authority, this points to the possibility that the viability of civilization may be curiously dependent on individual silence.

The opportunity is perhaps epitomised by the phrase *Eppur si muove* (*And yet it moves*) attributed to the Italian mathematician, physicist and philosopher Galileo Galilei, after being forced formally to recant his claims that the Earth moves around the Sun rather than the converse (as declared by fiat by Catholic authority). Articulation of any model by an individual can be seen in this light.

The poorly explored opportunity for systemic change is therefore to imagine the situation otherwise, “connecting the dots” of observation such as to form a different and more fruitful pattern. A reminder of this possibility was offered on the cover of the *Last Whole Earth Catalog* (1974): *We can't put it together; it is together*. The possibility is otherwise understood by the phrasing of the title of a book by physicist Stephen Hawking: *The Dreams That Stuff Is Made Of: the most astounding papers of quantum physics – and how they shook the scientific world*.

This alternative possibility can be argued more extensively in relation to current strategic frameworks. The latter took the form of a review of a report to the Club of Rome: *2052: A global forecast for the next forty year* (Randers, 2012). This is seemingly one of several initiatives using a suspiciously distant time as a focus, including: *Global Europe 2050* of the European Commission; *Vision 2050: new agenda for business* of the World Business Council for Sustainable Development. The focus is challenged by one critic as avoiding consideration of the earlier commitment to the UN Millennium Development Goals for 2015 (Seaman, 2012). These were reframed in 2013 by a Post-2015 Development Agenda.

Repeated displacement of strategic focus to a somewhat mythical future contrasts curiously with the political focus on the immediate present and its reframing through the next press release. In that sense there is indeed a concern by authority to revision the present imaginatively – if cynically, whilst avoiding longer-term concerns or the

present consequences of those of the past. The pattern of strategic envisioning by authority over past decades could be usefully compared to the confidence trickery characteristic of *Find the Lady* at any fair ground. “*Find the strategy*”? The present can however be re-imagined more radically and effectively by the individual.

Dependence on such processes to avoid civilizational collapse recalls the classic tale of the prisoner condemned to death by a king. Following a proposal by the prisoner to the king, the execution was postponed whilst the prisoner taught his horse to talk. When this incredible proposal was queried by a fellow prisoner, the proposer indicated that it was a simple matter: *The king might die, I might die, or the horse might learn to talk. However, in the meantime I remain alive*.

Given the ready use of fiat by authority, there is then a case for recognizing the alternative interpretation that can be drawn from the much-cited remark by Abraham Lincoln: *You can fool all the people some of the time, and some of the people all the time, but you cannot fool all the people all the time*. Given claims by authority variously to represent the individual, there is a case for exploring the manner in which confidence in such authoritative representation could be “withheld” by the individual in some way. This could be understood as a further stage in the current systematic erosion of popular trust — one form of radicalisation. Assertion of authority can no longer be assumed to be viable as an unquestionable focus for belief. Seeing things otherwise is arguably the essence of non-violent system change.

It is especially appropriate to recognize the manner in which the language of systemic externalities mirrors that of existential experience – seemingly inadvertently – most notably with respect to depression and inflation. This echoes the contrasting tendencies to doom-mongering and hope-mongering.

SELF-REFLEXIVE DISCOURSE  
AS CATALYST FOR CHANGE

In a period in which mapping of the globe down to street level is accepted as normal, it is remarkable how little effort is made to map systematically the variety of interacting perspectives which characterize global civilization and its dynamics. This has been a goal of the *Encyclopedia of World Problems and Human Potential*. Despite investment and experiments to that end, this did not engender maps usefully supportive of discourse of a higher order. The situation remains one resembling that on the flat Earth of centuries past,

marked at the edges with *There Be Dragons*. As in that period, any detailed maps which exist may even be considered a secret asset.

Use of citation analysis could be considered an approach to such a mapping, although it necessarily avoids the isolated villages and hamlets of knowledge space in concentrating on its urban centres –avoiding the realms where dragons are held to dwell. Little use is made of social network analysis despite the technology now enabling it.

There is little reference to argument mapping or discourse analysis in relation to problematic strategic issues – most notably in plenary debate. One notable exception, suitably caricatured as the *Afghan Spaghetti Monster* for that reason, took the form of a systems map of actors in the Afghanistan arena. There is thus currently little effort to transcend the dynamics of *We are right; You are wrong*, as reinforced by the seating arrangements for opposing factions in such venues. Conferences are typically exercises in (self-) selectivity whereby the most primitive dynamics are ensured. These preclude the kinds of ecosystemic sensitivity now recognized as fundamental to understanding of biological systems. Are psychosocial systems assumed to be of lesser complexity than metabolic pathways?

In a period of rapid technological innovation, the innovation in meeting processes is in no way comparable – even when modest use is made of communication technologies. The unchanging pattern of keynote speakers, lectures/presentations, panels, Q-and-A, and workshops, cannot be said to reflect the rate of upgrading characteristic of information technology. It is remarkable the obligation to listen to a presentation *in extenso*, before being able to peruse an argument rapidly in some more convenient form – especially when no other format is available, or may only become so in the future and for a fee (“read my book”). The absence of active hyperlinks in academic journals is indicative of preference for an essentially obsolete mode of discourse via which systemic change is envisaged. Images are typically an embarrassment, especially given the issues of copyright. Metaphors may themselves become subject to copyright.

It is in this sense that strategic discourse, as enabled by academia, can be said to be “on repeat” – with every probability of little change anticipated by 2050 or 2100, whatever the risk of societal collapse. There is no Plan B. The argument can be extended to the environments in which strategic options are envisaged. Established comfort zones are in no way challenged – especially when challenging perspectives have been carefully designed out as irrelevant or “not even wrong”.

The challenge can be provocatively framed in terms of any encounter with extreme forms of otherness. Examples are offered by “talking with the Taliban” or “talking with ISIS”. Potentially even more challenging is the encounter with hypothetical extraterrestrial. Naively the latter are readily assumed to favour a mode of discourse consonant with that of academia — in contrast with the Taliban. It is remarkable that science has elaborated techniques for engaging with the dangers of radioactivity but has been unable to develop techniques for psychoactively dangerous discourse, as in the case of “hot issues”.

With the foreseen increase in use of intelligent agents in internet communications, other challenges are evident when an even more extensive array of messages – notably tweets – is generated by algorithms, as prefigured by algorithmic stock trading. Such developments of artificial intelligence, and its direct participation in strategic dialogue, will constitute a revolution in its own right, as separately explored. In the form of an array of tweets, rather than conventional phrasing, a question of interest is whether these would more readily pass the Turing test – and be unrecognizable as such, perhaps in preference to humans.

The rapid uptake of Twitter points to the possibility that strategic discourse may be rapidly transformed into a multiplicity of succinct tweets, hashtagged in support of a narrow band of interests and short attention span – both valued in support of the illusion of navigating information overload successfully. A key challenge may be the means of ensuring the emergence of patterns of global coherence from such communication dynamics.

Insights into more appropriate means of managing connectivity and disagreement are now suggested by exploration of higher orders of cybernetics (Yolles and Fink, 2015). The third and fourth orders notably take account of self-reflexivity – itself to be distinguished in varying degrees meriting exploration and recognition.

#### MNEMONIC CATALYSTS ENABLING SELF-REFLEXIVE DISCOURSE

Insights into degrees of self-reflexivity are clearly progressing with respect to systems control in the technical language of cybernetics. The question is how to articulate those learning pathways fruitfully – especially since the higher orders of cybernetics have an experiential dimension, as suggested by Douglas Hofstadter (2007).

Previous consideration was given to the distinction between uni-modal, bi-modal, tri-modal, and

quadri-modal discourse. A provisional approach is the identification of accessible metaphors which can serve as mnemonic catalysts to comprehension of discourse of a higher order and engagement in it. Examples might include:

- **AUTOMOBILE GEARS:** Given their familiarity, there is a case for considering the nature of the “conceptual gearbox” (as noted in that argument).
- **MULTI-STROKE ENGINES:** The well-recognized distinction between automobile engines (2-stroke, 4-stroke, 6-stroke, V6, V8, V12) suggests a means of articulating the relationship between successive “strokes” in any learning cycle.
- **OX-HERDING:** A valuable metaphor from Zen is expressed in a set of images relating to 10 stages of herding oxen – also known as the 10 bulls.
- **HATS AND SHOES:** Although focused primarily on the complementarity of different cognitive modalities, the many colour-coded metaphors extensively explored by Edward de Bono are potentially indicative of a means of identifying discourse of higher order.
- **POLYHEDRA:** Following traditional arguments, and those of R. Buckminster Fuller, the symmetrical Platonic and Archimedean polyhedra are suggestive of degrees of organization and interlocking of feedback loops.
- **PERIODIC TABLE:** The familiar organization of the periodic table of chemical elements suggests the possibility of its use to hold and distinguish different levels and styles of discourse

This disparate set of metaphors may be variously of value. However, given their nature, potentially more significant may be recognition of the extent to which the rich range of technologies – as externalities – may be mined as templates for more meaningful organization of collective discourse, following the arguments of Susantha Goonatilake (1999).

In the light of current explorations of biomimicry, this may be understood as technomimicry. Of particular relevance to systemic change is the challenge of designing and empowering strategies to “fly” (preferably like an eagle) – in contrast with the many that fail to “get off the ground” (typically compared with a turkey). This metaphor of sustainable flight can be explored in the light of the work of Arthur M. Young (1976).

#### ACHIEVING TRACTION THROUGH EMBODIMENT

Building on their above-mentioned consideration of higher orders of cybernetics, Maurice Yolles and Gerhard Fink (2015) subsequently consider the

nature of the ‘agency’ and its processes of change. They conclude:

‘Agency’ is a living system that is defined through a generic system hierarchy. This permits the development of higher order generic metasystems that create higher levels of collective consciousness. These see and explain reality in new ways, and through the associated network of processes that attach them to the other parts of the agency, establish new ways of dealing with reality. Establishing a superstructure, which may also be seen as a metasystemic approach to modelling, permits the incorporation of commensurable theory from other paradigms.

For the authors, an elaboration of this is that higher levels of agency consciousness can be generated through processes of internalization that can better deal with complexity. Agency has behaviour, which is determined by its structure as well as a transeunt capacity that explains how its cognitive structure shapes its behaviour. They note earlier work indicating that internalization is the transition in which external processes with external material objects are transformed into processes that take place mentally at the level of consciousness. During this transition these processes become generalised, verbalised, and abbreviated; importantly, they also become the means for further development and transcend what is possible with external activity.

This suggests a justification for exploring the manner in which identity – whether individual or collective – can be understood as emerging in the cyclic context of feedback loops of higher order. This would be consistent with the sense in which biological identity is sustained by a complex of interlocking metabolic pathways. An understanding of such subtle patterns is offered in poetic form through the psychiatric insight of R. D. Laing (1970). Recourse to poetry is consistent with the argument of biologist Gregory Bateson:

One reason why poetry is important for finding out about the world is because in poetry a set of relationships get mapped onto a level of diversity in us that we don’t ordinarily have access to. We bring it out in poetry. We can give to each other in poetry the access to a set of relationships in the other person and in the world that we’re not usually conscious of in ourselves. So we need poetry as knowledge about the world and about ourselves, because of this mapping from complexity to complexity. (Mary Catherine Bateson, *Our Own Metaphor*, 1972: 288-289).

The question from a strategic perspective is how such a higher order of internalized identity achieves traction in relation to externality. This can be variously explored in terms of experiential embodiment. This was notably a later preoccupation of Arthur Young, inspired by

the cognitive processes required to pilot a helicopter – in contrast to those required to drive a “tractor”.

A question for the future will be whether the scientific process of the present is recognized as essentially locked cybernetically in to what might be metaphorically named as “first gear” – a first order science, in anticipation of an “upgrade” (beyond Science 2.0) to forms of science capable of engaging with processes of higher order. These are increasingly intimated by some of the considerations of fundamental physics. This would be consistent with Einstein’s much-cited dictum: *The significant problems we face cannot be solved at the same level of thinking we were at when we created them.*



*Arguments in this article are amplified in a variant on the author’s website <<http://goo.gl/TKBwpf>> notably with links to related papers.*



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