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Harnessing Social Processes for the Common Good

ABSTRACT

This article argues that harnessing social processes for the common good depends on creating a *learning society* which will innovate, learn, and evolve in the long-term public interest. In essence, this involves establishing more embedded, interconnected, and interacting, "organic" feedback (sociocybernetic) loops which do not depend on long and distorting chains of "accountability" to distant "representative" assemblies of "decision takers". Several important steps toward doing this are discussed. However, all depend on undertaking a great deal of adventurous, problem-driven (as distinct from literature-driven) research. By far the most important of these research programmes would be to develop a better understanding of the currently invisible (Kafkaesque) network of social forces that have the future of our species and the planet in their grip … and then to find ways of intervening in that network. It is suggested that this is analogous to Newton first conceptualising physical forces and then showing how to measure, map, and harness them. Answering the question of how work like Newton's could be funded and conducted in modern society – and especially under current research-funding arrangements – thus emerges as crucial to finding a way forward.

KEYWORDS: common good; sociocybernetics; learning society.

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Many people have noticed that well-intentioned social policies, whether at local, state, or international level, have a disconcerting habit of delivering the opposite of what was intended[1]. More seriously, they often result in activities which, while failing to deliver the desired improvements in quality of life or the reduction of inequalities within and between societies, end up, through their destruction of our habitat, heading our species toward extinction at an ever-increasing rate (Raven, 2014).

There are widespread calls for change. Thousands of people turn up for the conferences like those of the World and European Social Forums.

Thus, when the G8, the policies of which are widely blamed for many of our problems, met in Scotland, we set about organising a parallel "Alternative G8" conference.

What happened was that we got hundreds of articulate speakers highlighting one or other of the many things that are wrong with modern society and which therefore seemed to indicate a need for changes in policy. The problems ranged from gross abuses of civil rights, mass starvation due to climate change combined with inappropriate economic policies (often presented as being intended to deal with it), and the impoverishment of countries due to "structural adjustment" programmes.

Most of the speakers called on their governments or the G8 to fix these things on a one-by-one basis. The implication was that, if they were fixed, we could continue living pretty much as we do right now. But this is simply not possible if we are to survive as a species.

Among other things, it would require 5 back-up planets engaged in nothing but agriculture for everyone in the world to live as we in the West do now (Rees, 1992).

[1] See Raven (1997b) for a fuller discussion.

No-one addressed the question of what an alternative world-management system – an "an alternative G8" – which would be more likely to act *in the long-term public interest* – would look like.

I say "look like" because one of the key things we need if we are to move forward is some kind of shared *feel for* – or image of – the processes are needed to guide us toward the *evolution of* new public management arrangements.

I use the words "feel for" because the word "image of" is too strong: There cannot be any kind of blueprint of the kind of society we need … only a kind of feel for the sorts of thing we might need to do to move forward.

To be sustainable, our society will need to differ from the kind of society we have at present as much as agricultural society differed from the hunter-gatherer society. And, just as no one in a hunter-gatherer society could envisage what an agricultural society would look like, so no one in our society can envisage what a sustainable society will look like.

However, there are two things that *can* be said.

One is that the hazy vision which guides our actions must recognise the need for a *dynamic, self-monitoring,* ***evolutionary*** process.

The other is that that kind of hazy image must incorporate a feel for the need for an *organic* monitoring and feedback process.

Organic systems – such as those that control the operation of the human body and those of other animals – have multiple, interacting, non-hierarchically organised, feedback loops. In the context of the whole, very little is organised via any kind of central organ such as a brain. And even the brain-nervous-system-system is dependent on millions of interacting experimenting and learning loops. What is more, these organic cybernetic systems are *an integral part of the organism,* not something kind of external to it in the sense in which societal governance systems are, in some sense, added to an already functioning system.

Unfortunately, the very way we have framed our question about how an alternative society might be organised prompts answers couched in terms like "management" and "governance" – terms which, given our cultural preoccupation with power and hierarchy, recursively reinforce our tendency to think in hierarchical terms.

TOWARD A WAY FORWARD: CYBERNETICS AND SOCIOCYBERNETICS

At this point I have to say something about the terms *cybernetics* and s*ociocybernetics*. Cybernetics is concerned with the study of guidance and control systems in animals and machines – and the design of better ones. One has to mention of the animals, otherwise people think only of man-made systems, like missiles. But as soon as one includes animals in the definition it is clear that cybernetics is concerned with understanding guidance systems which depend, as we have noted, on multiple, non-hierarchical, feedback loops.

This context makes it clear that the sub-domain of *socio*cybernetics is concerned with both understanding the social forces which control the behaviour of people in society and designing better sociocybernetic – viz. guidance (management) – systems for running society.

Unfortunately, most people would not even recognise a society "managed by" (i.e. dependent on and incorporating) a sociocybernetic system paralleling the organic cybernetic (guidance and control) systems of animals as having a *governance* system at all! They would not even think that such a system was *possible*. *Yet, ironically, this is just what we do have!*

The formal governance system we all talk about is some kind of epiphenomenon – it is *not* what governs the way our society operates!

We are at the mercy of a network of social forces we do not understand. We find ourselves in a Kafkaesque situation in which we feel we are somehow pushed into all sorts of activities "against our wills" and which we know to be wrong. These include such things as purchasing commodities which add little to our quality of life and the production and distribution of which we know to be not only socially harmful (in that it creates deep divisions between the rich and the poor) but is actually destroying our habitat and thus our chances of surviving as a species. It pushes us into frenetically slaving away at what we know to be at the largely meaningless jobs required to secure our position in society (Bookchin, 1991; Graeber 2013; 2014), contributing to, and participating in, an "educational" system which we know is not really about development and is in many ways harmful[2], acquiescing in, or to actively contributing to, the destruction of professionionalism by manualisation[3], and "trade" activities which involve the transpor-

[2] Especially by contributing to, legitimising, and cementing hierarchy and social division (see Raven, 1994).

[3] This refers to the process whereby the professionalism of doctors, teachers, social workers, road maintenance personnel, and now even parents is undermined by endless prescriptions generated by bureaucrats and incorporated into *Manuals* specifying what these professional personnel should do in every conceivable circumstance and associated with huge legal penalties for failing to comply. Thus teachers are confronted by specifications for what they should do in every 10 minutes of the day and requirements that, each evening, they complete detailed tick-box assessments to show they have done what they are supposed to have done and are eventually checked up on via multiple-choice based testing of their pupils – and deemed to be "failing teachers (and schools) if the latter do poorly on those tests … tests which are norm-referenced tests and thus designed via the statistical assumptions built into their construction to ensure that 50% fail. Social workers are confronted by a 600-page Manual of prescriptions for what to do in every circumstance conceivable to bureaucrats and now spend more than 60% of their time in front of their computers searching for such prescriptions instead of considering the idiosyncratic needs and circumstances of their clients. Parents are checked up on via endless visits from social workers clutching 60-page booklets requiring hundreds of tick-box assessments to confirm that parents are following centrally prescribed proce-

tation of vast quantities of almost identical products and materials in opposite directions around the globe despite the fact that we are clearly able to see that this unnecessary activity is going to destroy our planet (Raven, 1995). Despairing of being able to see any way of doing anything about any of these issues ourselves (often because we can see that they require system change) we shout at politicians whilst knowing full well that, despite their promises, they are as unable as we are to do anything significant about them.

In our everyday conversations we tend to pick out bits of the system (such as "decision takers", "leaders", "stake holders", "capitalists", "public servants", "bankers"), conceptualise them in inappropriate ways, force them into our hierarchical model, and offer endless off-the-cuff opinions (in pub talk and via the social media) as to how they should be fixed[4].

ONE MORE STEP

So our task here in this article has to be to help us step back from these "common sense" discussions and ask how to design a more organic public management system … or, more accurate-

dures. Doctors are required to follow specific procedures in all circumstances … procedures which largely result in drugs-based treatments rather than changes in the environmental constraints on their clients' behaviour. Service personnel such as hole-diggers, plumbers, and electricians are required to follow endless courses to familiarise them with never-ending – and continuously changing – regulations (often having to do with "health and safety") – and demonstrate that they know about these regulations.

[4] An alarming number of these are themselves couched in non-systemic, essentially fascist, terms which reveal the willingness of the individual concerned to impose what he or she believes to be good and right on others by force and without regard for the multiple, and generally unanticipated, consequences of the action (see Raven, 2016).

ly,… a *learning society* … which will innovate, learn, and evolve in the long-term public interest without central direction.

We are not the first to have asked this question.

Very many people have noted the inadequacies of centralised governance. In the 18th and 19th centuries Adam Smith and John Stuart Mill described central government as governance by "committees of ignoramuses" who knew very little about the issues about which they were taking decisions and were largely insulated from any kind of meaningful feedback.

At much the same time, many of the American Founding Fathers[5] underlined the inadequacies of most popular interpretations of "democracy".

Adam Smith proposed to overcome these problems via "the market mechanism".

Unfortunately, not only do very few people understand how this is meant to operate, the very image of the process itself has, by and large, been corrupted in such a way as to convey precisely the opposite of what was intended.

For a start, the market mechanism was *not* about making money!

It was nothing less than a design for an information-harnessing and empowerment system which would operate without centralised decision takers.

Smith began by making the, on the face of it, absurd, observation that there can be no such thing as a wise man or woman!

But that conclusion in fact follows from the fact that, if someone initiates some activity at one location and someone else another activity at another location, no-one can tell in advance what will happen when the two sets of developments come together. In reality, this process regularly results in unpredictable, previously unimaginable, outcomes!

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[5] See, e.g., http://www.whatourforefathersthought.com/DemoRep.html

In other words, the key information required to take wise decisions not only is not, but *cannot be,* available.

Smith's proposal, if it worked, would not only enable us to overcome this problem but even provide a way to harness the expert information located in the hearts, heads, and hands of the billions of people who inhabit the planet**.**

It is important to include information in peoples' "hearts" and "hands" as well as their "heads" because most information is unverbalised, being feeling-based (as in most skills and, indeed, intellectual activity). It is *tacit* knowledge, i.e. unverbalised knowledge of *ways of doing things* as distinct from formalised "intellectual" knowledge.

Through the market process, people could use their money to express their personal preferences; they did not have to abide by the tyranny of the majority or the whims controlling elite. They could influence the direction of experimentation and development. They could vote separately on thousands of issues as they purchased goods and services. Regardless of what anyone else did or thought, they could invest in enterprises they liked. They did not have to verbalise the reasons for their choices. They did not have to choose between politicians (whom they did not trust) offering only alternative *packages* of policies (some of which might be desirable and others not with many imposed on a mandatory 'one way for all' basis) and largely unresponsive to feedback. The decisions *made by the system* would change over time as things developed. Formulated in the terms I am using here, the proposal was for an *organic,* experimentation-and-learning, system with multiple feedback loops which did not depend on decisions by distant committees of ignoramuses unaware of most of the most crucial and relevant information.

For a variety of reasons (Raven, 1995)[6], perhaps the most important of which are its inability to take account of the long-term

[6] These are spelt out in my *New Wealth of Nations*.

effects of actions which have marked implications for the survival of the planet and inability to commoditise and exchange the most important contributors to quality of life, the market mechanism does not and cannot work.

So the problem we have set out to address here is still with us. The need is nothing less than to evolve a *learning society* … a society which will harness the huge variety of human knowledge and competence, including emotional feelings and knowledge of ways of doing things, and change as new interactions and "knowledge" emerge. Most importantly a society which will innovate and learn in the *long-term* public interest instead of the short-term interest of dominators.

TOWARD AN ALTERNATIVE VISION

We may begin our quest for a way forward by summarising some research we carried out in connection with the "educational" system over the past half century (Raven, 1994).

A number of opinion surveys were carried out among parents, pupils, teachers, 20-30 year old ex-pupils, and employers in many countries. It emerged that the overwhelming majority of those asked thought that the main goals of education are to nurture qualities like "the confidence and initiative required to introduce change" (actually, the most widely endorsed goal among our adolescent pupils), problem-solving ability, the ability to work with others, the ability to make one's own observations, the ability to communicate, leadership ability, and the ability to understand how organisations and society work and play an active part in them. More generally, and importantly, they included helping people to develop, and get recognition for, the diverse, often idiosyncratic, talents they possess.

The objectives said to be very important did include helping people to acquire the credentials that appear to control entry to

jobs. But the significance to be attached to this has to be tempered by the fact that it was widely recognised that the formal knowledge on which such certificates are based is, in reality, *un*-important. It is out of date when it is taught, quickly forgotten, and does not relate to their needs.

We confirmed the accuracy of these opinions through studies of competence in the workplace (Raven, 1994; Raven & Stephenson, 2001).

Yet, despite their acknowledged importance, few schools pay much attention to these wider character/talent-development goals, concentrating, instead, on helping pupils to gain certificates based on the ability to regurgitate temporary knowledge[7] of-out-of date information which is generally unrelated to their life or employment needs.

The quest to understand the reasons why schools generally neglect what are perceived to be their main goals and focus on what is seen to be the educationally less important goal of acquiring certificates … and what needs to be done to generate more appropriate arrangements provides the basis for much of what will be said in the remainder of this paper.

Of course, many readers may feel that the answer is as obvious as the answer to the question of why the sun moves around the earth. And, in a sense, indeed it is. For what the data are saying is that schools concentrate on the *sociological* function of allocating social position and largely ignore their manifest *educational* goals. The benefits of the sociological outcomes are much more *visible.*

But the answer to the question of why that should be so is actually not at all obvious. Indeed, the quest to answer it will take us deeply into asking why our society is so pre-occupied with legitimising and promoting hierarchy – viz. social division.

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[7] Formal knowledge has a half-life of a year, i.e. people have forgotten 50% after 1 year, 75% after 2, 82.5% after 3 … and so on.

We do not *need* to be so preoccupied with material possessions, power, and status.

Barriers to the Development of an Effective Education System and a Preliminary Discussion of the Management and Organisational Issues Involved

The reasons why schools tend to neglect their main goals include the absence of a shared, formal, understanding of how to nurture the desired qualities and how to find out whether one has done so, and, more specifically, how to recognise and nurture the huge variety of talents which are to be found in every school classroom. But they also include an inability to handle the value conflicts which surface as soon as one tries to introduce educational programmes which actually set out to nurture high-level competencies or promote diversity.

Many parents simply do not want their children asking more questions or developing competencies which, they believe, will lead their children to "put on airs" or grow away from them.

So far as I can see, handling these values conflicts involves the creation of a variety of distinctively different educational programmes which actually do (as distinct from merely promise to) nurture different talents, documenting the differential consequences of these in a *comprehensive* way, and feeding that information to the public so that they can make informed choices between them. This stands in stark contrast to the notion that (very limited) information deemed relevant to such decisions should be fed upward in a bureaucratic hierarchy to politicians to take command-and-control decisions binding on all.

COMPREHENSIVE EVALUATION AND ITS IMPLICATIONS

At this point I need to go on what may seem to be a digression.

Comprehensive evaluation requires us to document *all* the long- and short-term, personal and social, desired and desired, undesired and undesirable consequences for different kinds of people in different social situations: What is good for the individual may be bad for society; what is good in the short-term may be bad in the long-term; what is good in one way may be harmful in another.

This may seem obvious enough. But it has not *been* obvious in the past. On the contrary, "decision takers" – politicians – tend to focus on single issues, thereby completely overlooking the fact that, as we shall see in more detail later, single-factor intervention in poorly understood systems almost always has counterintuitive, and usually counterproductive, effects. Even more disturbingly, this stance is supported by the most widely accepted, even promoted, image of "science". This kind of science is best designated as "reductionist science"(Shiva, 1998). It argues that it is entirely appropriate to study and report only selected, single factor, outcomes of an experiment or intervention and to ignore others. The practice is justified as "testing hypotheses". This facilitates evaluations which report such things as the short-term increases in crop yields resulting from applying a pesticide whilst failing to study or report on the long-term effects, never mind the much more serious effects on habitat and the food chain (Deming, 1980a; Kohn 1993/1999; Seddon, 2008)[8] [9].

[8] In reality both of these observations illustrate the, actually horrendous, pervasive and pernicious effects of neglecting systems thinking in policy making and science. These are discussed more fully in Raven (2016). The incorporation of single-factor thinking into policy-making inhibits any tendency to set up a variety of experiments to cater for people who have different priorities to one's own and to test alternative ways of thinking about things. Combined with the previously mentioned pervasive predisposition to believe that one has

So: To pick up from where we left off before we embarked on this "digression", it would seem that documenting the consequences of educational programme options in a comprehensive way and feeding that information to the public to enable them to make informed choices involves nothing less than the evolution of new concepts of science on the one hand and bureaucracy and democracy as components in a learning society on the other.

IMPLICATIONS FOR BUREAUCRACY AND DEMOCRACY

Now to say a little more about the implications for concepts of bureaucracy and democracy.

Whose job is it going to be to carry out the activities mentioned before our "digression"? As far as I can see, it has to be the job of public servants. I mean that it has to be their job to arrange for the creation a variety of options in every community, to ensure that they are comprehensively evaluated (Raven, 2014a)[10] [11], and to feed

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a right to impose what one believes to be good and right on others by force – and regardless of most of the consequences for people who embrace alternative values – the process leads directly to the emergence of what are, in effect, fascist policies and, in the end, Fascist regimes.

[9] It may be useful to give another example of the effect of neglecting systems thinking in "management". To many people it seems obvious that the performance of systems can be improved by setting "targets". In reality, the setting of "targets" always makes things worse. This is because they deflect people's attention away from the goals the system was intended to achieve and the multiple things which would need to be done to achieve them and instead lead them to invent ways of meeting the mandated targets without doing what would actually need to be done to achieve the system goals effectively.

[10] The amount of research needed to develop the understandings and measures needed to move toward comprehensive evaluations cannot be overestimated. There are no agreed conceptual frameworks for thinking about and assessing multiple talents and high level competencies in general, let alone how they are to be nurtured. Actually, finding ways to handle these problems requires a paradigm shift in ways of thinking about the nature of competence,

this information to the public so that they can make informed choices between them. More fundamentally, it becomes their job to promote a ferment of innovation and learning. This means encouraging everyone in the system to experiment in their own areas and to support those trying to do so in related areas. It means facilitating the evolution of comprehensive evaluations.

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measurement, and science in psychology and education. The dearth of conceptual frameworks and tools to think about and assess the outcomes of social processes, and thereby to move toward evaluations that are more complete and comprehensive than those employed in "economic" and market evaluations, is staggering. It follows that one of the responsibilities of our public servants must be to make appropriate arrangements for the conduct of this problem-driven (as distinct from literature-driven) adventurous research. (Note that such research will challenge the paradigms of those who currently control the funding and evaluation of research.)

[11] There are, in fact, even more fundamental problems to be addressed by the scientific community than those discussed in the note above. Some of those involved in the degrowth movement have suggested that there may even be a fundamental problem inherent in the very way of thinking we have followed here. To ask "How is it possible to view those sleeping rough in the streets as making a positive contribution to society?" already traps us into evaluative terminology. Maybe we should merely accept difference without implying any valuation or judgment. How is it possible to even think about and describe communities (eg "flow" cultures) which, at least on the face of it, appear to function in this way? This is perhaps a more extreme version of a problem that has bothered me for years. I have found it almost impossible to communicate what I understand people in working class communities are telling me about their values and priorities to middle class researchers. These researchers at first question the meaning of the words my interviewees have used in such a way as to make them appear to be nonsense. And, if this in itself is not sufficient to prevent them hearing what is being said, they move on to saying "but, even you are correctly conveying what they have said, they *should not* think like that". As I see it, this is only the beginning of the problem. In what terms is one to discuss what it feels like to live in, and how one views others in, a "flow" community – ie in a community in which there is no discernible hierarchy or religion – that is to say in a community like those that keep emerging in places like the Himalaya. We have no words or framework in terms of which to talk about them. Yet, if we are to survive as a species, our problem may be precisely to live in ways which correspond more closely to those found in these communities.

It means facilitating a move away from "scientific" methodologies grounded in reductionist thinking and promoting the evolution of other ways of advancing understanding. It means examining the results of any experiments that are initiated to draw out their implications for understanding the currently invisible *systems* processes that are preventing those activities reaching their goals. Creating a ferment of innovation also means acting on the information which becomes available in an innovative way – i.e. as part of a recursive cycle of experimentation, learning, and adjustment.

But, then, how to ensure that our public servants perform these newly identified duties?

At the heart of the answer to this question lies John Stuart Mill's observation (Mill, 1859/1962) that the way to get people to act in the long-term public interest (instead of their own short-term interests) is to expose their behaviour to the public gaze: "*Instead of the function of governing, for which it is radically unfit, the proper office of a representative assembly is to ... compel a full exposition and justification of all (acts) ... It should be apparent to all the world who did everything, and through whose default anything was left undone*". In the current context this points to a need for networks of open and overlapping supervisory groups, not a hierarchical structure.

MORE INSIGHTS INTO WHAT IS NEEDED FOR A LEARNING SOCIETY: PARALLEL ORGANISATION ACTIVITY

Perhaps the most important insights into how to create an innovative learning society come from the work of David McClelland and his colleagues (McClelland, 1961)[12]. However, very

[12] It is, however, important to note that McClelland's "achieving society" was a society characterised by economic development rather than, for example, high quality relationships, success in conquest, or high levels of well-being or sustainability.

many other researchers have made important contributions understanding the characteristics of innovative organisations. Many of these highlight things we can now recognise as being components of "organic" arrangements. In this context, Kanter (Kanter, 1985) made a distinctive contribution by drawing an important distinction between those arrangements that best facilitate the day-to-day working of organisations and those that facilitate innovation (although these remain crucially interlinked).

Those that facilitate innovation she called "parallel organization" activity"[13].

Kanter first drew attention to the fact that most innovative activity is not carried out by separate cadres of R&D specialists but rather by those who undertake the day-to-day work of the organization: It is *an integral part of* the system.

The main requirements for effective "parallel organization" activity are that:

1. Time and resources are set aside for activities intended to result in innovation and improvement.
2. During that time people work in a non-hierarchical relationships. Innovation requires fluid networks of *ad hoc* working groups, forming and disbanding as needs change. These groups bring together a wide variety of people, and thereby facilitate the identification, development, and utilisation of normally unrecognized talents to create emergent climates of enterprise or innovation which harness a wide range of generally unrecognised talents. Gardner (Gardner, 1987)[14] has characterised the emergent properties of these groups as cultures of intelligence or enterprise (Raven, 2014b)[15]. Whereas

[13] Note that Kanter's research was not confined to private-sector organisations.

[14] But see note 8.7 in Raven (1994) regarding the use of the word "intelligence".

[15] An engaging account summarising our observations in some primary schools will be found in my paper *Our Incompetent Society*.

novel, potentially risky, ideas tend to be filtered out in hierarchies, flat, non-hierarchical, arrangements bring those with such ideas into direct contact with those capable of releasing resources. The arrangements make it possible for the organisation to capitalize on the insights of "coal face" workers instead of relying on "management" or an R&D department "to initiate new developments".

3. Managers and staff recognise the wide range of contributions that are necessary to carry out any kind of innovative activity effectively and assemble teams of people who contribute in very different ways to the exercise.
4. Managers and other staff identify those best able to undertake effective innovative activity, and channel the necessary resources to them. (Note that people's ability to succeed in such demanding, "risky", and adventurous activity is often unrelated to their ability to produce the formal paper "plans" so cherished by bureaucrats.)
5. There are opportunities to work with people engaged with similar problems, both within the organisation and outside it. Such collaboration generates new ideas and establishes and maintains a network of contacts to provide help and support when difficulties arise.
6. Staff are encouraged to form "political coalitions" with others outside their own organisation in order to find ways of influencing external constraints. In education, these include parental expectations, the sociological functions the educational system performs for society, the expectations of those who currently manage education, and the assessment procedures available.
7. There is access to R&D laboratories developing the required concepts, understandings, and tools, but in such a way that those concerned are able to initiate and take part in the research and development process.

Although more insights into what needs to be done to develop a learning society can be achieved by setting this work in the context of a framework later developed by McClelland and co-workers (McClelland, 1965; Litwin & Stringer, 1967, 1968; Klemp, Munger, & Spencer, 1977), there is not space to do this here. Interested readers should turn to Chapter 21 of my book *The New Wealth of Nations: The Societal Learning Arrangements Needed for a Sustainable Society*[16].

Nevertheless, before moving on, it may be helpful if I reiterate a couple of things said earlier: It seems to me that it is really the job of public servants to introduce the arrangements required to promote innovation as a component of the learning society we need to evolve and that new "democratic" arrangements are required to help to ensure that they perform that job effectively.

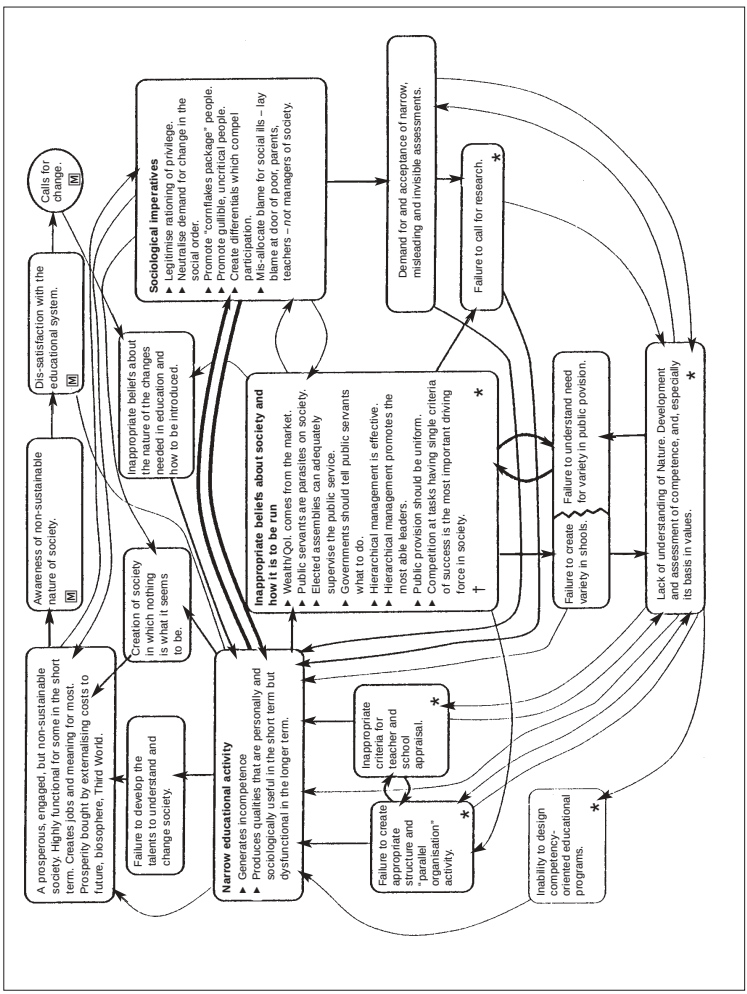
MORE LESSONS FROM OUR STUDY OF THE EDUCATIONAL SYSTEM

At this point we can return to our studies of why the educational system generally fails to perform its manifest educational functions.

The *most* important lessons we learned in the course of these studies were at a rather different level to those we have so far reviewed.

The first important lesson was that the processes contributing to the educational system's abject failure to perform its manifest functions effectively do not operate independently but collectively generate a network, or *system*, of recursive and mutually supportive feedback loops. It becomes virtually impossible to change any one part without changing others – otherwise the changes one has made are either negated by the reactions of the rest of the system or produce unanticipated, and often unwanted, changes

[16] See Raven (1995) http://eyeonsociety.co.uk/resources/NWNChap21.pdf



*Intervention in these cells would help change the nature of the qualities nurtured and rewarded in the system. Motives which could be harnessed to do this are marked M.

†These need to be replaced by acceptance of the need to make managed economies work – to find way of giving effect to information concerning the public long-term interest, the need to explicitly create variety and information on the personal and social consequences of the options, and to find ways of holding public servants accountable for, and getting them to at in, the long-term public interest. This means systematic, broadly based, evaluation and participative democracy.

Figure 1. Feedback Loops Driving Down Quality of Education

elsewhere. What is more, this network seems to have a capacity to perpetuate, even extend and elaborate, itself[17]. This network of feedback loops is sketched in Figure 1.

This systemogram actually illustrates very many important things most of which cannot be discussed here (Raven, 1994; 2012).

Nevertheless, just to get a feel for how it works, it is worth following round the triangle of links in the top left hand corner. The activities that dominate schools today, while helping a few pupils to acquire certificates which contribute to their personal advancement, fail to nurture the talents of most pupils; indeed they generate "trained incapacity". These processes collectively result in a societal competence deficit in which a few accumulate material wealth whilst destroying the habitat of all and a society which is characterised by deep divisions between the rich and the poor. Awareness of the non-sustainable nature of these arrangements leads to widespread dis-satisfaction with the system and the educational system in particular. This leads people to call on politicians to improve things. Unfortunately current beliefs about how society should be run (shown in the central box) lead those politicians to do such things as generate prescriptions for what every teacher must be doing during every ten minutes of the day and impose standardised testing to monitor their performance. These tests, because they are norm-referenced, have the opposite effect to that nominally intended: They teach about half the pupils that they are failures … a position from which, given the way the tests are constructed and their norm-referenced nature, they cannot escape no matter how hard they try. As far as they are concerned they are caught up in a Kafkaesque system. From the point of view of designing a more effective *educational* system, it is even more important to note that these tests (standards, targets) actually lack both construct validity and predictive validity

[17] An enlargeable version of this systemogram is available at: http://eyeonsociety.co.uk/resources/Figure%201%20%28formerly%2023.1%29%20rev.pdf.

outside the school system (Raven, 1991). And this, of course, by focussing attention on senseless things, helps to perpetuate both the destructive nature of schooling and the acceptance of senseless work in which one is pushed about by forces over which one has no control.

Another loop to which it is important to draw attention is the recursive, self-reinforcing (recursive), loop drawn right across the centre of the Figure between the roles schools play in generating, and reinforcing belief in, hierarchy and the sociological imperative that they do exactly that.

Standing further back from the figure what we see is that:

1. It is impossible to achieve significant benefits by changing any one part of the system … such as curriculum or examinations or teacher training on its own … without simultaneously making other changes elsewhere – otherwise the effects of the change will either be negated by the reactions of the rest of the system or produce counterintuitive, and usually counterproductive, changes elsewhere. On the other hand, it is equally clear that command-and-control-based system-wide change based on uninformed opinion will achieve little.
2. Pervasive, *systems-oriented,* changes are required to move forward. But these changes, although collectively system-wide, cannot be centrally mandated because there are too many new things to be done.
3. Since what happens is not determined by the wishes of any particular group of people but *by the operation of the system itself* the widespread tendency to single out and *blame* parents, pupils, teachers, public servants, or politicians is entirely inappropriate. *Their* behaviour is mainly determined by the system. One needs to take these systemic forces seriously and ask how they can be harnessed in an analogous way to that in which ships' designers harness the potentially destructive forces of the wind: They will not go away!

4. It is vital to generalise the observation made in (3): We need to fundamentally re-frame the way we think about the causation of behaviour in a way which parallels one of the transformations Newton introduced into physics. Before Newton, if objects moved or changed direction, it was because of their *internal* properties: they were *animated.* After Newton it was mainly because they were acted upon by a network of invisible *external* forces which could nevertheless be mapped, measured and harnessed. Observation (3) implies that we need a similar transformation in the way we think about the causes of human behaviour.
5. The *causes* of the symptoms (and thus the appropriate place to start reform) are far removed from those symptoms.
6. The system not only reproduces itself – it generates ever more elaborate versions of itself; it is self-elaborating; autopoietic[18].

In the foregoing, we have repeatedly used the word "force". We must now take up the question of the nature, or status, of the "forces" depicted. The links depicted in our systemogram are not flows of e.g., resources as in the models developed for the "Club of Rome" report *Limits to Growth* (Meadows, Meadows & Randers, 2008). Nor are they flows of "information" as in networks of e-mails. Nor are they flows of, e.g. people, from one section of the "educational system" to another. The contents of the boxes are not numbers of people or stocks of food. Only if the feedback loops do really represent *forces* in some sense analogous to the physical forces represented in the diagrams of physics does it make sense to ask how they can be harnessed (as in the forces

[18] The word "autopoietic" implies a system which is, in some sense self-organising, self-reproducing, and self-extending. The problem with the term "self-organising" on its own is that it is frequently taken to absolve the user from the need to explain how the process works. What we have seen here is that the "self-organising" processes of the educational system involve a whole series of mutually reinforcing and recursive feedback loops both within the educational system and in relation to the wider society.

acting on a sailing boat[19]) or amplified or damped down (as in the flows of electrical energy in a radio).

Put like that, it suggests that the need is to find ways of mapping, measuring, and harnessing social forces in a manner analogous to those adopted by physicists and engineers. And there would, in fact, be an immediate benefit of even trying to do that because, as will be discussed later, perhaps the best way to bring about clarification of the answers to the above questions would be to set about trying to translate the systemogram in Figure 1 into a Dynamic Systems Model. Unfortunately, as was stressed earlier, the field of cybernetics encompasses the study of such things as the multiple, non-hierarchical, guidance and control systems that operate within organisms or within ecological niches and, in trying to map and describe these processes, biologists and ecologists have encountered much the same intractable problems as we have come up against here.

Common-Sense-Based Intervention in Complex Cybernetic Systems has Counterintuitive and Usually Counterproductive Results

At this point it is worth going on what may initially seem like another digression.

We have mentioned that common-sense based one-variable-at-a-time interventions in complex systems tend to have counterintuitive, and usually counterproductive, effects.

A number of dramatic illustrations of this process in connection with the serious ecological problems mentioned at the beginning of this article can be found in Forrester (1971). Forrester mapped and weighted the (often recursive) feedback loops between the main economic and bio-physical resource variables contributing to such things as world population, pollution, food supply, and

[19] A brief description of the way in which this is done may be found in Appendix A to Raven & Gallon (2010).

quality of life[20]. In due course, this yielded the predictions, or scenarios, which would follow from making a variety of interventions (or doing nothing at all) that formed the basis of what came to be known as the "Club of Rome" report *Limits to Growth* (Meadows, Meadows & Behrens, 1972).

One big difference between his map (or model) and our systemogram of the interacting processes controlling what happens in "education" is that it was possible to quantify these inputs and outcomes and their interactions using standard economic and consumption indices. But, more than that, it was possible to see what would happen if, for example, a decision were made to limit car production. For this reason this kind of map or model is referred to as a *Dynamic* System Model to distinguish it from a static, one-off, snapshot.

Forrester gives several striking examples of the, generally counterintuitive, effects of changing some of the policy-generated inputs fed into the model (also describable as a "network" of links or processes).

Many of the results are dramatic and frightening, thus illustrating the importance of studying systems *qua* systems.

Figure 2 below shows the trends which, starting with estimates of conditions in 1900, would occur in the six important outcomes they studied if things are left pretty much as they are[21]. Under these conditions industrialization will eventually be suppressed by falling natural resources.

Quality of life peaks in the 1950s and, by 2020, will have fallen far enough to halt further rise in population. Declining resources, and the consequent fall in capital investment, exert further pressure which gradually reduces world population.

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[20] A simplified version of this map, or model, of the overall cybernetic system is available in Raven & Gallon, (2010).

[21] These predictions have so far proved accurate. See Meadows et al. (2004).

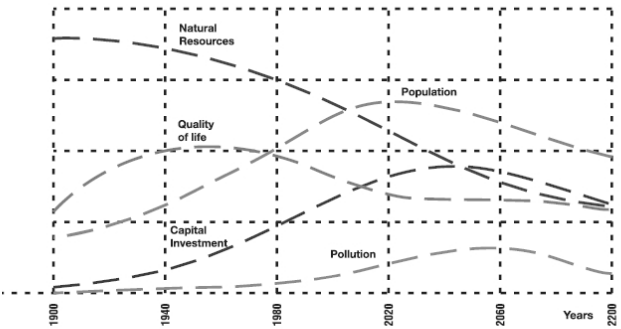

Figure 2. Natural Resources; Population; Quality of Life; Capital Investment; Pollution.

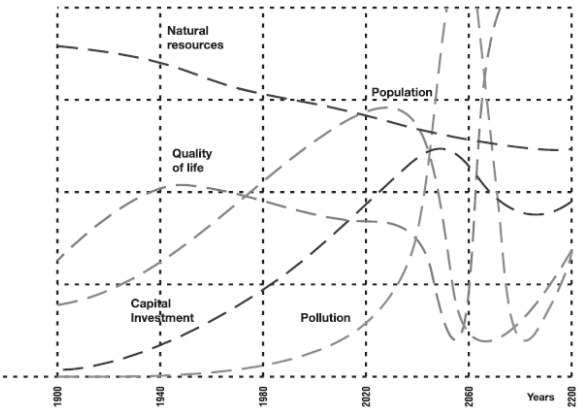

Figure 3. A pollution crisis is precipitated by lower usage of natural resources. In 1970, natural resource usage is reduced 75 per cent by more effective technology without affecting material standard of living. The Pollution crisis produces a dramatic drop in population.

Forrester comments that we may not be fortunate enough to gradually run out of natural resources in this way.

Science and technology may find ways to use more plentiful metals and alternative ways of generating energy so that resource depletion does not intervene.

But, if this happens, it only leaves the way open for another growth-resisting pressure to arise.

Figure 3 shows what happens if a resource shortage is avoided.

Here the only change from the assumptions fed into Figure 2 concerns the rate of usage of natural resources. In Figure 3, resources are, after 1970, consumed at a rate 75 per cent less than assumed in Figure 2.

In this way the standard of living is sustained with less drain on expendable and irreplaceable resources.

But the outcome is even less attractive than it would have been if things had been left alone!

By not running out of resources, population and capital investment are able to rise until a pollution crisis is created. Pollution then acts directly to reduce birth rate, increase death rate, and depress food production. In this case, population, which peaks in 2030, declines by 83% within 20 years. Forrester notes that this would be a disaster of unprecedented proportions.

Generalising: What we have here is a dramatic illustration of the everyday experience that common-sense based interventions aimed at fixing one problem at a time within a poorly understood system create unexpected problems somewhere else in the system[22].

More importantly, we see the benefits that would follow from transforming the systemogram shown in Figure 1 into a *dynamic system model*.

However, as mentioned earlier, there would be more immediate benefits of even trying to bring about this transformation even if the desired result could not be achieved. The very attempt to do so would lead to clarification of what is involved in the feedback loops depicted in the Figure.

Unfortunately, as we reviewed Meadows' work, we, came up against a serious problem which would be exacerbated if we set

[22] More examples are given in Raven & Gallon (2010).

out to use their work to guide our own. The authors conclude that we "lack the political will" to implement the solutions to which their analyses point.

Astoundingly, this apparently obvious statement reveals very serious limitations in their work: it indicates is that the Forrester/Meadows team *have been unable to map and analyse the network of connections and social forces which determine the human inputs to the system.*

In other words they have not been able to map the network of social processes and forces which corresponds to that which controls the operation of the educational system.

The result is that their work does not, in the end, really help us tackle the very problem they set out to help society tackle, let alone offer us a template to guide our own work!

But that is not the only problem. Insofar as it does offer guidance, it relies on decisions being taken by "decision takers" … in short on a conventional hierarchical image of governance and single-factor interventions along the very lines they themselves go to such lengths to criticise!

Despite these setbacks, several things *are* now clear. One is that, if one is to intervene effectively in social systems, we need some basic understanding of the system we are dealing with. Then we need to make numerous, *systems-oriented* interventions. And then we need to monitor their effects in a comprehensive way. And follow this by a further round of comprehensively evaluated interventions[23] [24].

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[23] It is hard to resist commenting that it is precisely this cycle that is missing from the arrangements currently made to develop and reform government policy.

[24] Some remarkable work following this cycle, complete with the generation of dynamic systems maps of the interacting processes and comprehensive evaluation of the outcomes as part of a continuing cycle of improvement, has been reported by Bosch and his colleagues (2013) in connection with a number of community development projects.

Ironically, generating an understanding of a system depends on diffuse experimentation *coupled with comprehensive evaluation and a deliberate effort to elucidate the implications of the effects of the action – both intended and unintended – for our understandings the system itself.* It is quite possible that a diffuse network of such experiments might lead to some kind of assessment of the relative weights to be attached to each of the feedback loops.

But, to come back to education and reiterate a point made earlier, it is clear that what happens is mainly determined by a network of rarely discussed, mutually supportive and recursive, sociological processes. We have to come up with ways of intervening in that network. One contribution might be to introduce measures of a wide range of talents into the assessments that are made at the interface between the educational system and society. Such an action would certainly alter the effects of the sociological process. But what, exactly, would they be? How could we monitor them? How could we represent them in our systemogram? Would one now say that it is *what is assessed* that plays the dominant role in determining what happens in "education"? And, yes, well … but, what of the value conflicts involved? Indeed do not these reflections suggest that one reason why we persist with the current, almost meaningless, measures is precisely *because* they evade the problems involved in assessing anything really important … like values, honesty, initiative, critical thinking, or the presence or absence of a supportive home culture[25].

THE WAY FORWARD

How then to design a better guidance and control system for the management of the educational system and society more generally?

[25] See Flynn (1991; 2008) for evidence of the importance of all of these things.

There are many more descriptions of relatively more effective organisational arrangements than those that come up in responses to a search for research on innovation[26].

It was Bookchin[27] who originally noted that a common characteristic of more successful and more viable arrangements seemed to be that they incorporated features of the 'organic'.

In the course of his writings Bookchin noted that many preliterate societies had, and have, such arrangements. Many have no chief, no hierarchy, no formalised religion, no written language, and no formal government structure. And the activities undertaken by individuals within them change depending on the "needs" of the whole.

Bookchin also notes that the observation that centralised command-and-control structures tend to run into enormous problems and generally fail to deliver high quality of life for most of those who participate in them has been made repeatedly and forcefully over millennia. Likewise, there have been endless demonstrations of the viability and success of alternatives at organisational, community, and state level. But the trend toward centralisation and command and control arrangements has proved inexorable. It is therefore imperative to understand it.

The Wider Context: The Destruction of Life on Earth

There is not space in this paper to develop in any detail the claim that the autopoietic system controlling the operation and development of the educational system which we mapped earlier is part of a wider autopoietic system controlling the operation of society. Nor is there space to fully support my claim that these

[26] In addition to those which come up in a search for research into the nature of innovative organisations more detailed reports on the functioning of more effective organisations abound. Examples include those contributed by Deming (1980b), Erdal (2008), Goldratt & Cox (2007), Johnson & Bröms (2000), Kohn. (1993/1999), Semler (2001), and Wheatley (1994).

[27] Bookchin (2005) but see Raven (2009) for a summary.

processes are heading our species toward extinction carrying at least a large proportion of all known life with us.

Nevertheless, the matter cannot be allowed to pass without comment. It is now widely recognised that we, as a species, are heading toward our own extinction[28]. Although the academic papers cited in that endnote contain many graphs showing that numerous trends are accelerating exponentially out of control, the most striking summarising statement is that of Wackernagel and Rees (Wackernagel & Rees, 1996). They have shown that it would require five backup planets engaged in nothing but agriculture for everyone alive today to live as Americans do.

There is a strong tendency to attribute this widely recognised plunge of homo-sapiens toward self-destruction to the doings of evil capitalists. Yet our work on the educational system shows that the process has too many components to support the view that it has been designed some kind of an elite. What is most striking is that the system has evolved further and further along its current trajectory despite the repeated demonstration that the vast majority of pupils, parents, teachers, ex-pupils, and employers want it to move in exactly the opposite direction and despite the existence of a number of alternatives.

Bookchin[29] developed the thesis, amply supported by historical and anthropological data, that our plunge toward self-destruction as a species has mainly been brought about by the creation of endless work which consumes exponentially increasing proportions of the world's resources and inflicts similarly increasing destruction on the soils, seas, and atmosphere. Furthermore, contrary to what the conventional wisdom would have us believe, this work contributes little to quality of life (Lane, 1991; Marks et al., 2006) and can therefore reasonably described as "senseless" (Graeber, 2013).

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[28] e.g. Meadows et al. (1972, 2004), Oskamp (2000), Stern (2000), Raven (1995; 2009), Anderson et al. (2001), Wikipedia "Sustainability" entry.

[29] Bookchin (2005), but see Raven (2009) for a summary.

He argues, convincingly, that the main function[30] of this work is to legitimise, even constitute, hierarchy. The function of hierarchy is sinister indeed. It is to compel most people, often against their will, to engage in this senseless, in deed destructive, work for fear of being assigned to the demeaning and degrading positions in which those who fail to do so find themselves. The process has continued inexorably over thousands of years despite the protests of endless thoughtful people and experimental demonstrations of the viability of alternatives. This, of course, parallels our own observations about the so-called "educational" system where we saw, in Figure 1, that what happens is mainly controlled by a recursive interaction with what we called a sociological imperative. As we have seen, nothing could be more serious because the outcome of this endless senseless work is likely to be the destruction of the planet as we know it. It would therefore seem that developing an understanding of, and finding ways of intervening in, this network of forces would be of even greater value than might be guessed from an examination of the educational system alone.

Indeed, that is an understatement. Because it is this network of social forces which cumulatively constitute the oppressive, but hard to identify or influence, network that we previously described as Kafkaesque.

But now we can add a second characterisation.

In the course of our subsequent discussion we have shown that this network of social forces is heading our species toward extinction (by destroying our habitat) and taking the planet as we know it with us.

If the network of processes which has led to the emergence of this planet with all the life associated with it can be described

[30] The creation of this senseless work is supported by endless myths (such as the belief in the efficiency of the "market process" and beliefs about the value of "education") and constitutes "the economic system" itself. One may well ask what a society without this senseless work would look like. How would one give meaning to people's lives? How would they gain access to the wherewithal required to pursue a decent way of life?

as Gaian, it would seem that we are entitled to characterise the Kafkaesque network of social processes we are discussing here as Thanatosian … death-oriented.

It follows that it is of vital importance to seek to understand and find ways of influencing these processes.

MORE FROM THE DOMAIN OF PHYSICS

I am about to suggest that we can gain further insights into how it might be possible to do this by saying a little more about Newton's contribution to the study of physical forces.

Prior to Newton, it was impossible for sailing boats to sail into the wind. Worse than that, they were at the mercy of the wind and the waves – which often pushed them where they did not want to go and crashed them against the rocks. But there was no unifying concept of *force.* Newton not only articulated that idea but showed that it was *measurable*. Indeed the two things went hand in hand. To show that this invisible component in the wind was measurable, Newton jumped into the wind and measured how far he had jumped. And then he repeated the operation, this time jumping *with* the wind. The difference between the two gave him a measure of the strength of this elusive thing (which he called "force") in the wind. The level of measurement required to legitimise a concept does not have to be sophisticated.

As noted earlier, prior to Newton, if things moved or changed direction it was because they were possessed of animal spirits … they were *animated.* After Newton it was because they were pushed or pulled.

He also made a couple of other observations that were crucial to designing more effective sailing boats. The first was that "To every force there is always an equal and opposite reaction"; the problem is to identify it. The other is that the forces acting upon a body can be resolved into orthogonal components and thus

reduced to three which in the end enable one to predict what will happen[31] – from which it follows that one may then be able to intervene to ensure a more desirable outcome.

The observation that there must be somewhere an equal and opposite force to that of the wind on the sailing boat in due course led to its being found – unimaginably – in the sea. And a search for ways of harnessing that force at the same time as harnessing the forces arising from the action of the wind on the sails led to the addition of keels to sailing boats.

These remarks imply that the first thing we have to do if we want to think about social forces is to de-animate the way we think about the processes that are currently believed to be driving us toward our self-destruction. We have to stop blaming (and wringing our hands about) our leaders and the capitalists. Instead, we have to see them as *expressions* of a network of hidden forces. They are selected and promoted and behave as they do because of those forces. What is more, people who behave in ways which resemble our leaders and capitalists are not few in number but pervade our society. Then we have to identify those forces. And, after that, take steps to harness them. A relatively naïve suggestion (which nevertheless illustrates the point) is the one we have already mentioned: including measures of a wider range of the outcomes of education in the certification and placement process which intervenes between schools and society could drive schools towards doing the things we want them to do rather than away from them. (Such a development would be the equivalent of adding keels to sailing boats.)

But the development of a relatively safe network of sailing boats depended on many other things besides the classic academic inputs of Newton and others. It also depended on the emergence of a complex, largely invisible, sociocybernetic (public management) system embodying many interlinked developments: It was

[31] See Appendix of Raven & Gallon (2010) for a fuller explanation.

necessary to accumulate a host of charts of the seas and the ports, to evolve sextants and chronometers so that ships' captains could know where they were on the high seas, to erect lighthouses, to develop means of paying lighthouse keepers, and so on and so on. In short, as McClelland and his colleagues demonstrated (although they did not formulate it in these terms) it depended on the emergence of a context which can now be described as a *learning society* or a "culture of enterprise".

In short, it would seem that, if we wish to move forward, we will have to both (1) find better ways of conceptualising, mapping, measuring and harnessing social forces (or, to pursue an alternative, and perhaps more appropriate, analogy, to find better ways of mapping the feedback loops within organisms and in ecological niches[32]) and (2) facilitate the evolution of some kind of embedded[33] societal management systems of a kind best characterised as *organic.*

An Incidental, but Perhaps Revolutionary, Observation

At this point we may draw attention to a, somewhat paradoxical, but strikingly fundamental, thought that seems to have emerged in our discussion. This is that what we have said essentially involves turning psychology inside out. It means de-animating the explanation of human behaviour in the way Newton de-animated the explanation of the behaviour of moving objects. It means attributing much of what we and others do to the invisible social forces that act upon us instead of to personal

[32] This second analogy has perhaps best been developed by Bertalanffy (1968) who draws a sharp distinction between his way of thinking and that developed by sociocyberneticians.

[33] It may be useful to draw attention to Deming's (1980a) claim that there is no need for a separate system of job descriptions and quality control procedures to control production because these are best embedded *in the work itself*. The key lies in *the design of the system*.

motives, characteristics, and competencies[34]. Of course that is an over-statement because we have spoken of the role of these forces in selecting and promoting certain sorts of people. Nevertheless there is something of an irony in suggesting that the way forward involves promoting the use of psychology to de-psychologise the explanation of human behaviour!

SUMMARY

In the course of this article it has been argued that harnessing social processes for the common good depends on creating a *learning society* which will innovate, learn, and evolve in the long-term public interest. In essence, this involves establishing more embedded, interconnected and interacting, organic feedback (sociocybernetic) loops which do not depend on long and distorting chains of accountability to distant assemblies of "decision takers" who are overloaded, ignorant of most of the information that is relevant to the decisions they are taking, relatively isolated from feedback, and largely constrained to imposing single-value policies on all rather than creating arrangements which would encourage diversity and thus facilitate the emergence of evolution of new solutions.

We offered one possible answer[35] to the question of how to build on current forms of bureaucracy and democracy to create a ferment of experimentation and learning in the long-term public interest.

The necessary developments included a major emphasis on research to, among other things, devise indices of the outcomes

[34] This is dramatically illustrated by the fact that it has emerged that 94% of the variance in behaviour in organisations is determined by the system and only 6% by the individuals themselves (Seddon, 2008).

[35] We would welcome others.

and processes which need to be incorporated in the *comprehensive* evaluations required to facilitate information-based social evolution. Such evaluations need to include assessments of *all* the short and long-term, personal and social, desired and desirable, intended and unintended, consequences of alternatives. Consideration of what this involves led us to underline the need to move away from our current enthrallment with reductionist science and single-factor-based policy intervention. It emerged that the damage done by neglecting systems thinking in policy making and "science" has been nothing short of disastrous.

But it turned out that these were the least of our worries. Because, if our species is to survive, it is vital to find ways of understanding, mapping, and intervening in what we came to see as a network of social forces that have the future of our species and the planet in their grip. This we characterised as a Kafkaesque network … an invisible, unidentifiable, but all-pervasive, network constituting a power that we are unable to understand or influence. Worse, the network has Thanatosian properties in that it threatens to destroy Gaia (life itself).

We suggested that the developments needed to investigate and influence this process parallel those introduced into physics by Newton as he transformed a network of forces previously thought to be controlled by the gods into a network of physical forces which could be measured, mapped, and harnessed.

In short, it will be necessary to conceptualise social forces, show that they can be measured, and map them into a dynamic systems model of the forces and processes which operate *around,* and control, the network of economic and biological processes mapped by such authors as Forrester and Meadows for the *Limits to Growth* report.

This is, indeed, the most important challenge facing social researchers.

Unfortunately, given the way the very structures and arrangements we have described operate to eliminate change, conducting

such research is no easy matter. The requisite research not only challenges current images of science, current beliefs about appropriate forms of government, and the current paradigms of social science, it challenges most culturally accepted beliefs about how research is to be funded. It is adventurous research which is both problem-oriented and fundamental. It is not literature–driven and the outcomes cannot be specified in advance. Unexpectedly, therefore, one of our most important priorities has to be to challenge those funding arrangements and the ways in which the results of research are evaluated[36].

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[36] For a fuller discussion see chapter 24 *Arrangements for Policy Evaluation and Improvement* in my *New Wealth of Nations:* http://eyeonsociety.co.uk/resources/NWNChap24.pdf

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