

**Advances in Mapping, Measuring, and Harnessing  
the network of social forces which control  
the “Educational” System ...  
and  
Have the Future of Humankind and the Planet in their Grip.**

John Raven  
30 Great King St.,  
Edinburgh EH3 6QH  
Scotland

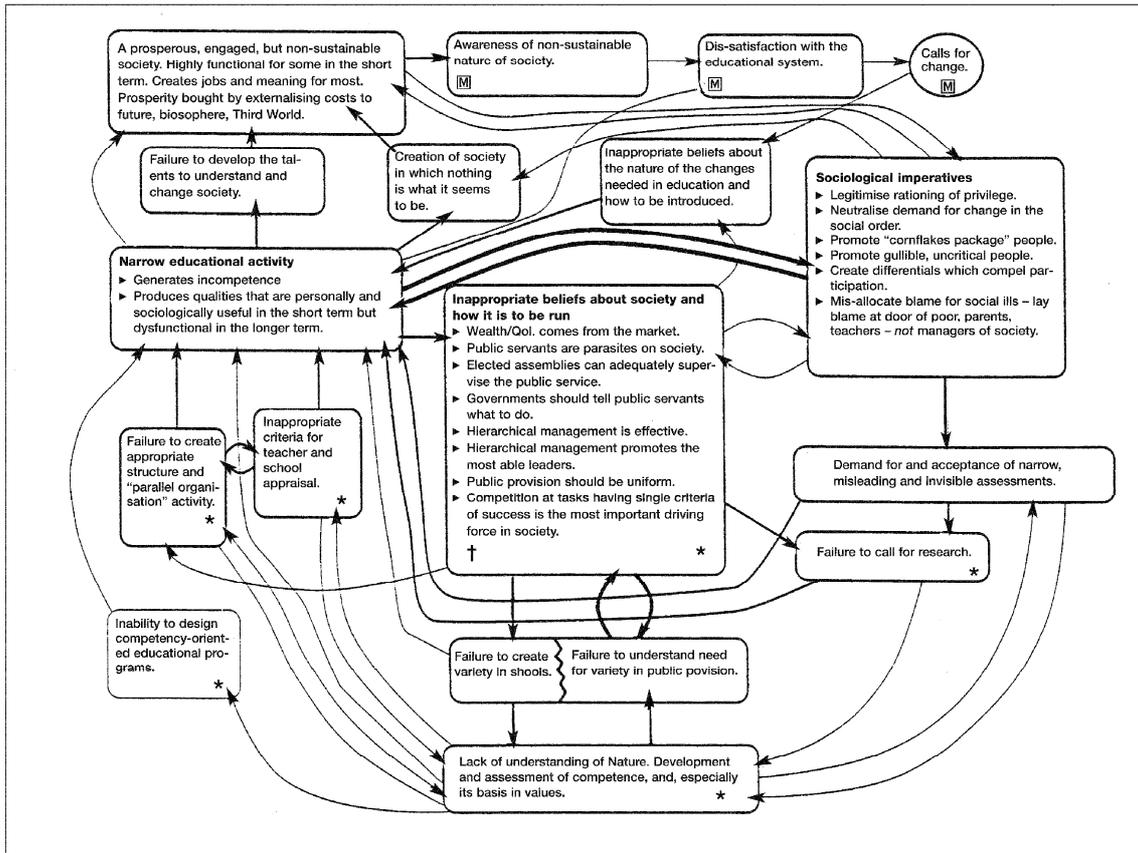
[jraven@ednet.co.uk](mailto:jraven@ednet.co.uk)  
website  
eyeonsociety.co.uk

Version Date:16.00 6 August 2012

This paper summarises some of the work we have carried out in this area since a modified version of Raven & Gallon (2010)<sup>1</sup> was published in the *Journal of Sociocybernetics*<sup>2</sup>.

Basically, that paper summarises, and seeks to extend, earlier research pointing to the conclusion that the rough systemogram of the network of social forces deflecting the so-called educational system from its manifest goals reproduced in Figure 1 indicates that two sub-systems are of particular importance.

The first of these sub systems comprises the formal governance (ie socio-cybernetic) system society deploys in an attempt to manage both the educational system and society more generally. Some, mainly dysfunctional, features of this sub-system are listed in the central box in Figure 1. The sub-system as a whole currently operates in such a way as to, among other things, stifle attempts to cater for, nurture, and recognise the diversity of students' talents<sup>3</sup>. Instead it arranges them in what is essentially a single-factor hierarchy of “ability”<sup>4</sup>. Although not noted in the systemogram, this seemingly unarguable hierarchy then contributes to, and adds legitimacy to, the hierarchical arrangement of society. The current governance system also stifles the variety, experimentation, and learning which would be required for any form of evolution worthy of the name to take place in the educational system itself.



\*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*

An enlargeable version of this diagram is available at:  
<http://eyeonsociety.co.uk/resources/Figure%201%20%28formerly%2023.1%29%20rev.pdf>

The second sub-system playing a major role in deflecting the educational system from its goals is a wider network of social forces that has generally been overlooked by researchers. This is represented in the right hand box, labelled “Sociological Imperatives”, in Figure 1.

It turns out that this sub-system also plays a major, if not the major, role in determining what happens in society as a whole. Its importance has been heavily underlined by Bookchin in his *Ecology of Freedom: the rise and dissolution of hierarchy*<sup>5</sup> which was re-published in 2005.

What Bookchin argued is that the sociological forces pushing toward the centralised, command and control oriented (as distinct from organically organised), management systems shown in the central box in Figure 1 have been evolving inexorably over endless millennia, over riding the numerous protests, documentation of the ecologically and humanly destructive nature of current ways of doing things, and demonstrations of the desirability and viability of alternatives that have occurred over at least the last two millennia.

Bookchin argues that the development and perpetuation of this hierarchical system depends above all on the creation of endless senseless work (such as building pyramids, manufacturing, marketing, and distributing cars, junk foods, junk toys, junk “defence” systems, and junk insurance systems). The hierarchical system that results constitutes, legitimises, and compels participation in, itself. Contrary to one of the self-reinforcing myths created by the system, it does little to contribute to quality of life<sup>6</sup>. But the senseless work on which it depends *does* destroy our habitat – and at an exponentially increasing rate at that. It is thus this senseless work which (combined with other things) is on the verge of eliminating homo-sapiens as a species, carrying the planet as we know it with us.

Bookchin simply attributes all this to a “self-organising” process. But such an “explanation” is altogether too facile. If we are really to explain it, it will be necessary to map and understand the network of mutually supportive and recursive socio-cybernetic forces involved.

This (socio-cybernetic) formulation of what needs to be done to move forward has been challenged by members of SCiO<sup>7</sup>, especially those who follow Beer’s *Viable Systems Model*<sup>8</sup> or the *General Systems Theory* of Bertalanffy (1976). It is argued that a cybernetic framework is too mechanical – too lacking in the openness characteristic of organic systems – and thus both an outcome of, and contributor to, the mindset that created the problem in the first place.

But before we get into a discussion of this particular issue, it is important to still further underline the importance of the problem by noting that what we have said means that, in contrast to the autopoietic, self-extending, network of processes which have promoted life and eventuated in Gaia herself (or perhaps the reverse), what we seem to be observing here is a network of processes which collectively amount to nothing less than an autopoietic (viz self-elaborating, self-reproducing, and self-extending) process destined to destroy Gaia – that is to say, life – itself.

Our conclusion is, therefore, that, regardless of the exact basis on which progress might be made, it is of the utmost importance to find ways of conceptualising, mapping, and harnessing the social forces involved.

Assistance in improving the map of social forces shown in Figure 1 ... ie those which control the operation of the “educational” system ... was sought at a number of SCiO and RC51<sup>9</sup> meetings. Luciano Gallon responded to this call most vigorously and, in the end, this resulted in the joint publication cited earlier.

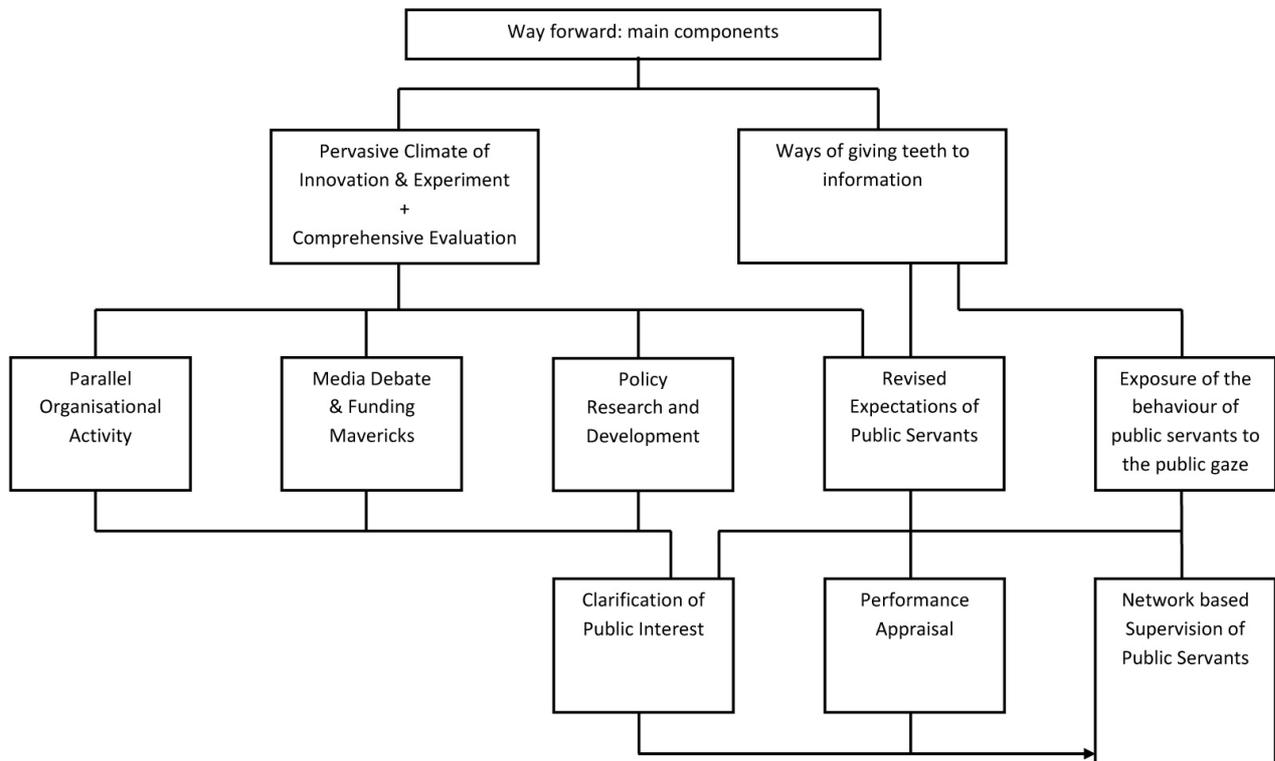
Cybernetics is the study of the (largely invisible) guidance and control systems of animals and machines ... and the design of better ones. What Figure 1 says is that the operation of the “educational” system is controlled by a network of invisible, mutually reinforcing, social forces. These collectively form an autopoietic social system with multiple interacting feedback loops. One cannot change any one part on its own without the effect of that change either being cancelled by the operation of the rest of the system or showing up as counterintuitive, and usually counterproductive, effects elsewhere. So, essentially, if we are to improve on things as they are, we must find nodes through which exogenous change can be introduced. What I have learned from Luciano, now supplemented by others, is that plotting the feedback loops needed to do this belongs to the domain of *Dynamic Systems Modelling*.

Detailed discussions with Luciano, backed up by further investigation of the work of Forrester, Meadows et al. (2004, 2008)<sup>10</sup>, STELLA<sup>11</sup>, and Harich (2010), have enabled me to become clearer about this.

By the time Figure 1 was published (in Raven, 1995) it had become clear that the widely shared image of – and, indeed, the actual operation of – the central “governance” sub-system within which the “educational” system operated (ie the box to the right of centre in Figure 1) needed to be re-designed along more organic lines. In saying that it needs to be more “organic” we mean to indicate that it needs to incorporate more, and especially more non-hierarchical, feedback loops and arrangements for promoting pervasive (non centrally directed) innovation.

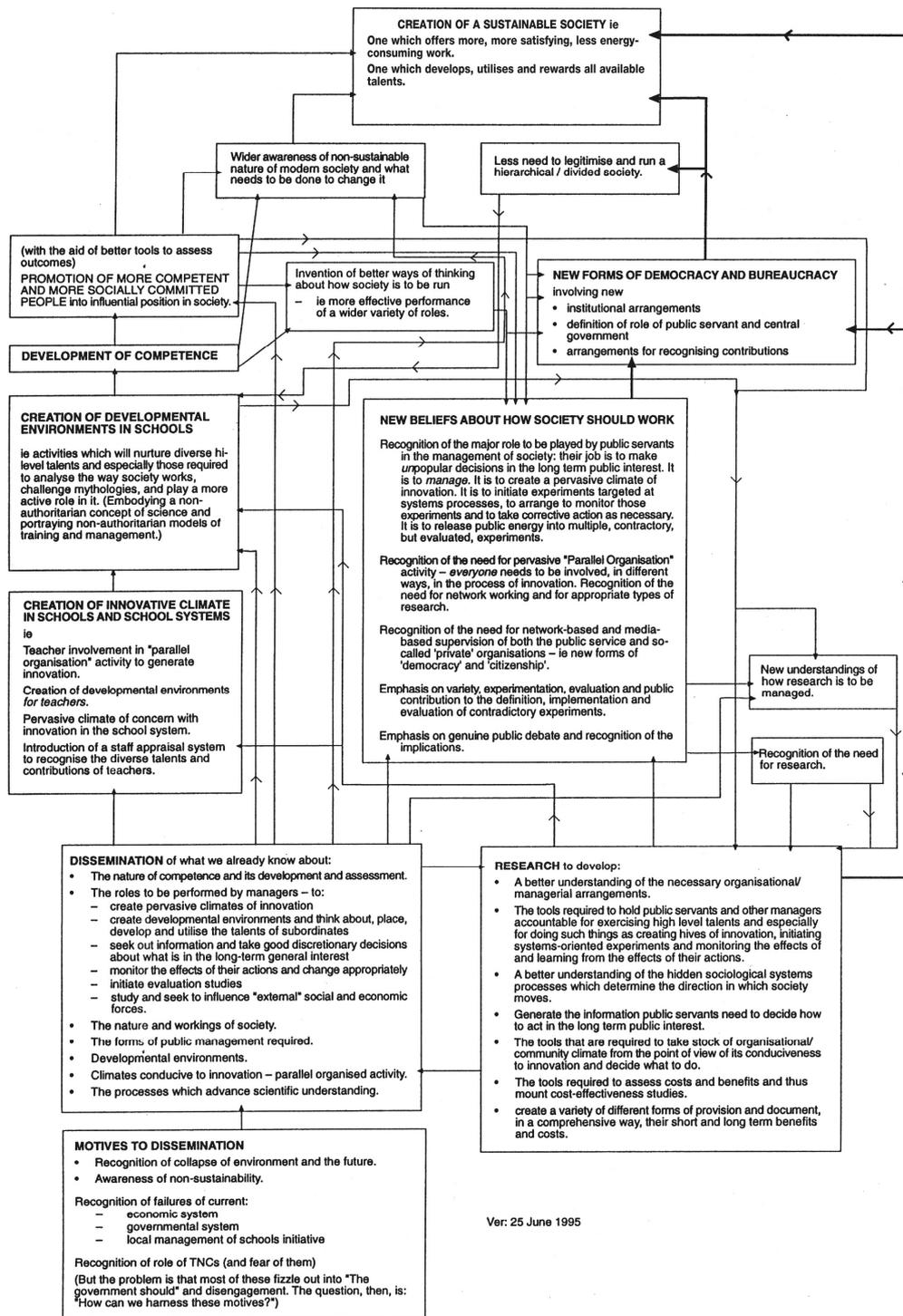
By 1995 it was also abundantly clear that the hierarchical design of our so-called “democratic” systems was driving us, as a species, toward our extinction at an ever increasing rate. As mentioned earlier, the work of Bookchin (2005) has since strongly reinforced this conclusion.

The main contribution of my *New Wealth of Nations* consisted in generating an alternative design for this governance box. Although the discussion of this actually occupied about half the book, the results were summarised in Chapter 19<sup>12 13</sup> and further condensed into the diagrams below. Unfortunately, but naturally given the condensation involved, these diagrams are anything but self-explanatory.



**Figure 2: Main components in Way Forward.**

An enlargeable version of this diagram is available at:  
<http://eyeonsociety.co.uk/resources/diagram25-1.pdf>



**Figure 3**  
Public Management Arrangements for a Sustainable Society.

An enlargeable version of this diagram is available at:  
<http://eyeonsociety.co.uk/resources/Figure%203%20%28formerly%20Diagram%2020.5%29.pdf>

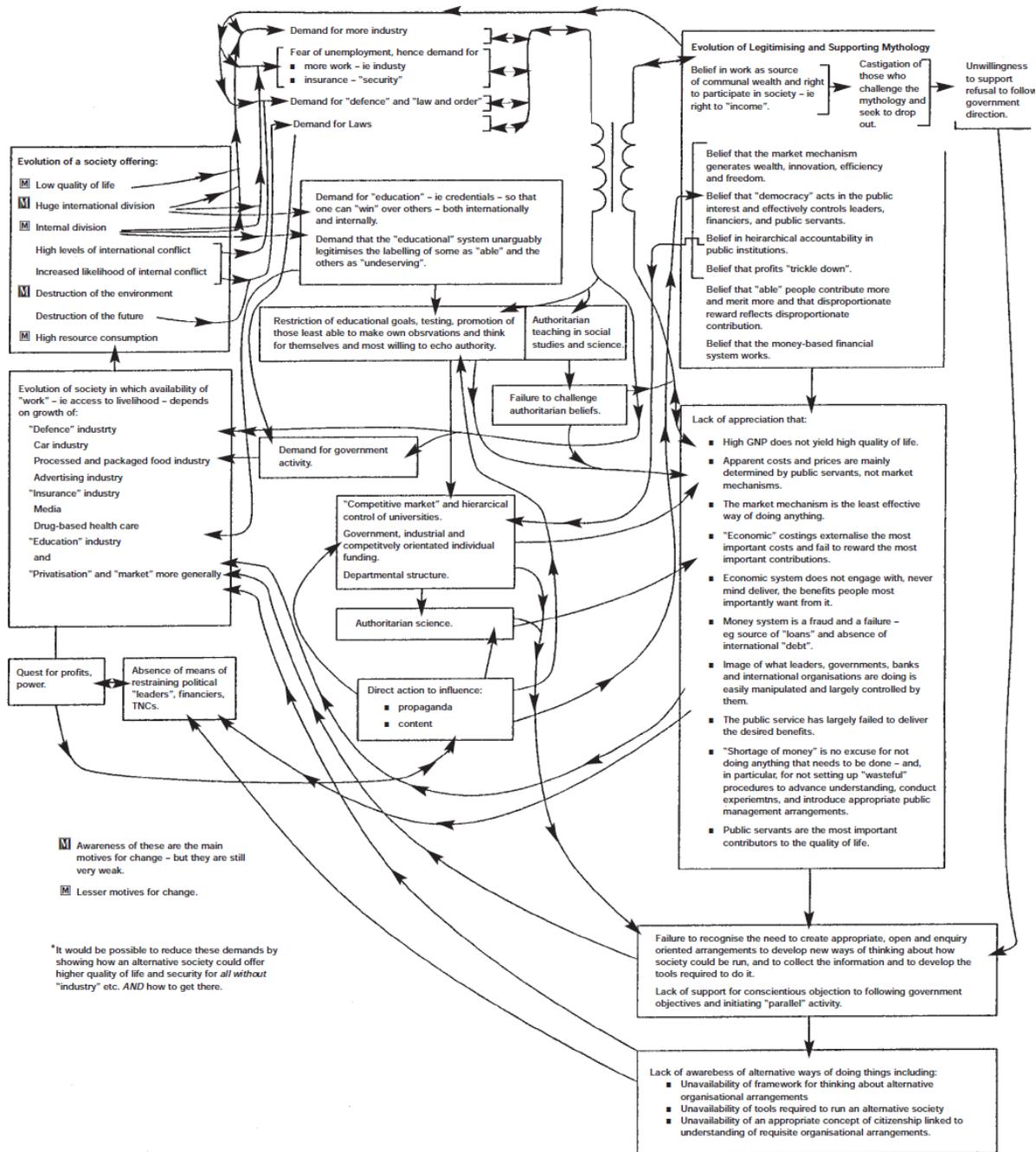
As mentioned, the very idea of attempting to *design* such a cybernetic mechanism was questioned by some SCiO members, particularly those with strong links to Viable Systems Management (VSM). As I now understand their position (and my understanding could still be wide of the mark), they feel that any attempt to *design* such a system must fail. My impression is that they are arguing that what one needs to do is to allow a new system to emerge from the introduction of more effective educational processes – viable systems – into classrooms (and, elsewhere). Quite right. But what happens in classrooms is primarily determined by the network of systems forces portrayed in Figure 1. ... including the operation of the governance system depicted in the central box in that Figure. These processes drive out the very thing – effective education – on which their proposal depends. And this observation, of course, brings us back to the starting point for this article.

While all these discussions were in train, the (re) publication of Bookchin's *Ecology of Freedom* dramatically highlighted the importance of studying the social forces indicated in the sub-system box (labelled sociological demands) to the right of centre in Figure 1. It is this sub-system that has the survival of our species and planet in its grip.

Our 1995 map of the forces operating in this system is reproduced in the next Figure.

Diagram 20.6

Feedback loops perpetuating non-sustainable society

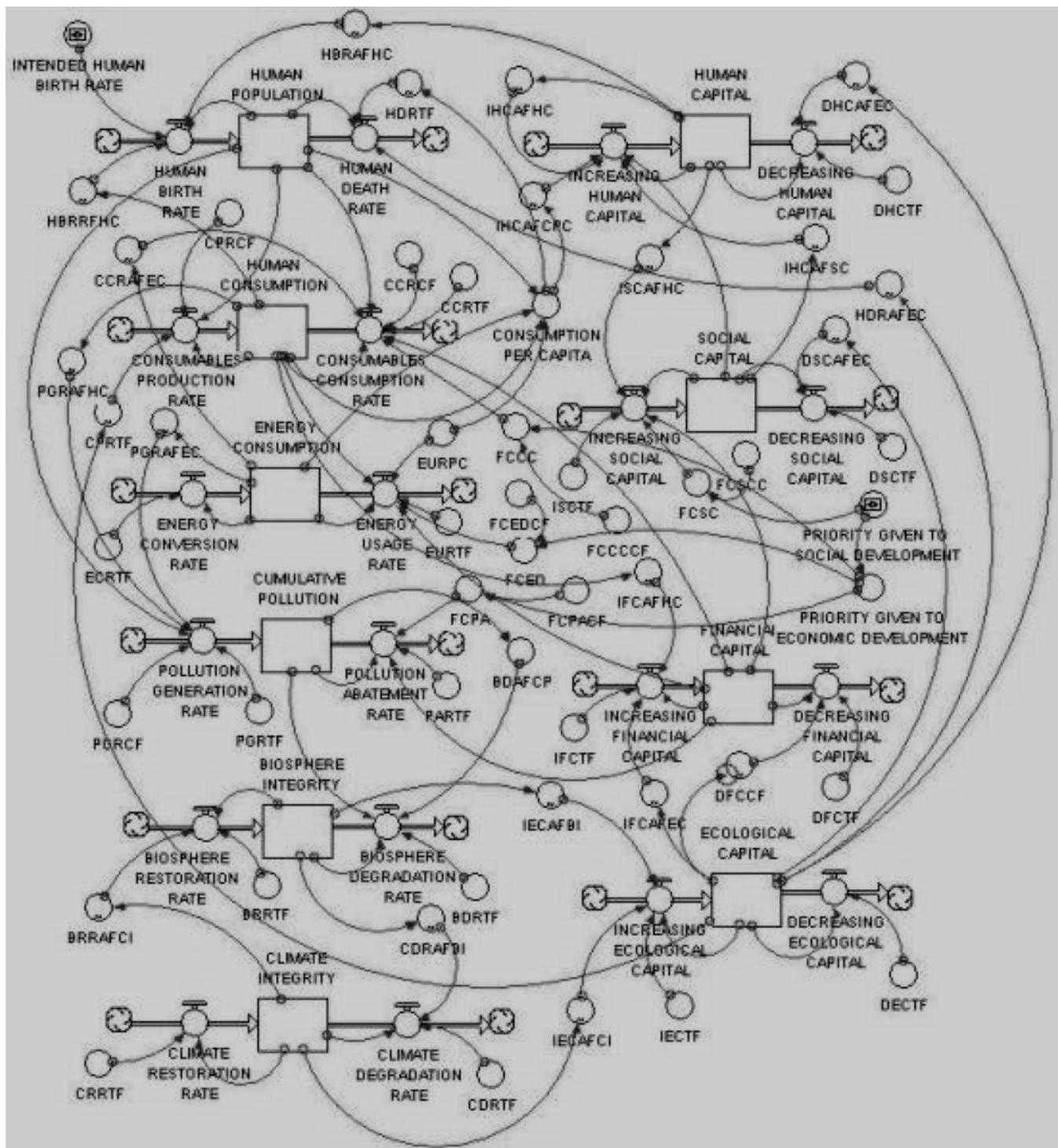


Version date: 8 September 2004. John Doctemp/Jean ODDMENTS file: FLPNS.\*\*\*

**Figure 4**  
Feedback Loops Perpetuating a Non Sustainable Society.

An enlargeable version of this diagram is available at:  
<http://www.eyesociety.co.uk/resources/diagram%2020.6.pdf>

So Luciano and I turned our attention to this box. It is now quite clear that it is vital to re-draw and complete this map using the tools perhaps best illustrated in the next diagram.



**Figure 5**

**STELLA World Model**

**STELLA Flow Diagram of SDSIM Version 1.0**

**RECTANGLES are LEVELS (cumulatives), VALVES are RATES (flows),  
CIRCLES are variables or constants used to formulate the RATES as functions of the LEVELS  
at TIME = t for the iteration t+dt, where t=1950, 1951, .... 2199, 2200 and dt=1**

An enlargeable version of this diagram is available at:

[http://www.eyesociety.co.uk/resources/STELLA\\_Flow\\_Diagram\\_of\\_SDSIM\\_Version\\_1.pdf](http://www.eyesociety.co.uk/resources/STELLA_Flow_Diagram_of_SDSIM_Version_1.pdf)

Having said that, it is, however, of the greatest importance to note that these systemograms fail to indicate the relative strength or importance of the various feedback loops involved. Put another way, they fail to indicate the relative strength of the forces involved in a manner analogous to the way in which Forrester and Meadows were able to indicate the relative impact of the variables included in their world model.

Mapping this network – and transforming it into a socio-cybernetic model (as distinct from a mere systemogram) – would be an enormous task. It certainly could not be accomplished without substantial funding. Yet the importance of doing it *well* cannot be underlined too strongly. Reliance on incomplete models has, in the past, led to grave policy errors. An incomplete and misleading map could thus be *worse* than useless.

So now it is clear that the aim of this paper must be, not just to solicit help in advancing the conceptual framework that has been emerging, but, still more importantly, to seek your help in securing the funding needed to take it forward.

### Acknowledgements

Besides being indebted to Luciano Gallon, I must also acknowledge my indebtedness to the SCiO members who turned up for Development Days and Aidan Ward in particular.

### References

- Beer, Stafford (1975). *Platform for Change*. London: John Wiley
- Bertalanffy, Ludwig von (1968/1976) *General System theory: Foundations, Development, Applications*, New York: George Braziller
- Bookchin, M. (1991/2005). *The Ecology of Freedom: The Emergence and Dissolution of Hierarchy*. Oakland, CA: AK Press.
- Forrester, J. W. Counterintuitive Behavior of Social Systems (D-4468-2)  
An introduction to the concepts of system dynamics, discussing social policies and their derivation from incomplete understanding of complex systems.  
<http://clexchange.org/ftp/documents/Roadmaps/RM1/D-4468-2.pdf>
- Harich, J. (2010). Change resistance as the crux of the environmental sustainability problem. *System Dynamics Review*, 26(1) (January–March 2010), 35–72. Published online 14 January 2010 in Wiley InterScience (www.interscience.wiley.com) DOI: 10.1002/sdr.431 [http://www.eyeesociety.co.uk/resources/Harich\\_Fig\\_3.pdf](http://www.eyeesociety.co.uk/resources/Harich_Fig_3.pdf)
- Lane, R. E. (1991). *The Market Experience*. New York: Cambridge University Press.
- Marks, N., Simms, A., Thompson, S., & Abdallah, S. (2006). *The (Un)happy Planet Index: An Index of Human Well-being and Environmental Impact*. London: New Economics Foundation. Downloadable from [www.neweconomics.org](http://www.neweconomics.org) and [www.happyplanetindex.org](http://www.happyplanetindex.org)
- Meadows, D. H., Meadows, D. L., & Randers, J. (2008).  
[www.Vensim\models\sample\WRLD3-O03\World3\\_03\\_Scenarios.wmfView](http://www.Vensim\models\sample\WRLD3-O03\World3_03_Scenarios.wmfView)
- Meadows, D. H., Meadows, D., & Randers, J. (2004). *The Limits to Growth: The 30-Year Update*. London: Earthscan Ltd.
- Raven, J. (1994). *Managing Education for Effective Schooling: The Most Important Problem Is to Come to Terms with Values*. Unionville, New York: Trillium Press. [www.rfwp.com](http://www.rfwp.com); Edinburgh, Scotland: Competency Motivation Project, 30, Great King Street, Edinburgh EH3 6QH. First chapter, followed by most of the others, is available at <http://eyeesociety.co.uk/resources/MEFESChap1.pdf> or, better:

[http://www.eoswiki.co.uk/wiki/index.php/Managing Education For Effective Schooling : Chapter 1](http://www.eoswiki.co.uk/wiki/index.php/Managing_Education_For_Effective_Schooling:_Chapter_1)

Raven, J. (1995). *The New Wealth of Nations: A New Enquiry into the Nature and Origins of the Wealth of Nations and the Societal Learning Arrangements Needed for a Sustainable Society*. Unionville, New York: Royal Fireworks Press [www.rfwp.com](http://www.rfwp.com); Sudbury, Suffolk: Bloomfield Books. Chapter 1, followed by most of the other chapters, are available at <http://eyeonsociety.co.uk/resources/NWNChap1.pdf> or, better, [http://www.eoswiki.co.uk/wiki/index.php/The New Wealth of Nations: Chapter 1](http://www.eoswiki.co.uk/wiki/index.php/The_New_Wealth_of_Nations:_Chapter_1)

Raven, J., & Gallon, L. (2010). Conceptualising, mapping, and measuring social forces. *Journal of Sociocybernetics*, 8, 73-110.  
[http://www.eyeonsociety.co.uk/resources/scio\\_unpublished.pdf](http://www.eyeonsociety.co.uk/resources/scio_unpublished.pdf)  
<http://eyeonsociety.co.uk/resources/scio.pdf> (Currently all the papers comprising that issue of the Journal come up on response to the second link, but we may be able to fix this before this article is published.)

---

### Endnotes

<sup>1</sup> [http://www.eyeonsociety.co.uk/resources/scio\\_unpublished.pdf](http://www.eyeonsociety.co.uk/resources/scio_unpublished.pdf)

<sup>2</sup> Readers unfamiliar with earlier discussions of this topic at SCiO meetings might find it useful to have a look at that paper (by clicking the link cited above or in the references section) before proceeding.

<sup>3</sup> See Raven (1994)

<sup>4</sup> see discussions in Raven & Gallon and other articles.

<sup>5</sup> Bookchin, M. (1991/2005) (See <http://www.eyeonsociety.co.uk/resources/Bookchin.pdf> for a summary and critique.)

<sup>6</sup> See Robert E Lane (1991), Marks et al (2006).

<sup>7</sup> Society for the Study of Systems Thinking and Cybernetics in Organisations.

<sup>8</sup> Beer (1975).

<sup>9</sup> Research Committee 51 (Sociocybernetics) of the International Sociological Association.

<sup>10</sup> see <http://www.eyeonsociety.co.uk/resources/forrester2.pdf>

<sup>11</sup> [http://www.eyeonsociety.co.uk/resources/STELLA Flow Diagram of SDSIM Version 1.pdf](http://www.eyeonsociety.co.uk/resources/STELLA_Flow_Diagram_of_SDSIM_Version_1.pdf)

<sup>12</sup> <http://www.eyeonsociety.co.uk/resources/NWNChap19.pdf>

<sup>13</sup> The importance of re-visiting this issue has recently been underlined by a special issue (2011) of *The Good Society*, vol. 20, no 2 and by a paper presented by Bernd Hornung at the 2012 meeting of RC51 (for which this paper was initially prepared). Hornung presented data from the Marburg hospital system that clearly showed that traditional Weberian images of effective bureaucratic management are entirely inappropriate in modern society ... but no alternative images of how to deal with complexity, technical innovation, and mushrooming “demand” are available. (As shown in *The New Wealth of Nation*, myths of management through the marketplace are also largely without foundation.)