

Some abuses of “science”, logic, and authority illustrated from responses to the COVID-19 threat

John Raven

Version date 06 June 2022

Abstract

This paper sets out to illustrate some common, but vitally important, abuses of “science”, logic, and authority as they have occurred in responses to COVID-19.

Given that the massive disruption we have endured was caused, not by the virus itself, but by a network of international policies justified in its name, it has been an abuse of science to focus “scientific” research predominantly on the virus.

In other words, it has been an abuse of “science” to fail to give equal weight to the study of the multiple outcomes of the lockdown and related policies that have been introduced with a view to slowing the spread of COVID-19.

*These abuses highlight the widespread acceptance of the thought-way which leads to the word **science** being equated with **reductionist** science.* That is, they reflect the pervasive assumption that studies which fail to situate themselves in a systemic context can nevertheless legitimately claim to be “scientific”.

Beyond that, it has been an abuse of authority to mandate medieval notions of how to stem the spread of the virus.

These things reflect extraordinary tunnel vision (lack of systems/systemic thinking) on the part of decision makers, scientists, and the general public.

Unfortunately, this is not confined to COVID. Numerous obscene educational and environmental policies are also supported by reference to equally flawed, non-systemic, reductionist, "science".

It emerges that there are four central tasks for sociocyberneticians:

1. To disseminate awareness of the implications of “systems thinking” for the prevalent image of “science”.
2. To generate alternative models for societal governance ... viz cybernetics writ large.
3. To generate a socio-cybernetic understanding of how it came about that essentially the same (largely destructive) processes were implemented by most governments virtually overnight.
4. To study the nature and diffusion of the mental viruses that have played such a major role in the dissemination of this and other policies.

This paper set out to illustrate some common, but vitally important, abuses of “science”, logic, and authority as they have occurred in responses to COVID-19 and especially in the Dynamic Systems Models being used by policy consultants.

However, in the process of shortening it to fit into the space available, much of the material relating to systems dynamics has been omitted. Readers interested in this material should refer to Raven (2020, July).

Furthermore, as it turns out, by way of illustrating the abuses of “science” I have added little to what I said in my 2017/2019¹ papers on the pervasive and pernicious effects of neglecting systems thinking. (The latter is a substantial document which merits attention in its own right.) On the other hand, I have added some additional questions about how we, as a world society, came to be subject to a network of world management systems² which have had such disastrous³ effects.

These other questions include:

- What have we, as sociocyberneticians, to contribute to understanding what happened and how a similar disaster might be avoided in the future? How are we to conceptualise, map, and harness the social forces involved?
- How are we to understand the extraordinary role played by some internationally-disseminated thoughtways (forms of “tunnel vision”; “mental viruses”; memes) associated with COVID and Lockdown? How did/do they get created and disseminated? What are their effects – such as totalitarianism – likely to be? How do these things recursively affect each other?
- What have we to contribute to understanding the ease with which politicians (and others) are able to create, or focus attention on, one threat or another and lead their populations to march toward self-destruction with a view to eradicating the “evil”?
In this case, it has been terrifying to see how easy it has been for them, on a worldwide basis, to orchestrate a whole panoply of activities along these lines. These have ranged
 - from the lockdown of physical movement {accompanied by such things as daily testing and monitoring of contacts}
 - through the censorship of information and discussion relating to compulsory vaccination {again carried out in an information-vacuum characterised by censorship and misinformation}
 - to the sequestration of bank accounts and property without due legal process in response to protest against the measures (Canada).but perhaps most unexpected and alarming of all has been the exposure of the extraordinary power of individual leaders to implement policies of their own personal choice despite the nominal powers of parliaments and the judicial system to restrain them⁴.

How has this come about: what have we, as sociocyberneticians, got to say about it? (Cybernetics is, after all about mapping and understanding the {largely invisible} feedback and control processes that operate in animals and machines).

- Then there are a network of questions relating to the social processes contributing to a drift toward totalitarian societies.
- But these questions in turn raise an interesting question about our possible role, as sociocyberneticians, in enhancing the public's acceptance of responsibility for the consequences of their actions.

Taking responsibility for personal actions may involve resistance to government directives.

Some of the actions to be resisted may at first sight seem relatively trivial - such as the need to resist directives to wear masks.

However, mask-wearing amplifies the climate of fear that has been crafted to induce compliance with other directives. And it facilitates acceptance of a series of actions in which the next steps are accepting mass test and trace systems, the compilation of centralised data banks of personal data, compulsory quarantining (of healthy as well as infected people), and eventually compulsory vaccination.

But others are very much more serious.

History teaches that the social consequences of failing to refuse to participate in actions that are said to be in the long-term public interest when (a) public debate about the basic question is forbidden and (b) the information needed to arrive at such a conclusion is not available, is misleading, or has been manipulated - and especially when it has been censored - are disastrous indeed.

- And there is also a somehow more basic scientific question:
How has preoccupation with experimental science – i.e. study of whether the effects of varying a single variable has had the predicted effects on a single outcome deemed to be important – somehow driven out multi factor systems thinking?

I will come back to these things later.

But let me turn first to what was meant to be the theme of this paper – namely to illustrate some of the abuses of science that have occurred among those “scientists” who have contributed so disastrously to this extraordinary enterprise.

My overall position is that

Given that the “pandemic” crisis was caused, not by COVID-19 itself, but by the international policies that have been justified in its name,

- It has been an abuse of science to focus “scientific” research predominantly on the spread of COVID-19 itself

- It has been an abuse of “science” to fail to study the multiple outcomes of the policies that have been introduced in the name of slowing the spread of COVID-19
- And it is an abuse of science to neglect contextual variables which affect all these outcomes.

But there are also endless more specific, but in the general scheme of things relatively trivial, specific abuses that are documented in my 2020 paper⁵.

Some of these have been rectified now, but in Spring of 2020, when I wrote the paper, they were pervasive and had a shocking impact on the discussions that contributed so much to the formulations of policy.

There was widespread

- Failure to examine the quality of the basic data and measures utilised.
- Failure to examine the validity of assumptions about causality.
- Failure to study recursive effects of using the outcomes predicted from “worst case” scenarios to create a climate of fear and panic which has recursively provoked a demand for ever more intrusive intervention.
- Failure to study/report the huge variation in outcomes (however defined) among different populations .. eg age groups and situations (such as care homes vs homes vs hospitals) and sub populations such as single-parent families cooped up in high-rise developments.
- Failure to study the wider effects of Lockdown policies (such as cancellation of orders for garments in the UK on starvation, destitution, and death in such places as Bangladesh).
- Failure to relate to on-the-ground contexts.

To illustrate this: At a Systems Dynamics webinar⁶, Kim Warren drew attention to some of the implications of the different conditions that exist in two adjacent districts of Mumbai.

In the crowded slum district there is no possibility of implementing quarantine and social distancing, lockdown would mean that people would starve due to lack of income, and restriction of travel would mean that people could not travel to the adjacent wealthy district to find work.

And the monsoon has dramatically different effects.

As Pruyt indicated in the same symposium (and also in an important book⁷) one implication of this is that *one needs, not just a single model of the way the virus spreads and the effects of interventions, but a range of models suited to different contexts.*

In point of fact, as also illustrated by Pruyt, models are widely misused by persons who do not understand basic assumptions that lie behind and/or are built into the models.

Pruyt also spoke of the need to experiment with the models to see if they yield conclusions which do not stand up to examination ... and, *if they fail, to change the models.*

More serious abuses of “science”.

The abuses I have in mind here arise from **failure to embrace what might be called systemic or ecological science.**

Or, put the other way round, from acceptance of reductionist science.

It is easiest to introduce a discussion of the problem by reference to the work of Vandana Shiva⁸ relating to pesticides.

She highlighted the disastrous consequences of failing to study and report the multiple outcomes of an intervention that is believed to be beneficial by drawing attention to the impacts on food chains and soil fertility of applying fertilisers and pesticides to increase crop yields

But, while many people readily accept the failure to report the negative effects of pesticides as an abuse of science, they are much less likely to accept essentially the same conclusion when it occurs in other areas of policy.

For example, Hattie produced a meta-analysis of 800 meta-analyses of “what works” in education. “What works” was defined as success on tests of such things as “reading” and “scientific ability”.

However, among the things that were not assessed in these studies was the fact that about one third of pupils are seriously damaged by the system.

How could one accept that studies which failed to report such an important outcome (equivalent to the destruction of the fertility of the soils) constituted acceptable *science*?

As in the case of the failure of the Lockdown studies to register serious negative effects, the neglect of these other outcomes was attributed (if it was noticed at all) to a deficiency in the *management* process rather than to a deficiency in the application of science.

More generally, the neglect of such outcomes reflects the tunnel vision – preoccupation with single outcomes – of (most of) those who offer the services, commission the research, and the researchers.

Be that as it may, their neglect is far from unimportant to many of the recipients of the services.

From a societal perspective it is if no one cares about them. (Just as no one cares about the destruction of the soils.)

The harms do not register in the decision-taking and policy-making process.

In reality, the feedback processes available to hierarchical/bureaucratic management are, in a sense, “designed” to eliminate such information.

I need to come back to that because designing alternative feedback and governance systems is a crucial task to be carried out by sociocyberneticians, but that is not the issue I want to pursue here.

One might similarly ask “Who cares about the fate of many – if not most – of those caught up in the Lockdown madness?”

Neglected groups include:

- those who fail to get treatment for other diseases because the hospital system is preoccupied with COVID.
- deaths in eg Bangladesh arising from cancellation of contracts for the manufacture of garments from the West.
- General destruction of the Indian agricultural economy

And, to put these in context,

- Even by the time I wrote my original article (the Spring of 2020), OECD/Ramos & Hynes⁹, and *Recovery* had shown that, worldwide, millions of people would die as a result of the Lockdown policies.
- More recently, the UN World Food Programme¹⁰ has shown that COVID-related hunger could kill more people than the virus.
- And Allen¹¹ has shown that worldwide, around 150 life-years have been lost for every life-year saved by Lockdown policies.

To digress a little. Although Allen’s main achievement has been to come up with a metric which enables costs and benefits to be set against each other, it is important to note that he is still working with a single variable deemed to be of overwhelming importance.

The real question for cyberneticians – and Allen has expressed his frustration about this – is how to handle multiple outcomes simultaneously, especially when many of them are not easily quantifiable.

But, to come back to my main theme:

As in education, there is endless evidence of these things, but it does not *register* in the decision-taking process.

Yet one would imagine that it is the very purpose of “scientific” evaluation to record such outcomes of interventions.

In other words, failure to register them arises, at least in part, from deficiencies in the *scientific* process

Bhattacharya¹² has argued that neglect of such outcomes is to be understood as a failure in the *political* system (which, he argues, has a responsibility to consider what is best for society as a whole).

While this is undoubtedly true,

this is *not* what I am arguing.

I am arguing that it *arises from image of science in which it is not considered necessary to contextualise (experimental) relationships and present them in a context of the other, positive and negative, relationships that are inherently involved.*

This position needs to be central to the argument of those who advocate systems thinking i.e. those who seek to present relationships in the context of *networks* of relationships ... many of which have recursive and transformative feedback loops.

At this point I need to go on what I hope will be an informative digression.

Many of the problems faced by those who seek to implement conclusions based on reductionist science stem from neglect of Forrester's law¹³.

Forrester's law states that single-factor intervention in poorly understood complex systems always has counterintuitive, and usually counter-productive, effects as the system reacts to the intervention in such a way as to maintain its integrity.

From this it follows that many of the conclusions drawn by those who practice reductionist science cannot claim to be "scientific" because they fail to document many of the – often the most important – outcomes of the intervention.

To support a claim to be "scientific" – and especially if they are to claim to support "evidence-based policy" – it is necessary for researchers to document *all* the effects of interventions.

Contrary to the most widely accepted assumptions about what needs to be done to advance understanding via experimental and theoretical science (which revolve around studying the effects of varying something [a single variable] on a pre-specified outcome [assumed to be important from a theoretical or practical point of view]), to be acceptable as scientific assessments of the effects of experimental interventions must strive to be ***comprehensive***.

That is, it is necessary to strive to document *all* the

- short and long term,
- intended and unintended,
- desired and desirable, and
- undesired and undesirable

effects of the interventions in different (social) contexts.

[In practice the "experimental" variable deemed to have been manipulated (such as class size) is itself often contaminated by co-varying other variables.]

Otherwise the reported results corrupt the advance of understanding.

At a practical level,

- what is good in the short term may be bad in the long term;
- what is good for the individual may be bad for society.

Focussing only on the magnitude of intended effects (as legitimised by conventional, over-simplistic, images of theoretically-based “experimental” science) may lead to failure to study seriously undesirable unintended consequences.

This can not only lead to disastrous policies, it also confuses the issues ... i.e. undermines understanding ... and thus constitutes bad science.

To re-state the above as a conclusion to this section: *it is the responsibility of the modellers of social, biological, and epidemiological processes, qua scientists, to do their best to include indices of all possible outcomes.*

But now to take up other issues raised at beginning of this paper

1. How are we to understand the extraordinary role played by some internationally-disseminated thoughtways (forms of “tunnel vision”; “mental viruses”; “memes”) associated with COVID and Lockdown? How did/do they get created and disseminated?

As time has gone on, I have become more and more intrigued by the role played by “catch phrases” or slogans which spread across national boundaries like wildfire with dramatic effects.

Shiva refers to them as components of monocultures of mind.

They include thoughtways about how to “do” science, agriculture, education, (economic) “development”, and safetyism (government has a duty to protect me from all harms).

They have emergent, self-perpetuating, self-elaborating, and self-extending properties and they interact with each other to have dramatic effects.

In the case of COVID and Lockdown they also have the extraordinary property of appearing to be locally generated.

The fear component in reactions to COVID, while deliberately amplified by government policies, seems to be linked to the rise of the “safeism” meme ... “I have a right to be protected against all harms” ... that has resulted in an extraordinary expansion of the range of activities now designated as “hate crimes” and leads to demands for protection from an ever-expanding range of adverse experiences (ACEs).

Both are somehow associated with an indifference to the rise of totalitarianism. “I don’t care about freedom so long as I am safe”.

Equally terrifying has been the way in which the pervasive fear of infection has recursively built on and enhanced the culture of de-platforming and “cancelling” that has been visited upon would-be dissidents and heretics.

Although Sumption¹⁴ has provided an extraordinary account of the UK government's abuse of its authority and the links to public fear and drift to totalitarianism, understanding these things involves understanding the social forces which control the operation of society and thus falls within the domain of sociocybernetics as the study of networks of hidden social forces which control the operation of society.

As an aside, it seems to me not coincidental that both the biological COVID-19 virus and the meme relating to how to fix it should have emerged in a regime which is notorious for imposing draconian policies in pursuit of single-value outcomes regardless of their collateral damage (consider the "cultural revolution" and the millions of deaths which ensued and the current quest for "economic development" regardless of the ecological consequences).

Whatever about that, it has been terrifying to see the way in which governments around the world have been able to both recruit local "scientists" who produce evidence to support these externally-generated memes and policies and stifle open discussion in the scientific community.

Through what sociocybernetic process does this come about?

2. Turning to the next of the issues I raised at the beginning and left to take up later: the ease with which politicians (and others) are able to focus attention on one (often imaginary) threat or another and lead their populations to march toward self-destruction in a quest to eradicate it.

How does this come about? What have we, as sociocyberneticians, got to say about it? (Cybernetics is, after all, about making explicit the feedback and control processes that operate in animals and machines).

Very early on in our work¹⁵ it had emerged that the evolution of alternative perceptions of, and arrangement for, governance is central to resolving many of the problems we face.

The fundamental need is to create a *learning society* – that is, one which innovates and learns without central direction.

Such arrangements would be inherently organic, having – as in the internal body-management processes of animals – many feedback loops. As such they differ radically from hierarchical management.

Unfortunately, virtually all attempts to move in this direction have, over endless millennia, been stifled by what Bookchin¹⁶ has called "the inexorable onward march of hierarchy".

We have made little progress in our attempts to understand this.

I must therefore, as so often before, content myself with calling for help from the participants in this webinar.

3. The network of questions relating to the social processes contributing to an apparent drift toward totalitarianism.

“Safe distancing”, quarantine, and lockdown policies have, intentionally or otherwise, made it virtually impossible to communicate with one another except by electronic means.

This has closed most of the traditional channels through which public opinion was formulated and refined and reached decision takers.

Beyond that, government directives have led social media platforms like Twitter, Youtube, and Facebook first to employ thousands of people to delete posts containing information which does not support official policy and then to the deployment of algorithms to the same end.

This has combined with a horrifying use of the social media to de-platform and “cancel” people whose views do not accord with those of self-righteous, virtue-signalling, members of the public. (It is only necessary for someone to say that he or she has been offended by some post for all the harpies from hell – aided and abetted by new laws – to descend upon the “offender”).

In this context, the silence of organisations nominally concerned with civil liberties has been extraordinary.

One cannot imagine any system better calculated to precipitate the arrival of a totalitarian state.

Combined with mandatory state monitoring of one’s health and movements through electronic contact tracing, CCTV deploying face recognition, and drones to monitor social gatherings, it is hard to imagine that we have not drifted into an extremely dangerous social situation.

And the feeling becomes stronger as pressures mount to eliminate hard currency and move toward electronic payments “to avoid the dangers of passing on the virus on the surface of coins”. Yet any such move provides the state with the means to monitor all transactions – including payments to disapproved recipients such as “prostitutes” and “subversive” organisations.

4. These issues raise an interesting question about our possible responsibility, as sociocyberneticians, to do what we can to enhance public acceptance of responsibility for the consequences of their actions.

As mentioned earlier, some of the requisite actions – such as the wearing of masks – may appear relatively trivial but, on closer examination, turn out to be more serious.

But others are much more serious.

History teaches that the social consequences of failing to refuse to participate in actions that are said to be in the long-term public interest when

(a) public debate about the basic question is forbidden and

(b) the information needed to arrive at such a conclusion is not available, is misleading, or has been manipulated - and especially when it has been censored –

have facilitated some of the most disastrous social policies ever.

I have been surprised at how few have articulated this position¹⁷ and appalled at the conspicuous absence of civil rights movements in promoting it.

Civil rights and related organisations seem to have been too easily convinced by the long-term public-interest meme that has been so widely accepted – almost without question – on an international basis.

Very few¹⁸ have drawn attention to the way in which failure to resist leads to totalitarianism.

Actually, I am not sure that many even recognise the problems which totalitarianism poses.

On the contrary the support for these processes seems linked to a pervasive fascism which has come to characterise our society.

This pervasive fascism expresses itself as a desire, and willingness to impose (by force if necessary) that which one deems to be good and right on others regardless of the wishes of those others and the long-term consequences for society.

It seems that those who have been most vociferously promoting the Stay-at-home, Safe-Distancing, and Quarantine meme (which has been around since the middle ages with little evidence of its effectiveness) are those who have been most affected by the Safeist (it is the government's job to arrange for me to be protected from all adverse experiences) meme. Many seem to have become "snowflakes" unable to tolerate, or recover from, threat perhaps precisely because they have been shielded from adverse experiences and, as a result, failed to develop the capacity to tolerate and overcome them. They have become predisposed, through a recursive process, to calling for the *extension* of the Lockdown and related policies - thereby enhancing the perceived threat. Moreover, like those who have promoted other extremist memes (like the persecution of religious non-believers, witches, heretics, and those accused of incorrect political thoughtways [China]), they have been predisposed to taking the punishment of transgressors into their own hands by pouring abuse on them through the social media, depriving them of the right to speak via that media, or by snitching on them to "authorities".

And so we come back to our question:

What have we, as sociocyberneticians, got to say about how cultivate resistance to mental viruses, especially when these are nominally supported what are presented as "scientific" studies?

It seems to me that a key component in so doing has to do with the cultivation of a scientific *attitude* – a disposition to ask "What is the evidence for assertions that are made?"

Unfortunately, I have encountered what I can only describe as the strongest possible resistance to this position.

A concern to convey what are believed to be "the facts" drives out any desire to question them.

Thus cultivating such an attitude would require radical reform of the way "science" is taught in schools and universities.

5. How has preoccupation with experimental science – i.e. study of whether the effects of varying a single variable has had the predicted effects on a single outcome deemed to be important – somehow driven out multi-factor systems thinking?

Cultivation of a predisposition to ask for empirical evidence that a statement about a causal relationship is true lies at the heart of the transformation in thoughtways characterised a “the enlightenment”.

It leads directly to support for hypothetico-deductive methodology.

But the main reason for support for “the scientific method” is quite other.

It is that *it works*. It yields enormous benefits.

But the fact that those benefits come at a, largely invisible, cost is typically ignored.

Pesticides confer benefits ... but at what cost? Steam engines confer enormous benefits ... but at what cost to societal arrangements?

Insisting that these ancillary costs and benefits be made explicit is the key demand to be made by those calling for the embracement of *systemic* (as distinct from reductionist) science

This summary is good (and contains additional information on governance) but probably unnecessary.

SUMMARY AND CONCLUSIONS

Especially given that the current crisis has not been caused by COVID-19 itself but by the international policies that have been justified in its name, it has been an abuse of science to focus “scientific” research predominantly on the spread of COVID-19 itself.

It has been an abuse of “science” to fail to study the multiple outcomes of the policies that have been introduced in the name of halting the spread of COVID-19.

And it is an abuse of science to neglect contextual variables which affect all these outcomes.

*These abuses highlight the widespread acceptance of the thought-way which leads the word **science** to be equated with **reductionist** science.*

In other words, they reflect the pervasive assumption that studies which fail to situate themselves in a systemic context can nevertheless legitimately claim to be “scientific”

It is therefore disturbing that most of those who have prided themselves on developing system dynamic models of the flow of the biological virus itself have ignored the systemic context.

Beyond that, it has been an abuse of authority to impose what have (correctly) been described as medieval notions of how to stem the spread of the virus on the populations of the world.

These things reflect a predisposition toward what can only be described as extraordinary tunnel vision (lack of systems/systemic thinking) on the part of decision makers, scientists, and the general public.

In view of its consequences, such authoritarian activity merits the strongest resistance.

Unfortunately, a huge number of obscene educational and environmental policies are supported by reference to equally flawed, non-systemic, reductionist, "science".

If research is to be used to guide policy that research must be *comprehensive*.

It must deal with *all* personal and social, intended and unintended, desired and undesirable, short and long term outcomes of proposed policies.

What is good for an individual may be bad for other individuals and society¹⁹.

But what are the implications of this extraordinary abuse of authority for the decision-taking, governance, process itself?

Currently, we have what John Stuart Mill and Adam Smith described as government by committees of ignoramuses; government by people not only do not know, but *could not*²⁰ know, what they need to know to take wise decisions.

Rectifying that defect requires very different forms and images of governance.

It depends on evolving alternative answers to Smith's question about how to create a society which will innovate and learn without central direction. The requisite arrangements are *organic*, having multiple feedback loops, rather than hierarchical. Unfortunately moves in this direction over many millennia have been undermined by what Bookchin has called the inexorable onward march of hierarchy. Generating an understanding of how this hierarchy-promoting process works must be a central objective for sociocyberneticians.

As I see it, we are left with four central tasks for sociocyberneticians:

1. To disseminate the implications of "systems thinking" for the prevalent image of "science".
2. To generate alternative models for societal governance ... viz cybernetics writ large.
3. To generate a socio-cybernetic understanding of how it came about that essentially the same (largely destructive) processes were implemented by most governments virtually overnight.
4. To study the nature and diffusion of the mental viruses that have played such a major role in the dissemination of this and other policies.

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ENDNOTES

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- ¹ Contribution to RC51 conference, 2017, and Raven, J. (2016/19).
- ² It has only recently, and in the context of proposals to amend that treaty (see “[The Biggest Global Power Grab We Have Seen in Our Lifetimes](#)”: How Serious is the Threat From the WHO Pandemic Treaty?), that have I learned of a 2005 WHO treaty in this area. This has been a great surprise to me in that it has been widely reported that, until 2020, WHO guidance relating to how to respond to a possible COVID pandemic specifically discouraged lockdowns.
- ³ The scale of that disaster was already evident from materials cited in an earlier version of this paper [Raven, J. (2020)], although that paper, like the current one, was not written with the intention of reviewing evidence of the effectiveness of policy but rather to examine the methodology. However, the extent of the disaster emerging from the authoritarian quest to deploy a vaccine to eliminate the disease had yet to emerge. For a retrospective summary of the evidence that “nothing works” see Bhattacharya (2022). As in 2020, the overwhelming question for sociocyberneticians was, and is, to account for the extraordinary abuse of science and authority that has occurred and take steps to prevent its recurrence.
- ⁴ An account of the extraordinary way in which the UK government has evaded and ignored all constitutional and judicial constraints has been provided by Lord Sumption (Sumption, 2020).
- ⁵ Raven, J. (2020, July).
- ⁶ <https://www.youtube.com/watch?v=jywqMIbNuvY>
- ⁷ Pruyt, E. (2013).
- ⁸ Shiva, V. (1993, 1998).
- ⁹ OECD/ Ramos & Hynes (2020).
- ¹⁰ UN food program (2020).
- ¹¹ Allen, D. W. (2022).
- ¹² Bhattacharya, J. (21/11/2021).
- ¹³ Forrester, J. W. (1971/1995).
- ¹⁴ Sumption (2020).
- ¹⁵ Raven, J. (1994, 1995)
- ¹⁶ Bookchin, M. (2005).
- ¹⁷ Among other things, it leads inexorably, to conscientious objection to vaccination until major questions have been answered.
- ¹⁸ An exception being Lord Sumption who delivered a number of lectures and Youtube discussions and especially an extraordinary talk on the abuses of authority and other issues raised in this article to the Cambridge Law Faculty (Sumption, 2020).
- ¹⁹ Starting from the, mainly reductionist, “science” currently available and the image of science that is widely embedded in people’s minds, the time and costs involved in conducting such research would be enormous. But, as is evident from what has been said in this article, the costs of *not* doing it are even more enormous. But what would be entirely feasible would be to require “scientists”, first, to take steps to orientate their research proposals and designs toward more comprehensive, more systemic, ways of thinking, and, second, to list, in their already mandatory sections on “limitations of the study” a discussion of what is *not* there and the implications that would follow if it had been there. More generally, there is an urgent need to radically reform the way research is funded and evaluated and the way science is taught in schools. As the field became peppered with more comprehensive and systemic studies the task of moving forward would become less daunting.
- ²⁰ Adam Smith observed that if two people who were unknown to each other initiated innovative activities in separate places no one could tell beforehand what would happen as the developments came together. In other words, the key information needed to take wise decisions not only is not, but cannot, be available. All one can do is set up a system which will innovate, learn, and evolve on its own, without central direction in response to the information that is available in the hearts, heads, and hands of billions of people.