
ESSAYS IN REGULATION

To ‘see’, or not to ‘see’: that is the question

Moving on from a half-brained system of economic
governance

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Preface

The underpinning thesis of this Essay is that practically useful knowledge concerning economic governance, and governance more generally for that matter, can be acquired by study of the structure and functioning of the human brain. The arguments have some resonances with, inter alia: the ancient *microcosm-macrocosm analogy* in philosophy, the brain being the microcosm and the governance system ('Leviathan's brain') being the macrocosm; the Apollo/Cassandra story in Greek mythology; and much more recent mathematical analysis of self-similar systems, most notably in relation to fractals. They lead us to call for a new and better 'Gestalt' when thinking about the organisation of the structure and conduct of economic policy.

The arguments follow a path already beaten in the development of AI, in the course of which major advances have been made via the study of neural networks and their use as analogies and sources of insight. No similar path has been trod in thinking about governance: as the 2nd President of the United States put it in his own time, the science of government has been "*at a stand*".

The underpinning ideas have been put at recent conferences of the Regulatory Policy Institute at Oxford in December 2022 and in Westminster in May 2023. We have been encouraged by the receptions the arguments have received on those occasions and in discussions with individual academics and public policy professionals in Britain and elsewhere.

The significance of a network's topology for overall system performance will be obvious for anyone familiar with systems analysis, whether applied to physical or social systems. Contemplation of the workings of a car is sufficient to indicate that overall system performance depends not only on how well component parts function individually, but also how they connect and work alongside each other. More novel is the suggestion that the network topology of the human brain can be a fruitful source of analogies and metaphors in developing better understandings of the functioning of systems of economic governance. It is therefore the idea that we focus on.

Addressing the governance/stewardship/management of highly complex systems almost necessarily requires a collective effort and any list of individual acknowledgments would be long and tedious. We do, however, want to single out two. The first is Dr Iain McGilchrist, on whose extensive examinations of the relevant microcosm, the human brain, we rely very heavily. Since our interest lies in a narrower macrocosm than Iain's (his might be characterised as 'everything that is out there'), he should not be held responsible for any nonsenses that might be found in the political economy and public policy sections of the Essay. The second is Gerard Fox, our colleague in the Regulatory Policy Institute's Insights Team. A number of points in the Essay flow directly from blogs published by that team, to which Gerard has made major contributions.

Harold Hutchinson

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4 July 2023

ABSTRACT/SUMMARY

Both the human brain and a system of governance can be ‘seen’ as information discovery, information processing, and decision-making systems (information and action systems, or “*IASs*”, for short). By ‘seen’ is meant envisioned and examined in the mind, whether consciously or sub-consciously. Each of the two *IAS* systems is characterised by a division of labour. In the brain, an outstanding example of this is the lateralisation (specialisation) of the left (LH) and right (RH) hemispheres. The hemispheres attend to incoming information in different ways, the LH with a narrower, focused field of interest, the RH with a much wider vision of the external environment. The differences are, in part, mediated or synthesised via an interconnecting super-highway (the corpus callosum). There is no corresponding lateralisation in the governance system, with the immediate implication (on Adam Smith’s core propositions about the effects of a division of labour) that the ‘productivity’ of government might be expected to be significantly lower in consequence. In the absence of a lateralised RH, which builds up a wide picture (an initial Gestalt) much information that is relevant to the evaluation of alternative courses of action is simply not ‘seen’. What emerges is akin to LH dominance in the individual brain, the effects of which are illustrated via a discussion of the evolution of thinking in political economy since Smith’s time. In extreme forms it can be characterised as super-dominance, arguably personified in the Greek myth of Apollo and Cassandra. The absence of a lateralised part of a governmental system (“Leviathan”) devoted to the functions performed by the RH of the human brain leads us to characterise Leviathan as ‘half-brained’. Some immediate implications for public policy are discussed, as are some of the major obstacles that can be expected to stand in the way of improvement in the face of entrenched ways of thinking and doing. Those obstacles are the bad news. The good news is that not only is the network topology of Leviathan’s brain much more amendable to modification than that of the human brain, but also the implied modifications can be expected to have at least some, immediately beneficial effects on system performance. The last point follows from two core propositions in economics: decisions are heavily influenced by expectations of the future and those expectations can change very quickly, particularly when something is suddenly ‘seen’ which has not been ‘seen’ before.

Pensées

This twofold nature of man is so evident that some have thought that we had two souls.

Blaise Pascal: Pensées

Philosophy is the science of the connecting principles of nature. Nature, after the largest experience that common observation can acquire, seems to abound with events which appear solitary and incoherent with all that go before them, which therefore disturb the easy movement of the imagination; which makes its ideas succeed each other, if one may say so, by irregular starts and sallies; and which thus tend, in some measure, to introduce those confusions and distractions we formerly mentioned. Philosophy, by representing the invisible chains which bind together all these disjointed objects, endeavors to introduce order into this chaos of jarring and discordant appearances, to allay this tumult of the imagination, and to restore it, when it surveys the great revolutions of the universe, to that tone of tranquility and composure, which is both the most agreeable in itself, and most suitable to its nature.

Adam Smith: History of Astronomy

While all other sciences have advanced, government is at a stand; little better practiced now than three or four thousand years ago.

John Adams: 2nd President of the United States, in a letter to Thomas Jefferson

[The master-economist] *must contemplate the particular in terms of the general ...*

John Maynard Keynes: Essays in Biography, 'Alfred Marshall, 1842-1924'

Why did nobody see it [the 2008 financial crash] coming?

Queen Elizabeth II, on a visit to the London School of Economics

The idea of a Gestalt is central to this book: by which I mean the form of a whole that cannot be reduced to parts without the loss of something essential to its nature.

The experience of understanding involves a shift from what seems initially chaotic or formless, to a coherent stable form or picture, a Gestalt – or from an existing Gestalt to a new and better one, that seems richer than the one it replaces.

Iain McGilchrist: The Matter with Things

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1. Introduction

The stimulus for this essay lies in a few, related questions. Why do similar mistakes appear to be repeated over and over again in the conduct of economic policy? Why does there appear to be so little error-learning/learning-from-experience in this domain of human activity? Why does knowledge and the application of knowledge in these matters appear not to progress cumulatively in the manner of the physical sciences?

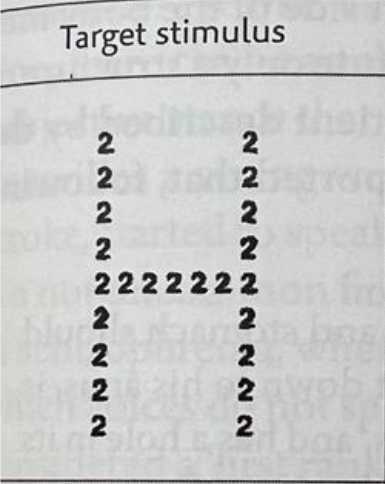
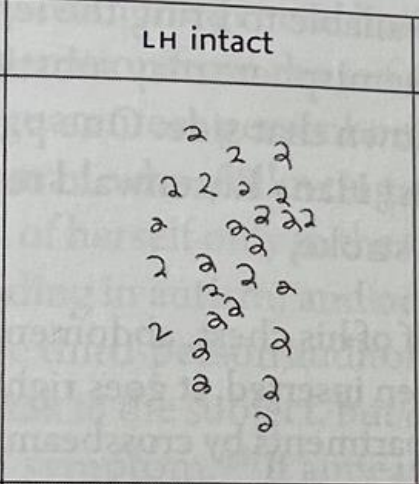
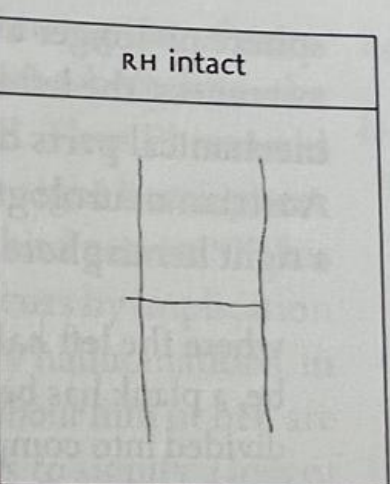
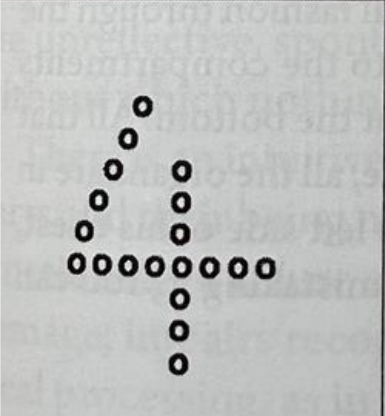
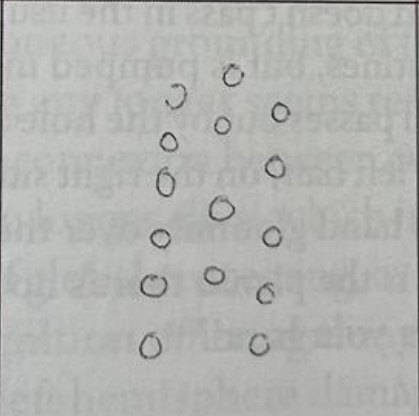
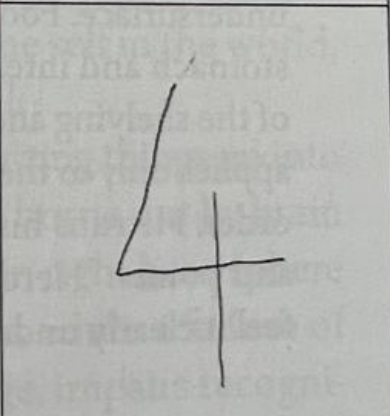
Many factors are no doubt relevant in developing answers to these questions, but the specific area we seek to explore concerns the structure of the neural networks of the human brain, the basic topology of which has changed only very slowly over long periods of time. Since a persistent phenomenon suggests the presence of a relatively unchanging ‘causal’ factor, this seems to be a good place to start, recalling that David Hume was of the view that *“Mankind are so much the same, in all times and places, that history informs us of nothing new or strange in this particular. Its chief use is only to discover the constant and universal principles of human nature.”*

Both the socio-political arrangements for the making of collective decisions/choices in government and the functioning of the human brain can be viewed as information processing and decision-making systems (information and action systems, or *“IASs”* for short) that are characterised by a ‘division of labour’. By the word ‘system’ is meant ‘a set of things working together as parts of an interconnecting network; a complex whole’. The word ‘interconnecting’ is critical here. In simple terms, the whole is more than the sum of its parts: the same things, connected differently, will function differently: they are different ‘network topologies’. Understanding the nature and causes of system performance therefore requires an understanding of the whole, a ‘Gestalt’.

Given the similarities between the two – each is an *IAS* – the central theme of this Essay is that learnings from advances in brain science can be a fruitful source of comparisons, analogies and metaphors in seeking to better understand the governmental *IAS*, i.e. to achieve a better Gestalt of the relevant system. Further, this could provide a base for the development of more productive and progressive (in the sense of knowledge accumulation) policy making.

There is a twist in the story though. Many of the new learnings that come from such an exercise turn out be old learnings from a period about a quarter of a millennium or more ago. They are re-learnings of what the late Professor Gavin Kennedy referred to as a ‘lost legacy’. An implicit, ending message is therefore: ‘Stop forgetting: make better use of that legacy’. It is high value, collective human capital that has been, and continues to be, grossly under-utilised.

To motivate the exercise, we start with a striking illustration of the effects of brain structure on perception, drawn from the work of Dr Iain McGilchrist, on which we chiefly rely for insights that can be provided by brain science. The picture shown below comes from his clinical material on patients who have suffered damage in one or other of the right or left hemispheres of the brain. Given a target stimulus – drawings composed of the numeral 2 or of small circles – the patients are then asked to draw what they have ‘seen’. When the damage is to the right brain hemisphere (RH), but the left hemisphere (LH) is intact, the exemplar result shows that the components (the numerals and the circles) have been ‘seen’ (by which we mean envisioned or brought to presence in the mind), but their pattern has not been ‘seen’. When the damage is to the LH, but the RH is intact, what is re-produced is the pattern of the arrangement of the component things, not the things themselves (the numerals and circles): the latter are not reproduced. Instead, what are drawn are connecting lines that are not present in the target stimulus: what is envisioned/imagined is a network topology, not a magpie’s nest of observable things. The RH ‘sees’ the pattern (the topology of things), but not the component things themselves; the LH ‘sees’ the things, but not the pattern (topology).

Target stimulus	LH intact	RH intact
		
		

Source: The Matter With Things.

Speaking in broad terms, what is ‘seen’ (envisioned in the mind) and what is ‘not seen’ is itself a function of the structure/topology of the IAS that is the human brain, and more specifically of the brain’s ‘division of labour’. The mere existence of such a functional relationship might perhaps be regarded as a trivial proposition in and of itself, but the interesting point is that more specific aspects of the relationship, in particular the effects of LH/RH brain asymmetries, can

be inferred empirically. Strokes disrupt/perturb/alter the functioning of neural networks. Things are damaged and interconnections between things are lost. Systematic consequences of those changes (in network topology) for what is ‘seen’ and what is ‘not seen’ can be observed and assessed. There is an immediate resonance from the illustrative picture with Pascal’s comment on the twofold nature of man, itself an observation that has found support from notable philosophers such as Spinoza, Kant, Nietzsche and Bergson, to name but some. The LH and RH of the human brain seemingly attend to sensory inputs in very different ways. To quote McGilchrist: *“there is a world of difference between the two hemispheres: literally, since they give rise to two different experiential worlds.”*

We recommend that readers keep this picture firmly present in the mind throughout the arguments to come.

2. The two sides of the human brain

In his most recent book, *The Matter with Things* (“*TMWT*”), McGilchrist starts with a detailed, nuanced examination of the basic structure of the mammalian brain, looked at it from various angles (top-bottom, front-back, and left-right axes). We concentrate on the third, because it is the most foundational for our purpose. What follows is inevitably very abbreviated, but *TMWT* provides abundant further information for those who want to delve deeper.

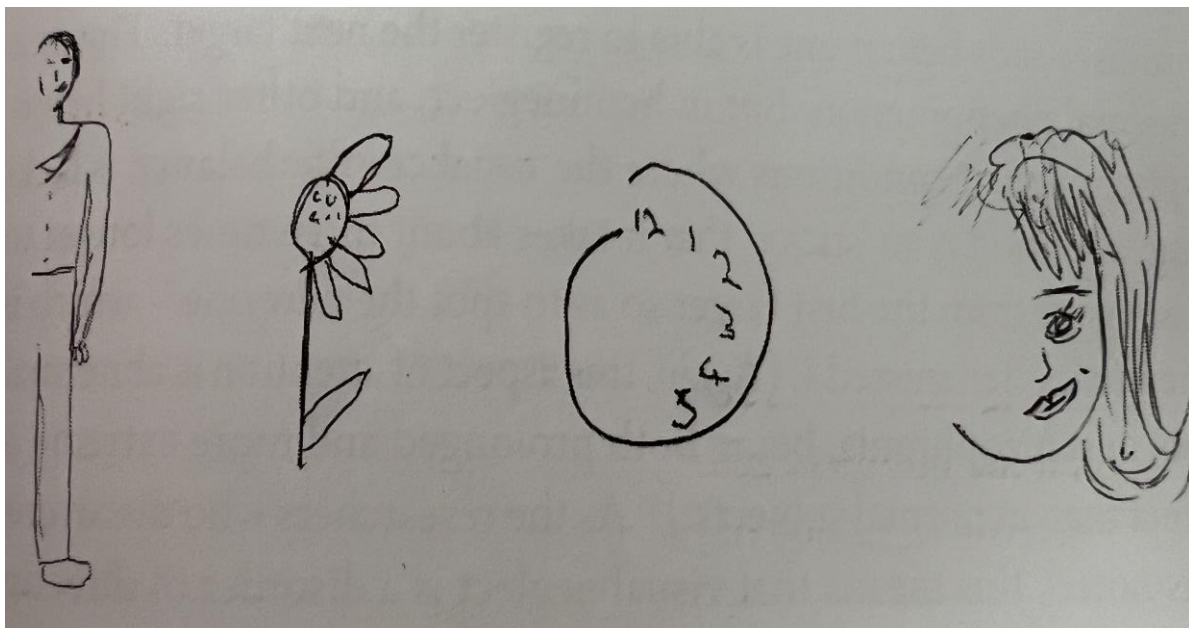
The human brain has a profoundly asymmetric structure on the right-left axis, with a significant gulf between hemispheres, which are of different sizes, shapes, and weights. The hemispheres also differ in terms of their sensitivity to various neural transmitters and other aspects of neural architecture and organisation. Each ‘half’ can sustain consciousness alone, which can be established directly, as for example in lesion studies after an individual has a LH or RH stroke, or indirectly through temporary hemisphere suppression using transcranial magnetic stimulation techniques.

There is a crucial division of labour within the overall operating system. It is not that different ‘halves’ of the brain ‘do different things’ (reason, emotion etc.), rather each does more-or-less everything. Crucially, however, they attend to (etymological Latin root ‘reach out to’) the world in different ways. And, as McGilchrist argues: *“Attention changes the world. How you attend to it changes what it is you find there. What you find then governs the kind of attention you will think it appropriate to pay in the future. And so it is that the world you recognise (which will not be exactly the same as my world) is ‘firmed up’ – and brought into being”.*

The RH (controlling the left hand - a complication of neurology is that sensory and motor aspects in the body normally switch sides) attends to the world with the sustained vigilance of, say, a radar system, sensitive to breadth and depth, detecting/seeing not only things that are ‘out there’ but also their movements, their patterns, and anomalies in their patterns. However, this is not just passive surveillance. *“It [the RH] is constantly engaged in both sustaining coherence in the world and actively scanning the world”* (McGilchrist). Thus, as it encounters the world with its broad sweep, the RH comprehends the implicit, making immediate

inductions from constantly changing new sense perceptions, an analogical form of reasoning grounded in experience. A practical implication is that it is devoted to vigilance and exploration, on the lookout for both danger and opportunity. In short, the RH is concerned with the whole and how to relate to it – it works with a Gestalt.

The LH (controlling the right hand and right visual field) apprehends the world with a narrower, local focus, an analytical, partial, and disembodied attention that abstracts from and is relatively insensitive to movement, attending to aspects of a foreground rather than a fuller context. It reduces the world of interest to one that it can grasp and ‘re-present’ in its own terms, breaking down ‘the whole’ into parts for analysis. Its focus is on the internal coherence of the information that it itself processes, not what is experienced more generally. With its restricted focus comes the negation of anything lying outside its immediate attention, as illustrated in the picture below, again taken from McGilchrist’s clinical material, showing drawings of a patient suffering from what is called hemineglect (reduced awareness of stimuli on one side of space, even though there may be no sensory loss). In *TMWT*, he produces a wealth of evidence from neurological studies to support his contention that: “*What it doesn’t attend to, as far as the left hemisphere is concerned does not exist*”. It is not ‘seen’.



Source: *The Matter With Things*.

Overall, McGilchrist summarizes the different ways the RH and LH attend to the world as follows: “*One way of putting it is that the left hemisphere can provide some sorts of knowledge about the world, as it would be scrutinized from a certain theoretical point of view, effectively outside the realms of space and time (as on a map), whereas the right hemisphere provides us with the knowledge of the world in space and time (as experienced)*”. Or, more bluntly, “*The right hemisphere gets the form, the shape, the whole; the left hemisphere gets the bits and pieces*”.

We note in passing at this point that brain lateralisation (hemispheric specialisation) is to be found in animals other than placental mammals, though the corpus callosum is a feature of only

the latter. Here, to illustrate the generality of this topological feature (lateralisation) of animal brains, is a condensed abstract from a scientific paper on bird brains:

*“The hemispheres of the avian brain are specialized to carry out different functions. Since each eye sends its input mainly to the contralateral hemisphere, birds respond differently to stimuli seen with the left eye than they do to stimuli seen with the right eye. The right hemisphere attends to novel stimuli, which easily distract it from ongoing functions. It assumes control in emergency or stressful conditions. The left hemisphere attends to learnt categories and controls behavior in routine, non-stressful situations. ... Knowledge of these specializations is relevant to understanding the behavior of birds in the wild since birds respond in different ways to stimuli on their left and right sides and they choose to view different stimuli with the left or right eye. Individual differences in the strength of visual lateralization are determined by exposure of the embryo to light, versus incubation in the dark, and by the levels of steroid hormones in ovo. The importance of these influences on lateralization is discussed in terms of behavior in the natural habitat. The potential importance of hemispheric dominance in the welfare of birds is also considered.”*¹

A further curious thing about the architecture of the brain’s ‘hardware’ is relevant to note. We need both types of attention to survive and thrive as humans. It is not an either-or choice, and co-ordination between the two ‘halves’ is key. The corpus callosum, an evolutionary development of placental mammals, acts as a sort of information super-highway, the most important and immediate way in which the two hemispheres of the brain interact, the mediator both of connection and of hemispheric specialisation.

Perhaps surprisingly, at least at first glance, that highway has roadblocks and significant inhibitory capability. In humans, only two percent of neurones in either hemisphere have fibres that cross the corpus callosum in the first place, already ensuring a high degree of functional independence. Interestingly, the RH communicates more, and more quickly, to the LH than vice versa. While the majority of fibres that do cross are facilitatory (employing the excitatory glutamate), many of these connect with inter-neurones that employ an inhibitory acid (gamma-aminobutyric acid). Indeed, the renowned Spanish neuropathologist, Santiago Ramon y Cajal, believed that the amazing evolution in power of the human mind was primarily a result of the number and diversity of inhibitory inter-neurones.

Overall then, evolution seems to have guided the two sides of the brain to operate without too much distraction of one by the other. The point (and it is a big point for our purposes) is that, given specialisation and differentiation, the callosal tracts need to ensure an effective degree of co-ordination, and they have evolved toward doing so in minimally interfering ways.

McGilchrist puts it this way in his review of the long evolution of the brain as increases in the amount of information to be processed go alongside the deepening complexity of social

¹ Rogers, Lesley J., ‘The two hemispheres of the avian brain: their differing roles in perceptual processing and the expression of behavior’, *Journal of Ornithology*, Volume 153, 61–74 (2012).

interactions: *“One of the ways the need for interconnexion could be spared would be by specialisation of cortical areas. That way, only ‘results’ of (what would increasingly become) more local processing would have to be transmitted. In other words, functions could be delegated, and only what needed to be known outside of the area of delegation would be shared. Large administrative organisations are sometimes criticized, no doubt justly, because ‘the left hand does not know what the right hand is doing’, but a degree of mutual ignorance is indispensable, provided the important outcomes are communicated.”*

A final, critical aspect of McGilchrist’s work is his judgement concerning the primacy of the RH, a fundamental asymmetry in the relationship between the two hemispheres. For a start, representation (a LH brain function) by definition depends on earlier envisioning/‘presencing’ (a function of the RH). Broader attention naturally precedes more detailed scrutiny: not everything can be scrutinised in detail and the most productive foci of LH attention have to be identified from a wider apprehension of things. What the LH has to offer is an intermediate process in thought, analysing what has been passed to it for more detailed examination by the RH. That done, the results need to be reintegrated into the ‘whole’, reported back to the RH, in order to enable an enriched vision of the world, an updated Gestalt.

That, at least, is how well-functioning hemispheres should work together. In *TMWT*, McGilchrist examines what happens when, for whatever reason, they do not work in that way, detailing some of the quite startling and extraordinary ways in which RH and LH deficits can affect an individual’s ‘take’ on the world. The opening picture of this Essay is one example of that. The short story is that a RH stroke is in most cases significantly more detrimental for a patient’s future hold on reality and ability to sustain a coherent world view in space, time, motion and emotion, than an LH stroke. Beyond such medical lesions, there is a much broader theme of the problems arising in the absence of proper re-integration of RH/LH thinking, even when both hemispheres remain fully functional, and of the imbalances in thoughts that can result. The greatest risk identified in *TMWT* is of a reversal of the asymmetry; the emergence and persistence of LH dominance. Such an imbalance has potentially very serious consequences because, as McGilchrist puts it: *“It’s [the LH] a good servant, but a very poor master”*.

For our own purposes, the notions of ‘reversal of asymmetry’ and ‘master and servant’ are a little too binary. The way we would put it is that the LH and the RH attend to different things (a division of labour) and it is desirable that they do those things harmoniously, in a balanced, co-ordinated way. LH dominance occurs when the harmony breaks down and the LH achieves an unduly high, inadequately inhibited influence on decisions/actions. This ‘softened’ view opens up the kinds of discussions to be found in the social sciences concerning the implications of different degrees of influence/dominance/power .

The ‘good servant, but a very poor master’ judgement is a very general one, but, as we will next argue, it does seem to be consistent with an observable pattern in the development of thinking in the discipline originally called political economy (a discipline directed at understanding public policy choices and their effects) over the past quarter of a millennium.

3. The Invisible Hand

Adam Smith's *Wealth of Nations* ("WoN") exudes a breadth and depth of knowledge that caused Alfred Marshall to describe it over a century later as "*the greatest step that economics has ever taken.*" But there is much more to Smith's thinking than economics, which alone is incapable of crafting a whole-system Gestalt, the challenge he took on in developing his vision of a *System of Natural Liberty*, building on the thinking of, and using the same terminology as, one of his mentors at Glasgow University, Francis Hutcheson.

Before the *WoN* were Smith's *History of Astronomy* (one of his *Essays on Philosophical Subjects*) and his *Theory of Moral Sentiments*. The first of these set out a philosophy of science and was only published posthumously, its arguments having been considered highly controversial in the Scotland of the mid-18th century. In it is Smith's first reference to an Invisible Hand (he used the phrase only three times through his full life's work), a metaphor likely taken from Shakespeare's *MacBeth* (where the relevant hand was "bloody" as well as invisible). *MacBeth* is a work with which he will have been well familiar: he lectured on Rhetoric and Belles Lettres at Glasgow, which encompassed tragedy, and his lectures included critical examination of parts of Shakespeare's works. In *History of Astronomy* the relevant hand belonged to the God Jupiter.

Nowadays, the metaphor is generally misunderstood as referring to the self-balancing or coordinating properties of competitive markets, but a glance at the differences between the three, recorded usages indicates that, from the *History of Astronomy* to the *WoN*, Smith was consistent in using the expression as a metaphor for 'unseen' connections between actions or events and their effects. We can, literally, observe the transactions between customers and a butcher or a baker, and maybe their immediate effects – a good meal, more cash in the till – but not all their consequences for later events that the transactions might influence.

In this use of language (the Invisible Hand), Smith was using a vivid metaphor to communicate, to a wider audience, his youthful thinking on the philosophy of science, as set out in *History of Astronomy*. He saw the mission of science – or natural philosophy as it was then called – as being the discovery of connecting principles or connecting chains that could help create order out of an otherwise perceived chaos of "*events which appear solitary and incoherent with all that go before them, which therefore disturb the easy movement of the imagination*".

This sentiment has immediate resonance with our initial citation from Iain McGilchrist's much later work on the structure of the human brain and its implication for human understanding of the world: "*The experience of understanding involves a shift from what seems initially chaotic or formless, to a coherent stable form or picture, a Gestalt.*"

Smith is clear throughout that these principles/chains are creations of the human mind: "*Philosophy, by representing the invisible chains which bind together all these disjointed objects, endeavors to introduce order into this chaos of jarring and discordant appearances,*

to ally this tumult of the imagination". The chains are *invisible* in the sense that we cannot observe them directly (no-one has observed a gravitational force or field), but they can be envisioned ('seen' in the mind) and it is the task of the philosopher/scientist to do exactly that, in a systematic way.

Given this, it can be noted again how the RH of the brain 'connects' the dots in the opening picture – the drawn lines are not present in the target stimulus, and the gaps between the numerals and the circles can be likened to the synapses of the brain. A synapse is a place where pieces of neuronal tissue almost, but don't quite, meet. It is a gap, an empty space, so it can't be seen in the everyday sense of that word. Yet it is a void that plays a critical role in brain functioning, because of its defining characteristic: it is a space across which neurotransmitters can pass, allowing connection between the two sides of the gap. Current estimates of the number of synapses in the human brain put it at the order of 100 trillion. Together with neurons (estimated to number around 80 billion) the locations and geometries of synapses define what can be called the brain's 'network topology'. And to understand the functioning of the brain, it is necessary to understand the topology as a whole: inclusive of both the things connected and the particular structure of the connections (which themselves vary dynamically over time thanks to the characteristics of the synapses which, in differing, specific contexts, determine different transmission routes). Thus, going back to the initial picture, it is as if the RH is saying 'it's the connecting highways that matter, never mind the gaps.'

Smith's later references to an Invisible Hand, one each in the *Theory of Moral Sentiments* and the *WoN*, simply provide a metaphor for two (rather different) connecting chains that were 'unseen' in the minds of those whose actions triggered them, but could potentially be 'seen' by a philosopher/scientist as posits in the development of a Gestalt. He did wobble on this point somewhat when it came to Newton's gravitational 'force', drifting toward thinking of it as more than just a posit (such was the awe commanded by Newton at that time) and it was quite a while before Einstein's work so clearly indicated that the gravitational 'force' was a product of a brilliant mind, a 'connecting principle' or posit, and no more than that. Interestingly, a millennium earlier Bede arguably took a similar position to the undiluted Smith when, in discussing the "harmony of the moon and the sea", he wrote that it was "as if" tidal movements were caused by "exhalations" of the moon.

4. The narrowing of vision in the evolution of economic thought

The seen/unseen distinction survived as a major theme through to the end of the classical period of political economy, usually dated at around mid-19th century. In a famous essay – *What is Seen and What is not Seen* (1850) – Frederic Bastiat wrote: "*There is only one difference between a bad economist and a good one: the bad economist confines himself to the visible effect; the good economist takes into account both the effect that can be seen and those effects that must be foreseen.*"

By and large, however, political economists' fields of vision started to narrow over the course of the 19th century, with Ricardo's *Principles of Political Economy* (1817) often considered the first major milestone in the directional shift.

Joseph Schumpeter, in his posthumous *History of Economic Analysis*, disparagingly said this of Ricardo's approach: "*The comprehensive vision of the universal interdependence of all the elements of the economic system that haunted Thünen [a German economist of the early 19th century] never cost Ricardo more than an hour's sleep. His interest was in the clear-cut result of direct, practical significance. In order to get this he cut that general system to pieces, bundled up as large parts as possible, and put them in cold storage – so that as many things as possible should be frozen and 'given'. He then piled one simplifying assumption upon another until, having really settled everything by these assumptions, he was left with only a few aggregative variables, between which, given these assumptions, he set up simple one-way relations so that, in the end, the desired results emerged almost as tautologies. ... The habit of applying results of this character to the solution of practical problems we shall call the Ricardian Vice.*"

On this view, Thünen's, like Smith's, attention was governed by an envisioning of a whole system (a RH functionality), whereas Ricardo's attention was focused on "*the clear-cut result of direct, practical significance*", reflecting the narrower, grasping interest of the LH.

Though increasingly practised, the Ricardian Vice did not enjoy unchallenged supremacy as economic thought continued to evolve in the later 19th century and through the 20th century. Alfred Marshall (Keynes's mentor) and Keynes himself both pushed back against it, although Marshall's *Principles of Economics* contained a good deal of it and he later had some regrets about that. In later life he wrote of the role of mathematics in economics as follows: "*But I know I had a growing feeling in the later years of my work at the subject that a good mathematical theorem dealing with economic hypotheses was very unlikely to be good economics: and I went more and more on the rules – (1) Use mathematics as a short-hand language, rather than as an engine of inquiry. (2) Keep to them till you have done. (3) Translate into English. (4) Then illustrate by examples that are important in real life. (5) Burn the mathematics. (6) If you can't succeed in 4, burn 3. This last I did often.*"

In a similar vein, Keynes's *General Theory* opens with a critique of classical economics, by which he meant how the discipline had developed post Smith. Following that opening, the book turns to more technical material with its nods and bows to the dominant technology of economic analysis – albeit always suffused with a general sense of the radical uncertainties surrounding the relevant matters – and only later to a break-out into much wider visions of the economic landscape. Given this structure, it was the more technical sections that, almost instantly, drew the attention of other economists. In no time flat, Sir John Hicks reduced it to a simple, diagrammatic model (the IS/LM characterisation of the technical material) in the manner of Ricardo, and elaborations of that model have dominated in macro-economic teaching since then, i.e. for around 90 years.

And so, we are where we are in the practice of policy economics. Assumption is piled on assumption. Each assumption draws a veil over a potentially relevant part of a wider economic context, which thus becomes ‘unseen’ to the analyst. These veils are not to be rent, potentially relevant information they conceal from vision is not to be brought into the presence of an interrogating judge. The best that is usually done is sensitivity analysis, re-running a model with varying mixes of assumptions, but this reduces things to ‘what if’ exercises, the ifs being the various combinations of assumptions. The general finding is, since the number of potential combinations can be vast, a whole host of (often widely) different results can be implied. That, of course, is a generally correct, deductive conclusion when working with abstractions across a narrow front, but it is not one likely to be attractive to customers for analytic work, very many of whom are likely to be Ricardians, with interests in grasping “*the clear-cut result of direct, practical significance*”.

The Ricardian Vice continues to be widely practised among economists to the present day, and its seemingly growing costs are only too evident. When Her Majesty Queen Elizabeth visited LSE and asked of the 2008 financial collapse, “*Did nobody see it coming?*”, a responsive letter from a group of Fellows of the British Academy confessed, inter alia, to ‘narrow vision’: “*Risk calculations were most often confined to slices of financial activity, using some of the best mathematical minds in our country and abroad. But they frequently lost sight of the bigger picture.*”

Put another way, the LHs of specialist experts – focused on “*slices of financial activity*” – were effective enough, but RH expertise in envisioning the connections between the slices was absent, or at least heavily discounted. One of Keynes’s criteria for good economic policy analysis, that the ‘particular must be contemplated in terms of the general’ (see the opening *Pensées*), was not satisfied.

Ultimately, these deficiencies of economic analysis are, in and of themselves, not a fatal flaw. Gross simplification can produce insights and (rebuttable) rules of thumb, witness the supply-demand diagram which all economics students are taught. If taught as learning heuristics that may be of use when considering economic policy issues, there would be little to object to, provided that it is made clear that they should never be relied upon in policy matters without considering them in the context of an informationally much richer, wider picture. The substantive harms come when results of relatively narrowly focused analysis are unduly influential in determining decisions/actions, i.e. there is LH dominance, because the influence of the RH is turned down or blocked. In that case there will be a direct, unmediated route from the narrowed analytics of the LH to conclusions about policies that will, in practice, be perturbations of a whole economic system, and should properly be seen as such.

5. Towards a better gestalt: the co-ordination challenge

It is one thing to diagnose a problem such as a narrow or fragmented vision: Schumpeter did it in his *History of Economic Analysis*, as did the Fellows of the British Academy in their

responsive letter to the Queen. The Fellows also promised to try to do better in the future, but there has been little sign of significant progress in the time since.

What then can be done about narrowness of vision problems in government and the emergence of economic policies that have been quite devastating in some of their effects, not only in relation to the global financial crisis of 2008, but also across a very wide range of areas of public concern? At the most recent Regulatory Policy Institute Conferences in Oxford and Westminster, we argued that an obvious starting point for re-appraisal would be to consider the way Adam Smith himself developed his policy thinking. While he was principally motivated by a particular economic challenge (the dysfunctions of the British mercantile system of his time), he started with a broad vision, developing an evolutionary (process) Gestalt, and only honing in on a critique of Mercantilist policies much later on.

More generally, our (longstanding) appeal has been to go back to a platform of ideas in political economy developed in the Scottish Enlightenment period, before the subsequent narrowing of minds, and to think again in ways that build from that first base so as to restore a much more holistic representation of the relevant economic context, both as a starting point and an ending point for policy decisions.

Smith's starting point in developing his Gestalt was exemplary. He observed that productivity growth appeared to be strongly related to progress in the division of labour, i.e. to increasing specialisation in the performance of tasks. A pin factory, a picture of which was subsequently introduced on the reverse side of Bank of England £20 notes, was his lead example. That quickly led on to the question of how it was, with specialisation in production, that disparate economic activities could be co-ordinated in a way that ensured that all could obtain the 'necessities and conveniences' of life, since people cannot live by pins alone.

The answer was 'exchange transactions'. Exchange *connected* one person (a buyer) to another (a seller). Moreover, institutions for facilitating such exchanges (such as 'markets' and 'money') had evolved over time to turn them into routine activities. These connections were established more or less everywhere in the economy, the determining criterion for what the Scottish literati called a 'commercial society', resting on a connecting principle of reciprocity, or *quid pro quo*.

Smith also 'saw' a major, reinforcing feedback loop for productivity: the development of a division of labour leads to the development of institutions to facilitate exchange transactions, which themselves serve to expand the volume of trade, which makes possible a deeper division of labour (greater specialisation), which in turn promotes both higher productivity and further institutional development.

But he also 'saw' that, when the field of vision was expanded beyond that required to answer the basic co-ordination question, other implications of the specialisation entailed by a deep division of labour could, if left unchecked, be highly negative. He wrote: "*But the understandings of the greater part of men are necessarily formed by their ordinary employments. The man whose whole life is spent in performing a few simple operations, of which the effects, too, are perhaps always the same, or very nearly the same, has no occasion*

to exert his understanding, or to exercise his invention, in finding out expedients for removing difficulties which never occur. He naturally loses, therefore, the habit of such exertion, and generally becomes as stupid and ignorant as it is possible for a human creature to become.”

And that, in a sense, can be described as a ‘liberal theory of alienation’, very different from the kinds of Marxist thinking that came later. The separation that gives rise to problems is an estrangement from an individual’s own RH functionalities, i.e. from part of the individual’s own human capital. An immediate implication is that part of the economic value of her/his endowed human capital is diminished. When Apollo’s curse – which, being a Greek god, he could cast in an uninhibited, unconstrained manner to achieve “a clear-cut result of direct, practical significance” – Cassandra’s potential audience was alienated from her insights/foresight. Although modern commentaries on the myth have tended to focus on Cassandra’s anguish, we draw attention to the much wider scope of the harm: all mortals suffered in consequence.

While Smith’s final judgment on stupidity and ignorance is exaggerated (it was a characteristic of his rhetorical style that he didn’t hold back in expressing what he had concluded was an important point), another highly significant causal chain is identified: heavy specialisation in a particular, highly limited and routine sub-set of human activities affects the functioning of the human brain in ways that can shrink its capacities for thinking about matters that go beyond the highly regular and highly familiar. A large part of that may be that the brain simply does not even ‘see’ salient features of any wider or different context, rather like the RH stroke sufferers discussed in the introduction.

An appreciation of the massively extensive web of connections that exists within the economic system, not just a limited slice of it – something that it would appear desirable for anyone involved in economic policy making to possess – leads naturally to the thought that the structures and functioning of the human brain might provide useful metaphors and analogies to help in reflecting on the workings of government. A quarter of millennium after Smith, we have much richer information and knowledge on these structures and processes than he had in his own time, and should therefore be able to do better.

As outlined earlier, there is a division of labour in the human brain, just as there is in the economy and in the governmental sub-system (‘Leviathan’). In the case of the brain, it can be said to have evolved *naturally*, not according to any planned design. The same is true for the economic division of labour that Smith observed and analysed, albeit over a shorter time period. In each case, the evolved system processes and acts upon vast flows of information in ways that, to be effective, require substantial co-ordination.

In contrast to the natural processes of the wider economic system and to the evolution of the brain, co-ordination of activities has been a recurring problem in government which seems much more resistant to development and improvement, as John Adams recognised in the cited *Pensée*. It appears to be a case of *plus ça change* (and the scope of governmental activity has certainly expanded very considerably since Smith’s time), *plus c’est la même chose*.

A lack of co-ordination between activities falling within Leviathan's domain was a theme of New Labour governments in the decade before the financial crisis, with Prime Minister Tony Blair keen on promoting 'joined-up government'. Vernon Bogdanor published a book with that title in 2005, referring to it in the blurb as an important and exciting development in modern government. Alas, as we now know, that assessment turned out to be overly-optimistic and 'joined-up government' (not necessarily a bad metaphor) has, to a first approximation, been just another sound bite, another exercise in overly simplistic, Ricardian thinking.

Moreover, government challenges go beyond coordination of activities. Unlike the human brain that flourishes with imagination and new ideas, government struggles to innovate and adapt. As a general matter and notwithstanding its command over great resources, Leviathan does not tend to see policy opportunities at all well, at least in a timely way. Barbara Tuchman's book *The March of Folly* opens with the line: "*A phenomenon noticeable throughout history regardless of place or period is the pursuit by governments of policies contrary to their own interests.*" Later, using a brain metaphor, she writes that: "*Wooden-headedness, the source of self-deception, is a factor that plays a remarkably large role in government.*" While we are not convinced of the relationship to self-deception, wooden-headedness does appear to be a reasonable descriptive term for the current state of many policy systems. Our view, though, is that 'half-brained' would be a much better description of the relevant phenomenon.

Yet it would be wrong to say that Leviathan's servants are dominated by individuals who are atypically wooden-headed or narrow minded at their first entry into service. If they become so (perhaps as a result of over-specialisation associated with the division of labour, as per Smith's view), or, more saliently for current purposes, if the collective results of their endeavours can be so characterised, there must be a reasonable suspicion that the problems lie in systems failures, in the organisation of the division of labour and in the connectivities and interactions among public servants.

What we are talking about, then, is the collective working of an organised (by design) set of minds within government, specifically those employed in the conduct of economic policy, particularly in relation to the system's capacities to co-ordinate activities, innovate, and adapt to changes in circumstances. The individuals concerned are part of a system, or structure, or (most insightfully in our view) a 'network topology' that can loosely, be referred to as 'Leviathan's brain'.

Our question is: can study of the topology of the human brain itself usefully inform attempts to develop more effective topologies for Leviathan's (much cruder, much simpler) brain structure? We think it likely can, and that an obvious base camp for thinking on the matter is Iain McGilchrist's thesis concerning the differences in attending to sensory inputs between the RH and the LH of the human brain – a structure evolved to receive, process, analyse and synthesise information with a view to arriving at contextually appropriate behaviours/conduct.

6. The ‘half-brained’ nature of Leviathan

The first observation to make about the structure of Leviathan’s brain – a network topology comprising a large set of human minds and the structured connections between those minds – is that, to at least a good first approximation, there is no identifiable, organised division of labour between LH and RH functionalities across the system as a whole. Further, whereas LH activity is ubiquitous, there is no identifiable RH sub-system; the nearest approximation to one perhaps being in the military and security services domain, where, for example, an institution such as GCHQ engages in wide horizon scanning and where senior officers meaningfully engage in the formulation of strategy.

Since there are no distinct LH/RH sub-systems to connect, in this *IAS* there is no analogue of the corpus callosum in the human brain, the main nerve tissue that connects the two hemispheres and regulates the information flows between them. Apparently, socio-political evolution has not reached this stage of development yet. In the absence of an identifiable RH sub-system, it is not big a stretch of language to say that Leviathan is ‘half-brained’.

What we observe is a singular structure that, in its individual parts, is overwhelmingly dedicated to the kinds of grasping and controlling activities which in the human brain are largely governed by the LH. In Schumpeter’s characterisation of Ricardo’s thinking, the chief interest lies in finding a quick route to “*the clear-cut result of practical significance*”, with the added desiderata that the result be both immediate and visible.

In conducting these grasping/controlling activities, the various parts of the government system are unguided by the results of any sustained, continuing attention/vigilance paid to the constantly changing, wider economic environment, i.e. the type of attention associated chiefly with the RH of the human brain. Consequentially, co-ordination between Leviathan’s activities is poor and, to resort to another medical science metaphor, the beast could be said to suffer from organisational *ataxia* (a term for a group of disorders that affect co-ordination, balance and speech, outcomes that have been linked to impairments to the corpus callosum).

In the case of the human brain, co-ordination is the result of a long process of evolution via which less effective co-ordinating structures have been ‘selected out’. A similar process is at work in relation to socio-economic institutions, generally on much faster time scales, and it was Smith’s great achievement to explain how it was done on the economic front. Leviathan, however, has evolved no analogous institutional arrangements to co-ordinate its own parts, and that perhaps should not be surprising. It is, after all, a monopoly. More than that, it is a monopoly in an activity that is still generally viewed as indispensable: the legitimate use of physical coercion. It’s personnel may vary, but the monopoly endures. Selection-for-fitness mechanisms for the system as a whole are weak.

Examples of the effects of developmental stasis abound. In the regulatory area, what is to be observed is a good deal of regulatory clutter and regulatory interference (the regulations overseen by one department acting to thwart the effectiveness of the regulations overseen by another), even to a point where the effects can, considered jointly, be self-cancelling or negative in terms of their implications for the achievement of policy aims. As per Smith, overall

productivity is low for want of co-ordination and, given the nature of the activities concerned, that itself serves as a future drag on productivity growth (poorly allocated human capital is negative for subsequent growth in human capital).

Of his time in government employment during WW2, Nobel Laureate Professor Ronald Coase said this: *“This war-time experience did not significantly influence my [political] views but I could not help noticing that, with the country in mortal danger and despite the leadership of Winston Churchill, government departments often seemed more concerned to defend their own interests than those of the country.”* This is how it is when there is no guiding hand to help individual organisational units in a system align their activities in ways that better contribute to the overall performance of the system.

7. Improving coordination in Leviathan’s brain

Leviathan has, to date, always been half-brained, but it is not inevitable that it will always have to remain so. The network topology of governance is something that can be changed ‘by design’, and by that we do not mean to suggest that the aim should be to sit down and try to construct an entirely new topology. Rather, recognising that government is a complex evolving sub-system, what we have in mind is closer to some relatively limited ‘genetic engineering’ with the aim of perturbing the system to a different path of development, to a path that can move forward from a long sustained stasis. In complex, dynamical systems – and the economy is certainly one such – even small perturbations can have very large effects, because they can tip or tilt the evolution of the system on to different, developmental pathways (just as small genetic changes can do in the plant and animal worlds).

The big challenge – easy to state, but difficult to meet in practice – is to ‘see’ where the key points of leverage are in seeking to achieve this sort of development. It is a core, early task in strategic analysis. Where precisely would a policy perturbation be likely to have the largest beneficial effects? What are the threats that it is most important to address? Where lie the opportunities that might be seized? What are the most important blockages to progress that it would be advantageous to remove?

For highly interconnected, dynamical systems, it first requires a good Gestalt, a good understanding of how the whole system functions. In this, the connections between different elements are a crucial determinant of how the system performs: as previously stated, the same things connected in different ways will lead to different outcomes. RH functionality in reaching out and attending to the workings and connecting principles of the whole system is therefore an indispensable aspect of good policy strategy.

Once candidate points of leverage are ‘seen’, the LH comes more into its own, in its capacity as an analyst of more specific, narrower things, though always holding fast to the principal that the analyst *“must contemplate the particular in terms of the general”*, i.e. to a RH overview.

Good strategy performs a co-ordinating function within organisations. It serves, to at least some extent, to bind together the divided activities within the relevant organisation and give them some overall coherence. It should be a *sine qua non* for economic governance, but experience teaches that it is relatively fragile. An exceptional Prime Minister might, with considerable effort (in the UK Prime Minister Blair made reference to the “scars on my back” resulting from his attempts at significant reforms), have limited success, but their retirement tends to lead to relapse into the ways of a system characterised by LH dominance. There is a ‘systems problem’ to be addressed: an absence (or near complete sub-ordination of) component sub-structures of government that are focused on attending to the functions served by the RH of the human brain.

8. Obstacles to improvement

Whilst any general strategic analysis of economic policy in Britain and like nations is well beyond the scope of this Essay, it is possible to identify a small number of major obstacles to improvements in governance which are embedded in the current systems. Such an exercise not only aids better understanding of the stubbornness of the stasis, but also gives immediate pointers to strategic objectives that could be adopted quickly, if the will to do so could be summoned.

8.1 Incumbent LH dominance

Promoting RH functionality in government requires an original promoter or small group of promoters who recognise the significance of the exercise, and likely they can only come from within the existing system of governance itself. And there’s the rub, since the existing system is dominated by LH concerns and is monopolistic in nature. Why would a LH system, by its nature trained to ‘see’ things on a narrow basis, be able to grasp the idea that a wider Gestalt would be beneficial? Why, in the absence of existential threats, should participants in such a system take a serious interest in an exercise to develop a better Gestalt, a cognitively effortful exercise that could distract from attending to ongoing, everyday functions? It is much easier to ignore the idea, or cancel any thought of it, i.e. not to ‘see’ it.

The LH dominance is particularly acute at the top of the political food chain. The chief prizes to be won result from the grasping/grabbing of power/control and from the exercise and retention of any power/control that is grasped/grabbed. Options for actions that distract from the contests for these things are not ‘seen’: they are of little or no interest to the LHs of the individuals concerned.

The structure of political competition is also characterised by an adverse selection mechanism: it is biased toward promotion through the ranks of those who are most adept at grasping/grabbing power and control, not for their fitness for governance. In Friedrich Hayek’s major work for a general audience, *The Road to Serfdom*, there is a chapter titled ‘Why Bad Men Rise to the Top’ which addresses the issue. That was published (in 1944) at a time when, across the seas, some seriously bad men could be observed at the top, but in less stressful times

broadly similar arguments could have been deployed under the heading ‘Why people with strongly dominant LHs rise to the top.’

In this context, there is a temptation to take some encouragement from brain science. As cited above for avian brains, “*The right hemisphere attends to novel stimuli, which easily distract it from ongoing functions. It assumes control in emergency or stressful conditions.*” On this basis, a sufficiently serious crisis might trigger a search for a better Gestalt. Unfortunately, however, the thought is of limited consolation. The Avian brain is characterised by lateralisation (structural specialisation in matters to be attended to), whereas Leviathan’s brain isn’t. RH functionality is simply not available at all, other than from random individuals scattered around in a LH sea, unable to provide it in any sort of concentrated and developed form. Leviathan is not ‘bird-brained’, but ‘half-brained’.

Thus, when the stresses and emergencies come along, the response tends to be to tilt further to LH dominance in cognition, with the result that the performance of the LH itself deteriorates. This results from the combined effects of distractions from the ongoing, routine operations in which the LH specialises and, like Smith’s dumbed down labourer, its lack of expertise and its inexperience in ‘seeing’ and responding to unfamiliar issues. The deterioration in the performance of the health service in Britain following the arrival of the SARS-COV-2 virus is a vivid illustration of the tendency and its effects.

8.2 Bureaucratic mindsets and cultures

There is a large and important part of government activity that is captured by the word ‘routine’ (the Latin root *via rupta* is suggestive of a well-beaten path). Routines can be seen as a benign and important natural development of the division of labour in an institutional context, characterised by learning by doing. No less than Alfred North Whitehead described routine as “*the god of every social system; it is the seventh heaven of business, the essential component in the success of every factory, the ideal of every statesman*”.

Thus, the first of Max Weber’s characteristics of bureaucracy is ‘task specialisation’, whereby activities are divided into simple, routine categories on the basis of competencies and functional specialisations. For Weber, bureaucracy (which is the type of organisational structure within which the great majority of Leviathan’s servants work) is a *rational* way of doing things. Yet there are hidden perils in the unconsidered pursuit of well-beaten paths and the rationality claimed can, from a wider perspective, be ‘seen’ as the rationality of an inadequately guided or constrained LH, as a foolish form of rationality that is blind to the human environment beyond its immediately pressing, narrow tasks.

As Smith’s (highly significant) qualification to his points on the productivity benefits of a division of labour indicates, there are cognitive downsides to narrow specialisation. The LH gets routine, regular work-outs, whilst the RH is left on the sofa. In short and in terms of the brain metaphors we are working with, the activities of the RH and their effects on human conduct get turned down and, in the limit, get switched off entirely in consequence of a high degree of specialisation. Thus, whilst new recruits to a bureaucratic organisation may arrive bright-eyed and bushy tailed, with well-balanced brain hemispheres, the natures of the tasks

assigned to them and the organisational culture in which they operate can disturb the balance of the mind. The wider effect is to create self-replicating structures characterised by LH dominance.

At least to some extent, the point applies also when the narrow specialisms are of a less routine nature. Take, for example, the continuing debate about the merits of experts and generalists in the Civil Service. The latter have tended to receive a bad press in recent years and the most commonly found trope is that they are ‘jacks of all trades and masters of none’, i.e. are amateurish in all respects. However, irrespective of the actual performance of those in the Civil Service who might currently attract the label ‘generalist’, we think that this sort of discourse misses the big point and leads to a wholly misguided direction of travel, towards a system characterised by more and more fragmented LH expertise.

There is nothing amateurish about the operations of the RH of the human brain, which are directed at developing understandings of a whole system (continually updated in light of incoming information), not just parts of it. The tasks involved require expert and, in their own way, specialist skills, of types that are arguably the most difficult to acquire. Keynes reported that, in conversation, the physicist Max Planck had once said to him that he (Planck) had in youth contemplated studying economics, but that he gave up the idea, because he thought it was too difficult.

If, therefore, by generalist is meant someone who can ‘see’ and at least partially understand the functioning of a whole system, not just particular parts of it, our arguments imply a call for more of these people in government, not fewer, and, more than that, for them to be concentrated in a distinct, ‘lateralised’ sub-network of the wider topology of government.

8.3 Adverse self-selection

In the above two examples of obstacles or roadblocks to improvements in governance, the blockages are associated, respectively, with adverse selection in the process of political competition and with a temporal remoulding of mindsets from repeated exposure to bureaucratic, organisational cultures. To these can be added a third: prior self-selection on entry into the relevant contest or organisation. Put simply, potential candidates for entry whose mindsets are not LH dominated may conclude that ‘this is not for me’. This serves to reinforce an existing system and its cultures, which is by no means a negative thing in general. It is only when that which is being reinforced is a seriously under-performing system that the problems arise.

8.4 Interest group pressures

Governments exercise monopoly powers that have effects on the whole economy and almost inevitably faces pressures from interest groups of all stripes to use those powers in ways that further those groups’ own causes. The defining characteristic of such groups – whether their chief interests are financial, or ideological (in a broad sense of that word), or whatever – is that their causes are (in Adam Smith’s terminology) ‘partial’ or (in more modern language) ‘partisan’. Their objectives are narrower, usually much narrower, than the aim of achieving a

high-performance economic system. Even when the latter would advance their causes, particularly in the longer term, they importune government to do more for their narrow interests, or to do it more quickly.

The lobbying is, naturally, usually accompanied by arguments to the effect that the favoured measures would be of general benefit, but it is convenient for the interests concerned that there is no RH sub-system that has the capacity to give the justifying arguments a rigorous and comprehensive examination, on a well-informed basis and encompassing effects and implications across the whole economic system. As indicated earlier, the RH has functions that are inhibitory in nature, but importuning interest groups are better served by a system that is tolerant of the Ricardian Vice, of going directly from the LH to decisions and actions of direct practical significance. A LH system that doesn't 'see' wider consequences of their favoured uses of the state's monopoly powers suits these interests just fine. It is easier for them to manage it successfully in pursuit of their own, partial interests.

There tends, therefore, to be no influential interest group arguing for structural changes in Leviathan's brain of the type that we are indicating, and plenty of opposing voices that can be expected to be raised in the event that a future government does start to think seriously about systemically strengthening RH functionalities.

9. Resonances with an older wisdom

One of the most cited paragraphs of Adam Smith's under-read *Theory of Moral Sentiments* concerns what he called a 'Man of System', and it is worth citing in full because it implicitly sets out what are, in effect, two Gestalts, one underpinning the economic policy status quo of his time, about which he was highly critical, the other, in embryo form only, awaiting much fuller development in the *WoN*:

“The man of system, on the contrary, is apt to be very wise in his own conceit; and is often so enamoured with the supposed beauty of his own ideal plan of government, that he cannot suffer the smallest deviation from any part of it. He goes on to establish it completely and in all its parts, without any regard either to the great interests, or to the strong prejudices which may oppose it. He seems to imagine that he can arrange the different members of a great society with as much ease as the hand arranges the different pieces upon a chess-board. He does not consider that the pieces upon the chess-board have no other principle of motion besides that which the hand impresses upon them; but that, in the great chess-board of human society, every single piece has a principle of motion of its own, altogether different from that which the legislature might chuse to impress upon it. If those two principles coincide and act in the same direction, the game of human society will go on easily and harmoniously, and is very likely to be happy and successful. If they are opposite or different, the game will go on miserably, and the society must be at all times in the highest degree of disorder.”

In terms of the brain science metaphor we have been working with, the Man of System is Smith's personification of a LH dominated authority. He knows a lot about his own particular

model/ideology for government (“*is wise in his own conceit*”) and strongly attached to it (“*he cannot suffer the smallest deviation from any part of it*”). This is the hubris of the uninhibited LH. He does not ‘see’ the forces ranged against it, or ‘see’ that in his actions he is not dealing with passive chess pieces. Each piece “*has a principle of motion of its own*”. Complex natural systems are like that. The Gestalt is wrong and the game of human society “*will go on miserably, and the society must be at all times in the highest degree of disorder.*” In contrast, the embryo Gestalt is one of aligning government policy with what Smith might have called the ‘natural’ tendencies of the economy/society to be governed, a complex, ever-changing, adaptive system. If this alternative way of ‘seeing’ things is understood, and if the understanding guides actions, “*the game of human society will go on easily and harmoniously, and is very likely to be happy and successful.*”

The contrast button is again turned to maximum for rhetorical effect in the last two sentences, but, as indicated earlier, that was the way with Smith when making big points.

Our own expression of the fundamental argument is that it is not possible to align with the functioning of a complex economic system without first having a good understanding of how that system actually functions (a good Gestalt). That must be the starting point for all good economic strategy, and also the end checking point for LH plans and ideas, to ensure that they do align with the ‘laws of motion’ of the economic system. But the LH cannot understand that: it is not its operating mode, not its specialisation in the division of labour. Moreover, if a LH mode of a policy IAS is capable of establishing a Gestalt at all, it is likely to be implicit and of the ‘fat controller’ (Man of System) type, and that is not at all favourable for the material wellbeing of a nation.

10. First steps in the re-wiring of Leviathan’s brain

It is reported that, on his first day in the office as the new manager of Manchester City, Pep Guardiola put these words on the wall: “*Primer és saber què fer. Depre és saber com fer-ho!*” (First you have to know what to do. Then you have to know how to do it.) It is good advice.

In relation to what is to be done, our primary suggestion is to *add a lateralised RH functionality to Leviathan’s brain*. This would, in effect, amount to a deepening in the division of labour within government, so they are good reasons to expect that it would improve government productivity in the activities it undertakes, possibly very substantially, the defect to be corrected being a very major one. Since government activities have pervasive effects across the whole economic system, that first step could be expected to have wider beneficial effects across a much wider set of commercial activities.

The RH in human and animal brains is endowed with specialized responsibilities and what is distinctive about those responsibilities is their nature. Speaking broadly, they are to ‘see’, with wide, unrestricted vision, the world that lies outside Leviathan’s structures and to provide a first take on what is ‘seen’ and how it is changing. Critical to this is the insight that the field of

vision and imagination must include the interconnectivities between things and events which, not being manifest in raw sensory data, are very, very frequently ‘unseen’.

The RH tasks are radically different from the heavy duty, resource intensive administrative and analytic tasks that currently dominate government activity. They are directed at forming a moving picture of the system that is being governed. They call for combinations of capacities like curiosity, imagination, observation, vigilance, and detective work, applied across a wide field of vision. How to do establish the desired lateralisation requires more extensive thinking and we can only offer first step thoughts, though noting an old Irish proverb: ‘a good start is half the work’.

To mitigate the steady gravitational pull of increasing specialisation in narrowly focused activities and of routinization, what is required is an institutional architecture that ring fences vital RH functionality and ensures that radar-like ‘presencing’ of an ever-changing economic system is never turned off and is always on call for decision makers.

Arranging this is feasible; and enlightened thinking, both ancient and modern, has recognised necessary separation (lateralisation) as a route to social progress. Plato’s Academy was formed outside the city walls of Athens to offer less distraction than would be the case within them. Its subsequent influences on European thought have been enormous and incalculable, still reverberating in education today. As a further example, *speculae* (watch towers) formed part of the architecture of a Roman fort or city. They were set away from the main fort, so there was an inhibitory element or necessary distance built into them. By construction, these relatively small pieces of infrastructure ensured attention could be paid to things that were acknowledged to be relevant, but invisible at ground level within the main fort. Thus, the structure provided a helping hand to the broader fort ecosystem. A small, specialist team of experienced and vigilant minds (the guardians on duty) attended in a sustained, undistracted and differentiated way to situations that would remain ‘unseen’ from an everyday viewpoint, but which were (potentially) of vital importance to the whole.

We would argue that creating/designing an analogous, hemispheric brain topology for Leviathan is a *sine-qua-non* if of half-brained rationality is not to continue leading into serial, routine crises. The current network topology of government is ill-adapted to the economic (and social and political) contexts that it now faces. It attends far too much to activities concerned with power, control and coercion, to ‘grasping’ actions that are the focus of the LHs of human brains, at the expense of attending to the broad surveillance and understandings of the highly complex, ever changing, adaptive system that is the economy.

Government is seemingly locked into a monoglot LH structure by adverse feed-back loops, and the unwanted LH dominance has tended to strengthen over time. Without RH input, governments have become easy meat for the partisan lobbyists importuning Leviathan to use its monopoly power in ways that further their own narrow interests, without adequate consideration of their system-wide implications. A practical implication of these headwinds is, we think, that any reforms would need to be at very small scale in the first instance. The

conclusion is reinforced by the likely initial, limited supply of individual minds with the capacities to undertake the necessary tasks.

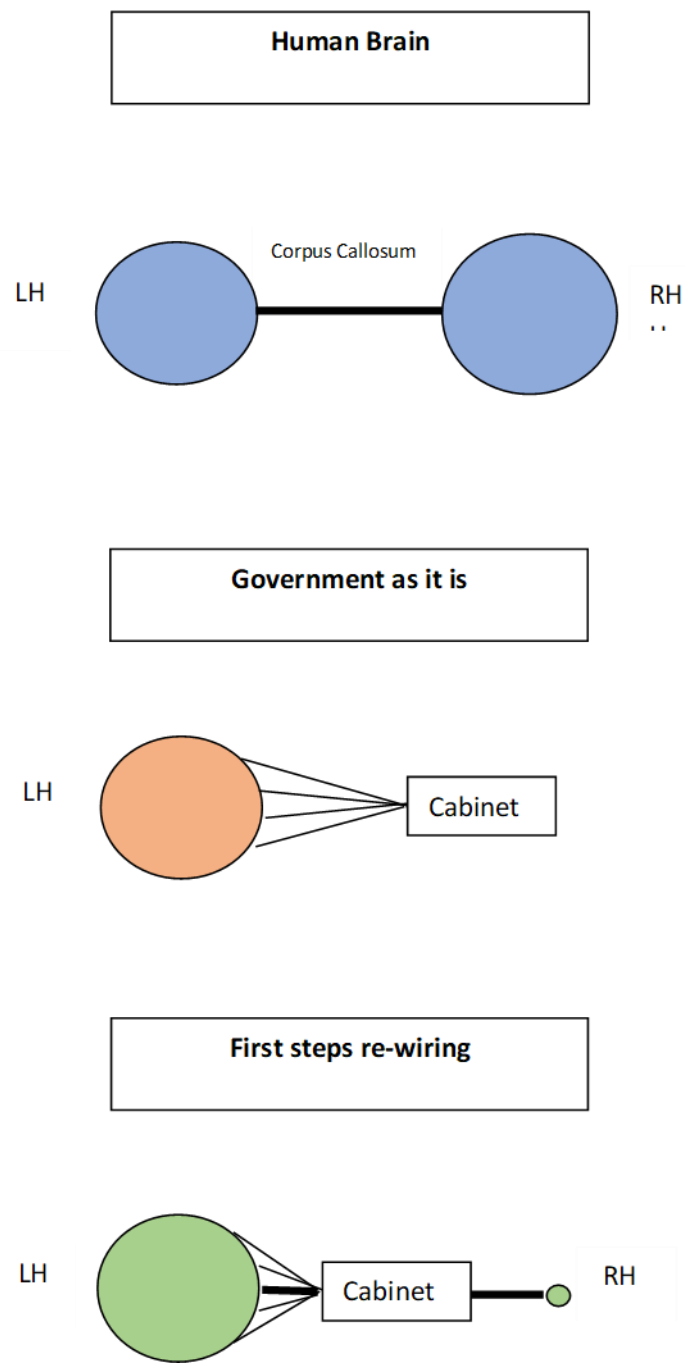
That would not fatally compromise the prospects of success. At the time of the UK utility privatizations (1984 to 1991), the new regulatory agencies were small in size, and that characteristic was instrumental in their success their early-stage development. At the outset, they were not big enough to be a significant threat to the interests of established parts of the much larger system. The situation changed later, over time. In an Animal Farm trajectory, the agencies became increasingly difficult to distinguish from regular government departments. One lesson to be learned from that, we think, is that in any future reforms, ‘lateralisation should mean lateralisation’: the RH must operate autonomously with responsibilities set in stone, not continually changed, as has happened, and is continuing to happen, to many regulatory agencies. That, however, should be easier to achieve than has been the case for sectoral regulators, because the LH and RH functions are much more highly differentiated in their natures than are the duties of specialist regulatory agencies.

Another challenge to overcome lies in the cognitive obstacles to reform that are always with us. Changing the network topology of government requires a re-imagining based on new design principles. For that, a new Gestalt will first be required, one that recognises and understands the nature of challenges that, for the present, remain ‘out of sight’. As argued, the metaphor of the human brain can yield important clues about how to go about doing that, but doing it is not an easy exercise: individual human brains are not easily flipped to a new Gestalt. Indeed it may be the hardest of all the steps to take.

We started with a picture of reproductions of stroke sufferers to a target stimulus, and will end with a picture showing massively stylised representations of first the individual human brain, then the structure Leviathan’s brain (a) as it is now and (b) how it could come quickly to look. The following can be noted of (a) and (b):

- (a) There is no analogue of either the individual human RH, nor of the corpus callosum. Organisational ataxia can be expected to be the default state.
- (b) The introduction of a distinct RH system (entailing a re-design of the division of labour) introduces a necessity for connection with the LH (the hemispheres do have to work together). As drawn, this is done via (in the UK) the Cabinet, which, in effect takes on the intermediation functions of the corpus callosum. There is no communication between the LH and RH other than by this route. The LH and RH are distinct ‘civil services’ and they do not directly interact with one another in unmediated ways. As indicated, the RH system will necessarily need to be very small to begin with.

Given the earlier remarks about LH dominance among senior politicians, it is unfortunate that the linkage of the LH and RH would seemingly have to be done through the Cabinet, but we can see no alternative to that in a democratic system. The RH influence will be significantly diminished as a result, but the negative effect might reduce in time as politicians come to recognise its value in improving system performance, and also to recognise that ‘seeing’



through a glass darkly (which can be expected to be their natural inclination) is, on an overall balance, more favourable to their own interests than not ‘seeing’ at all.

Over time, it can be expected that the RH would grow, but large numbers are not necessary, and probably undesirable: the relevant work is best done in small teams, the well-springs of imaginative thinking. As a sitting shot, we would suggest starting with something like the numbers of the teaching faculty at a mid-sized Oxbridge college.

On the other side of the coin, the inhibitory contribution of the RH to reducing organisational ataxia, a major driver of low productivity in the performance of government activities, could also be expected to shrink the LH over time, which, given the latter's size, could be expected to have the much bigger effect on resource requirements.

There is a journey to be made here. We end, therefore, with a suggestion, made previously by one of the authors, that a good first step would be to establish a specialist 'Government Economic Intelligence and Strategy Service (GEISS)', dedicated to continuous, wide horizon scanning of the economic environment, seeking to 'see' both threats and opportunities in ways that can be routinely 'presented' for Ministers.

Such a service could serve as a trigger or selection mechanism for LH analytic work on identified threats and opportunities. If all major decisions, say by Ministers, were required to take account of GEISS assessments, it would serve to mitigate the dominance/monopoly of LH thinking. It would meet the requirements for balanced judgments identified by both Alfred Marshall ("*always bring the analytics back to real-world contexts*") and Keynes's criterion that the 'particular must be contemplated in terms of the general'.

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