

## **Biology, Politics and Democracy**

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A great deal of contemporary Anglo-Saxon “social science” is concerned with sheltering the disciplines of economics, politics and sociology from the subjectivity and inaccuracy it attributes to the pre-scientific originators of these subjects. This tendency has been reinforced by ever increasing specialization in each of these fields (reflected in our university by the divisionalization that took place in 2000) and by the desire of many of the next generation of young professionals to differentiate themselves as clearly as possible from what is often viewed as the irrationalism, or at least the woolly mystifications, that seem in the ascendant in various parts of the humanities and cultural studies. It is in this spirit that so much effort has been invested in the methods of precise causal attribution, quantification, and replicable verification that have been borrowed (I would say uncritically and inadequately) from the physical sciences. Other facets of the broad social scientific tradition, such as the philosophical foundations required to underpin methodological practices; the history of theory; the linguistic foundations of social explanation and social understanding; and the corroborative evidence to be derived from a decent familiarity with relevant historical narratives and from ethnographic observation; have all tended to atrophy as this narrowly “scientific” perspective took hold. My career has spanned this transformation, and since it has focussed mainly on Latin America I have probably been more exposed than most to a succession of one-sided attempts to restrict the field in accordance with each of these precepts, and to observe that whenever a discipline leans too far in one direction to the exclusion of the alternatives it stimulates a backlash. Such experience leads me to prefer methodological pluralism: the social phenomena we seek to understand and explain demand multiple techniques of investigation. Too narrow an emphasis on an inadequate toolkit leaves so much unaccounted for that an alternative approach is necessary to fill the analytical void. Certain topics can be fully dealt with by the use of a very limited repertoire of methods, but most of what is worth understanding about social, economic, and political behaviour spills over well beyond such confines. In particular, I have concentrated on the comparative study of contemporary processes of democratization, and at least for that purpose the approved methods of precise causal attribution, quantification and replicable verification need to be supplemented by all the broader approaches listed above.

This paper is an extension to some work on “enlivening” the concept of democratization that I am presenting in other fora. That work falls under the general rubric “the linguistic foundations of social analysis” and therefore takes me closer to work in the humanities than is fashionable in contemporary political science. My intention is not to disregard the value of more mainstream approaches, but only to offer some complementary input, hopefully presented with sufficient rigour and clarity to persuade the next generation of young professionals that here too useful insights can be generated.

The central thesis of my “enlivening” paper is that most current work on comparative democratization relies on (or perhaps even actively invokes) unanalysed mechanistic metaphors and constitutive analogical structures. I argue that these are often

misleading and frequently ossified. They can be productively refreshed and indeed “enlivened” by the introduction of substitute imagery drawn not from engineering but from the life sciences. More ambitiously, the paper concludes by suggesting that it may be more appropriate to reframe democratization studies through the wholesale adoption of analogical structures drawn from biology as substitutes for the current physicalist imagery. (To avoid misunderstanding I should also stress that the paper ends by recognizing the limits, as well as the benefits, of this type of linguistic exercise).

This paper addresses a distinct, but closely related, issue. It belongs more to the “history of theory” approach than to the “linguistic foundations” perspective, although to some extent bridging the two. There is a long, and troubled, history of importing biological ideas into the study of politics. In order to tackle resistance to my suggestion it is appropriate to review some aspects of this history, notably the grounds it has provided for fearing that biological analogies are liable to serve anti-democratic purposes.

My general view is that all interpretative imagery can, in principle, be appropriated for questionable purposes – that is why political language should always be subject to critical scrutiny. It is also true that biological analogies have a particularly problematic track record in this regard. However, my claim here is that the relevant stock of contemporary biological concepts and ideas contains much that is both refreshing and appropriate for the comparative study of present day democratizations. So, the “social Darwinism,” “corporatism”, and hierarchical functionalism of earlier biological importations into political analysis need not deter us from taking a fresh look at how this discipline compares with mechanics as a source of concept formation in politics. Even the “selfish gene” could yield some insights about the individualistic foundations of some collective political practices, insights that are not inherently anti-democratic.

However, an appeal to the life sciences as a source of theoretical inspiration can be resisted on at least two grounds. First, the mainstream social scientist assumes (rather than demonstrates) that the safest, most appropriate, and most “scientific” model for their disciplines is drawn from the study of the inanimate world (physics, engineering and the like), where the observations are “external” to the objects being observed, and where the classes of objects to be classified and enumerated are (at least supposedly) fixed and given. My “enlivening” paper sets out my grounds for believing that these characteristics of the physical sciences are precisely what make that field of enquiry a poor source of guidance for the study of the human sciences, and of democratization in particular.

Here, I address the second likely ground of resistance. Insofar as the life sciences in general and biology in particular offer additional lessons for the social scientist, a mainstream social scientific view would probably be that such lessons are precisely the opposite of what this paper is attempting to do. From this perspective, by leaving behind “vitalism” and “phlogiston,” and suchlike vacuous categories, scientific advance in biology has embraced ever more rigorous experimental methods, more precise quantification and more disaggregated causal attribution. Darwin started us down the road that led to the discovery of the genetic code and all the consequent advances in medical science bio-engineering, bringing the life sciences into alignment with the physical sciences and setting another high standard of methodological rigour for the social sciences to learn from. Population genetics, sociobiology, and the other new areas of study such as the modelling of “self-organization” in complex networks provide lessons in how to achieve cumulative advance in scientific knowledge, lessons that

threaten to relegate old-fashioned social theory and moral philosophy to the same camp as the humanities – headed towards the redundancy of most theology faculties. For those of this persuasion it seems that metaphors, analogies, literary theory, hermeneutics, even the history of scientific thought are all backward-looking, residues, about as relevant as the medieval schoolmen and with about the same amount of value in the modern world .

But against that view I would argue that, even the hard sciences sometimes can become dependent, upon vivid imagery imported from other domains (think of the “Big Bang” in cosmology or “Schrödinger's cat” in sub-atomic physics). The “double helix” is just such an image, and the cutting edge work modelling the emergence of life Stuart A. Kauffman, is littered with verbal images such as “adaptive landscapes”, “rugged fitness”, and even “order on the edge of chaos”. (Although my focus is democracy and democratization, there are good grounds for thinking that this is the right approach in many fields, including the natural sciences, since all creative thinking involves the imaginative re-interrogation of established assumptions). However that may be, those of us whose object of enquiry is democracy and democratization should not have too much difficulty in demonstrating that these are not empty categories. Moreover, they remain subjects of the highest practical as well as scholarly relevance in the contemporary world. They raise big issues and attract strong interest from policymakers and public opinion leaders as well as academic specialists, so it is only to be expected that this field will evoke vivid imagery and, indeed, heated controversy as well as scholarly curiosity. Both facets merit close study.

Language games can be investigated with the same rigour as is applied to empirical data bases. So there should be no assumption that pursuing this type of enquiry necessarily involves opposing rigorous experimental methods, precise quantification, or disaggregated causal attribution (including replicable methods of concept formation and hypothesis testing by neutral experts). For some purposes, such methods can advance knowledge and perhaps even establish truths that would otherwise remain in doubt. But at least in the social sciences other well established and finely honed methods are often equally relevant - careful historical analysis may do as much to advance knowledge of democratization processes, for example; and rigorous conceptualisation may be just as important. So multiple methods of investigation deserve encouragement, and that includes work on the kinds of cross-boundary borrowings and analogies investigated here.

The essential case for methodological pluralism rests on the benefits of encouraging all these techniques insofar as they help us to address the important questions that concern us. So multiple approaches are worth exploring, and this particular paper engages in comparative politics through a literary line of enquiry, one most relevant to concept-formation and causal attribution (“understanding” in my parlance). In broad terms this concerns the hermeneutics, the analogies, the linguistic images, and the history and structure of conceptualization pertinent to our subject.

The paper makes some borrowings from biology in order to free us from the ossified imagery we have accumulated from the physical sciences, rather than to subordinate our field to an alternative source of “scientific” authority. I therefore need to sketch out what aspects of biological reasoning I have in mind, given my view that the life sciences cannot be reduced to sociobiology and genetic engineering alone. This also permits me to picture the reciprocal influence between the life sciences and the social

sciences (both of which should – and do – practice more methodological pluralism than some of the stricter political science disciplinarians realise). This paper also aims to dispute the historically established belief in the social sciences that borrowings from biology necessarily serve an ideological purpose (typically conservative and indeed anti-democratic).

Ideas about political behaviour have been intertwined with views about human nature, and by extension about the place of humanity in the hierarchy of life, ever since the earliest days of social theory. A useful reminder of this foundational imbrication of political theory and biological reasoning can be found in Larry Arnhart's attempt to rescue Aristotle's conception of man as "political animal" from the assault launched by Hobbes. This author's main aim is to align Darwin with Aristotle and in contrast to Hobbes. For this purpose he seeks to rescue what he calls Darwin's "original position" from Huxley's misrepresentation, according to which the biological "struggle for existence" must be understood as a war of all against all, in which there would be no ground for social cooperation or moral concern.

Huxley's distortion followed the Hobbesian claim that whereas cooperation among some animals was due to their nature, humans as articulate bearers of reason were fundamentally different, and any agreement between them would therefore be by covenant only, and so would not exercise restraint on conflict in a state of nature. What Darwin himself tried to defend was a more Aristotelian position, according to which many animals, to varying degrees, satisfy their needs through social learning and flexible behaviour, in which respects humans differed only in degree, but not in kind, from other animals. At the same time, in Darwin's view the greater complexity of human learning and social interaction provides the foundation for morality. Indeed, in contrast to Hobbes and Huxley, Darwin thought that an asocial human being lacking in sympathy for other human beings would be "an unnatural monster."<sup>1</sup>

Darwin has some claim to authority within the biological sciences, so let us consult the *Origin of Species*. Here is what he says about two of his crucial terms: "I look at the term species as one arbitrarily given, for the sake of convenience, to a set of individuals closely resembling each other, and that is does not essentially differ from the term variety, which is given to less distinct and more fluctuating forms. The term variety, again in comparison with mere individual differences, is also applied arbitrarily for convenience's sake."<sup>2</sup> Readers will note the "stipulative" nature of these definitions, but also that they are derived from induction and cognizant of the overlap between categories (and also the justification of this on the Aristotelian grounds that its rigour corresponds to what can be observed about the topic under investigation).

How about the use of metaphors? Here again is Darwin: "In the literal sense of the word, no doubt, natural selection is a false term; but who ever objected to chemists speaking of the elective affinity of the various elements.... who objects to an author speaking of the attraction of gravity as ruling the movement of the planets? Everyone knows what is meant and implied by such metaphorical expressions; and they are almost necessary for brevity. So again it is difficult to avoid personifying the word Nature; but I

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<sup>1</sup> Larry Arnhart, "The Darwinian Biology of Aristotle's Political Animals," *American Journal of Political Science* 38 (2), 1994, especially p. 472 and p. 479.

<sup>2</sup> Charles Darwin, *The Origin of Species*, Mentor Edition, 1958, p. 67.

mean by Nature, only the aggregate action and product of many natural laws and by laws the sequence of events as ascertained by us.”<sup>3</sup>

It would therefore seem that Charles Darwin, at least, practiced a disciplined form of methodological pluralism, and consciously invoked metaphorical imagery to galvanise his process of concept formation. Darwin explicitly acknowledged his debt to Herbert Spencer for the term “survival of the fittest,”<sup>4</sup> and some analysts of his thought claim that his theory was inspired by Malthus (although this is controversial). It was not long before Walter Bagehot took up his ideas in his *Thoughts on the Application of the Principles of Natural Selection and Inheritance to Political Society*, and thus promoted the crossover that interests us here. What facilitated this boundary crossing was not just the shared gentlemanly culture of these Victorian authors, but also the fact that Darwin combined a commitment to “objective” and systematic comparative research with an underlying value orientation.

As noted above, a lot of social Darwinism seems clearly at variance both with his scientific conclusions, and also with his humanitarian political outlook. As the scion of a family committed to the cause of anti-slavery, he was in part motivated by his attachment to the doctrine of human brotherhood, and therefore to the associated belief in human racial unity. This may also help to explain why Marx expressed such enthusiasm for the *Origin* in a letter to Engels (although using such untranslatable and unappreciative German adjectives as “grob” and “plump, clumsy, clownish” to characterize English methods) At any rate Marx was positive enough to invite Darwin to accept the dedication of *Das Kapital* on its first publication. Although keen to avoid such controversy Darwin was clearly aware that his contribution to biology, evolution and social thought was not purely the product of a disembodied neutral scientific enquiry. Indeed, according to Desmond and Moore’s he knew his findings were profoundly value laden.<sup>5</sup>

But of course, that was Victorian Britain. Since then the sciences have become more specialized and professionalized. We now know, as he could not, that all living organisms are regulated by genetic codes which can be precisely deciphered and indeed replicated. At first some biologists may have drawn the inference that Darwin’s initial loose metaphorical images could thenceforth be superseded, possibly even converting biology into a science characterized solely by mechanistic type models of genetic or molecular reductionism. But although that outlook can still be detected in some publications it is far from being the dominant viewpoint in the modern life sciences.

Thus, when Steve Jones, a leading professor of genetics, produced a tribute to Darwin’s “Origins” intended to incorporate the modern synthesis, he scanned many fields of research: “The clues from fossils, genes, or geography-differ in each case, but from all

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<sup>3</sup> Ibid., p. 88.

<sup>4</sup> Stephen J. Gould adds that it was Spencer rather than Darwin who popularised the word “evolution” (in place of “decent with modification”) and shows that it was Spencer who took the idea of describing society by means of organic analogy to the most implausible extremes, e.g. “The likening of a primitive all-powerful monarchy with a simple brain, and an advanced parliamentary system with a complex brain composed of several lobes.” S. J. Gould, *The Lying Stories of Marrakech*, New York: Vintage, 2001, p. 262. Evolution is discussed on pages 258-9.

<sup>5</sup> Adrian Desmond and James Moore, *Darwin’s Sacred Cause: Race, Slavery, and the Quest for Human Origins*, London: Allen Lane, 2009.

of them comes the conclusion that life is kin. That is no mere assertion, but a chain of deduction with every link complete.” Jones constructs an account which gives full recognition to all the gaps in the evidence, and the many plausible objections that can only be countered by a plurality of methods. For example, he argues that the science (and art) of cladistics (impartially mapping affinities of extinct and extant groups of organisms with shared traits) has transformed our view of life’s tree to an extent comparable with the findings of genetics. Similarly, to explain the grand leading facts of the geographical distribution of varieties of life requires systematic analysis of the various types of barriers that impede their migration, together with the physical characteristics of the new locations they may selectively occupy.<sup>6</sup>

Both the techniques for constructing an inclusive classificatory schema, and the models of spatial diffusion and differentiation, that have been developed by modern biologists should be of as much direct interest to students of comparative politics as the genetic reductionism that too many of our professional colleagues currently associate with scientific “best practice.”

Thus, it seems that in this field it is still the nature of the phenomenon under study, rather than the professional techniques available to the researcher, that determines the range of methods worth pursuing. In addition to those mentioned above one could add embryology, cell science, neuroscience, mathematical modelling of self-organizing systems, ecology, evolutionary developmental (evo devo) biology, and no doubt many more overlapping and mutually reinforcing research approaches. This pluralism of perspectives and methods need not give rise to fragmentation of the overall field of enquiry. To the contrary, all these flourishing sub-disciplines come together around a unifying set of research questions still rooted in Darwinism. So if the political sciences aspire to borrow from successes in the natural sciences, rather than confining themselves to an extremely narrow and mis-specified transfer of one technique only, contemporary life sciences provide an encouraging stock of resources to draw from.<sup>7</sup>

But perhaps I should supply some further evidence for the claim that, contrary to the frequently naïve assumptions of social scientists with an inferiority complex about “real” science – the genetic reductionists have not swept all before them. As Sean B. Carroll, Professor of genetics at Madison, Wisconsin, outlines in his popularization of the “new science” of evolutionary development, embryologists now construct “fate maps” of early embryos to reveal how initially undifferentiated individual cells react to their relative positions and thus give rise to complex organic structures:

“Fate maps” reveal that, by some point in development, cells “know” where they are in an embryo and to what tissues or structures they belong. In terms of our “geography” analogy, cells, tissues and organs have a specific position on the globe of the embryo

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<sup>6</sup> Steve Jones, *Almost Like A Whale*, New York: Doubleday, 1999, chapters 12 and 13.

<sup>7</sup> Here I am only echoing W. J. M. Mackenzie’s old ambition to place political science “end-on” to the biological sciences. Following Sir Peter Medawar, he regarded political science (insofar as it is to claim scientific status) as a “special case” of biology, which in turn was a “special case” of chemistry, itself a derivative of physics. “As we go down the line, the sciences become richer and richer in their empirical content....but at the same time they are looser in texture, fuzzier in outline, subject to revision.” J. J. M. Mackenzie, *Biological Ideas in Politics: An Essay on Political Adaptivity*, Manchester: Manchester University Press, 1979, pp. 92-3.

defined by their longitude, latitude, altitude (if projecting out from the body) and depth (within layers of the body), as well as a “national” identity (nerve cells, liver cells, etc.). All cells are descended from the initial single fertilized egg. It is obvious that a whole lot of information must be generated in the course of development to create unique addresses for dozens of cell types, tissues, and organs at specific positions in the embryo. How do cells ‘learn’ their positions and identity?”<sup>8</sup>

This passage was worth quoting at length from a contemporary (popularizing but nevertheless serious and respected) guide to current biological research, first because it pinpoints the limitations of static atomistic causal attribution (“reductionism”) for explaining complex developmental processes; and second because it contains such a rich harvest of metaphorical images and analogies drawn from social life.

Stuart A. Kauffman’s challenge to genetic reductionism comes from a very different direction. He develops theoretical models of self-organization and selection for adaptive evolution, in which it is the “ruggedness of the fitness landscape” rather than the self-templating character of the genetic molecule that guides the emergence and development of life. His is a view of what theory says is possible, rather than demonstration of what the evidence shows to be the case. Not surprisingly, then, it is controversial and may not in the end prevail over more traditional interpretations. Still, from our point of view it demonstrates the benefit of addressing fundamental issues using diverse analytical techniques. And, his major conclusion – concerning the utility of random grammar models – has the widest possible relevance, not only in the life sciences but also potentially in social science. Here is his key claim: “Such grammar models afford a new framework for thinking about the emergence of functionally integrated systems which interact with, and represent, and *know* their worlds. These systems provide models for the emergence of competition and collaboration between self-reproducing molecular systems and perhaps even functional integration and transformation in economic and cultural systems. Indeed, grammar models are natural test-beds for understanding the interweaving of historical contingency with its avalanches of consequences cascading from frozen accidents, and the dominion of law, in biology and other deeply historical sciences.”<sup>9</sup>

On a different but perhaps equally controversial note, let me add some evidence that contemporary biology includes serious work of a kind compatible with my approach to comparative democratization is the recent book by Steven Rose which aims to reintroduce philosophy into biology. He is a controversial figure in this field, but as a

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<sup>8</sup> Sean B. Carroll, *Endless Forms Most Beautiful: The New Science of Evo and Devo and the Making of the Animal Kingdom*. PLACE: Phoenix, 2006, pp. 89-90.

<sup>9</sup> Stuart A. Kaufman, *The Origin of Order: Self-Organization and Selection in Evolution*. Oxford: Oxford University Press, 1993, p. 286. He acknowledges that some of his key concepts, such as “grammar models” are actually heuristic metaphors. In a further nod towards the social sciences, he sums up his bold proposals for a theory to explain the morphology of living organisms with the following observation: “One is always aware of the intellectual error, whatever it was, which allowed James Mill, John Stuart’s father, to deduce from first principles that a constitutional monarchy remarkably like that in England was the highest form of government. We stand in considerable danger of falsely deducing the inevitable existence of what we observe. What might we want in our theory? Design principles, of course...” Ibid., p. 641. Theoretical biologists draw lessons from the history of political thought, and that traffic can usefully flow in both directions.

neuroscientist and professor of biology, Rose has the credentials to demonstrate that this discipline still accommodates multiple perspectives on theory and methods. I have selected the following three passages from his concluding ten point manifesto, aimed to “make biology whole again”:

“2 *One world, many ways of knowing* For any living phenomenon we observe and wish to interpret, there are many possible descriptions. ... These accounts cannot be collapsed into “one true” explanation in which the living phenomenon becomes “nothing- but” a molecular assemblage, a genetic imperative, or whatever. It all depends on the purposes for which the explanation is required.... Biology, and the life process it studies, will not conform to the proud manifesto of physics that the task of science is to reduce all accounts of the world to unitary theories of everything....”

“6 *Stability through dynamics* “Organisms are open systems, far from thermodynamic equilibrium, in which continuity is provided by a constant flow of energy through them. Every molecule, every organelle, every cell, is in constant state of flux, of formation, transformation and renewal. Dynamic stability of form persists, although every constituent of that form has been replaced. This stability, often maintained through oscillatory processes, depends on the capacity of complex interacting systems to self-organise, so as to maintain both short – and long – range order...”

“10 *Life constructs its own future* Thus for humans, as for all other living organisms, the future is radically unpredictable. This means that we have the ability to construct our own futures, albeit not in circumstances of our own choosing. And it is therefore our biology that makes us free.”<sup>10</sup>

Those three excerpts are taken from a longer manifesto that should be read in its entirety as a corrective to the idea that modern biology only offers one narrow model of scientific rigour that could be of any relevance to the social sciences. It is not necessary for non-biologists to embrace Rose’s vision of biology. All that is needed is to acknowledge that this debate is ongoing. If the social sciences are to borrow from the natural sciences then, at a minimum, they need to be informed about the current controversies affecting the subjects they wish to draw from. If more developmental and holistic perspectives still have some traction in the life sciences then they cannot simply be ruled out as “anti-scientific” when seeking lessons for our field.

Readers will also have noted that all four sources quoted above – Darwin, Carroll, Kauffman and Rose – have drawn some of their inspiration from outside their own discipline, including from the social sciences (as these were known to them). Darwin refers to Spencer; Carroll invokes metaphors from geography; Kauffman discusses James Mill; and Rose alludes at least indirectly to themes in social theory. There is a process of reciprocal exchange here, not just one-sided borrowings. If such exchanges are to be productive they require each side to take a serious interest in the epistemological challenges confronting the other side.

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<sup>10</sup> Steven Rose, *Lifelines: Life Beyond the Gene*. New York: Vintage, 2005, pp. 304-309.

From this quick sketch it would seem to follow that there is still scope for the social sciences in general, and for students of comparative democratization in particular, to exchange imagery and conceptualizations with the natural sciences in general, and the life sciences in particular. But to conclude this paper I also need to confront the reasons why social scientists of my generation had come to resist the import of biological metaphors into their field. In particular, during much of the twentieth century it seemed that however innocently intended, such transfers had acquired transparently ideological overtones. The kind of biology that inspired the last generation of political metaphors was often found to be deeply conservative and indeed even anti-democratic in its implications. However, my concluding point is that contemporary biology is not the same as before. Current theories and concepts in the life sciences are therefore not necessarily tainted with these illiberal associations.

Although it is always vital to guard against the hidden assumptions that can get smuggled into any type of model of a social explanation, there is no reason in principle why metaphors and analogies drawn from current biological thinking need to carry anti-democratic connotations. From the physiocrats through to Alfred Marshall, biological analogies were frequently invoked in the history of economic thought, just as from Hobbes onwards political theorists compared the state to a person, and Spencer and Durkheim compared society to an organization... Similarly the “new liberalism” of pre-First World War England was heavily influenced by Darwinian ideas about evolution. As Michael Freeden notes, “evolutionary theories could be harnessed in important ways to different political ideologies. Conservatives could, and did, seek support from evolution for their stance of non-intervention in a social balance, based on what they believed were natural aggressiveness and competition, and justified a limited role for the state in supporting the disadvantaged. Left-liberals and evolutionary socialists saw the emergence of regulatory social institutions as the very reflexion of the rise of collective reason which the evolutionary process dictated.”<sup>11</sup> For example, D. G. Ritchie concluded that “the conception of society as an organism seems to admit of more easy applications to defence of just those views about the State which Mr. Spencer most dislikes,”<sup>12</sup> and for L. T. Hobhouse, “the organic theory of society assisted in establishing the dual centrality of liberty and sociability – would be ‘destroyed or vitally altered’ when removed from society. It equally asserted that ‘society consists wholly of persons. It has no distinct personality separate from and superior to those of its members.’ It associated rationality and harmony, suggesting that the drive to harmony was ‘a persistent impulse of the rational being.’ And it linked these with the flutterance of the collective life of a society, so that it was ‘harmonious interaction, the response of each to each that makes a society a living whole.’”<sup>13</sup> And under J. A. Hobson: “Individualism was ingeniously detached from the individual as the unity of analysis and extended to serve the interest of society – now installed as the second, co-equal social unit. Liberty and social welfare was aligned

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<sup>11</sup> Michael Freeden, *Ideologies and Political Theory*, Oxford: Oxford University Press, 1996, p. 198. He also reviews the different impact of Darwinian ideas on political theory in France and Germany.

<sup>12</sup> Ritchie’s *Darwin and Hegel*, quoted in *ibid.*, p.204.

<sup>13</sup> Hobhouse’s *Social Evolution and Political Theory*, quoted in *ibid.* p. 204. (He wrote *Social Evolution and Political Theory*).

through the organic resolution of the tension... between individual rational activity and the general interest. The pursuit of personal liberty was an integral aspect of social health; the guaranteeing of welfare was indispensable to a concept of liberty that embraced growth, development, and flourishing".<sup>14</sup>

It is also well known that before the Second World War biological ideas were recurrently enlisted in the cause of racial oppression and discrimination against the handicapped ("eugenics") and metaphors about the social "health" of a nation and its need for defences against "infection" were used to justify authoritarian and fascist political programmes. There was also a significant strand of eugenic thought on the left, until Nazism exposed its implications. Even after the Second World War some biological analogies persisted through inertia in various areas of social thought. They penetrated the social sciences at least until the liberal counter-attack of the 1960s.

The example of the Harvard "Pareto Circle" can serve as an illustration.<sup>15</sup> Sponsored by the Professor of Biological Chemistry, Lawrence J. Henderson, it counted among its disciples such celebrated sociological functionalists as Robert Merton, Talcott Parsons, and George Caspar Homans, together with the well-known historian and political analyst of comparative revolutions, Crane Brinton, and the celebrated economist Joseph Schumpeter. Professor Henderson lent his authority as a biologist to the study of society through his *The Order of Nature and the Fitness of the Environment*. Henderson was actually a haematologist and his main contribution was on the physiology of blood, so it is hardly surprising if he focused on homeostasis and how circulation can serve to maintain stability within an organism. As a result he was drawn to Vilfredo Pareto's theory of elite circulation to stabilize society. Pareto's ideas were taken up by his circle as a social science counterpart to this approach, because Pareto saw society as "a system of mutually interacting particles which move from one state of equilibrium to another." The related ideas of system functionality and equilibrium were thought to provide the bridge between biological and societal processes, with the implication (as expressed by Homans) that "society is an organization and ....like all organizations if a threat is made to its mode of existence, a society will produce antibodies which tend to restore it to its original form."<sup>16</sup>

For the purposes of this paper much the most significant member of the Pareto Circle was Joseph Schumpeter who, although by profession an economist, has provided political science with a canonical stipulative definition of democracy. In keeping with the tenets of the Circle, Schumpeter proposed to limit the concept of political democracy, restricting it to a procedural arrangement designed to smooth regularize and legitimize the circulation of ruling elites.<sup>17</sup>

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<sup>14</sup> J. A. Hobson, *Work and Wealth*, published in 1914, as summarised in Freedman, *ibid.*, p. 205.

<sup>15</sup> See Barbara S. Heyl, "The Harvard "Pareto Circle" *The Journal for the History of the Behavioural Sciences* 4 (4) October 1968.

<sup>16</sup> G. C. Homans and C. P. Curtis, *An Introduction to Pareto: His Sociology*, New York; Knopf, 1934, pp. XX. Later on Homan's drew back from this position.

<sup>17</sup> For seventy years the PRI in Mexico observed a fixed electoral calendar and the no re-election rule thus promoting political stability through the smooth circulation of an elite, without in other respects practising full democracy.

Against this background it may suffice to note that such a static and naturalized view of equilibrium is no longer the master concept in biology and the life sciences (if it ever was, even in Henderson's time). It has since been "punctuated" by Stephen Jay Gould, and sidelined by evolutionary development (Carroll's evo devo theory). It is also challenged by the homeodynamics of Steven Rose; not to mention the more complex picture of co-evolution and adaptation "to the edge of chaos" proposed by Stuart Kauffman. What all these various contributions to modern biology have in common is that they propose techniques for analyzing and explaining the diversity, complexity, interconnectedness, and directional thrust of living organisms – even including the larger biosphere – by identifying underlying regulatory principles that generate change, rather than restore traditional stability. Whatever difficulties these contributions may still confront, and however much they may differ between themselves these techniques and conceptualization have in common not just the desire to isolate regularities in nature ("natural laws"). They also share the recognition that the living realities that they study are dynamic, developmental, and in a permanent process of emergence. For that reason the stable categories and given laws that may still characterize inanimate matter may no longer be adequate for the life sciences.<sup>18</sup>

This contention can be briefly illustrated by reference to the contributions to modern biology made by James Lovelock (concerning the most aggregate and holistic characterization of life); by Stuart Kauffman (on the question of the dynamics of co-evolution between multiple interdependent species in a complex ecology); by Sean Carroll (evolutionary development of organisms within each species); and Steven Rose (biology within an organization but beyond the gene, i.e. homeodynamics). These very diverse sources all share the one characteristic that matters for the purpose of this paper – they offer parallels and analogies that can be ruined by students of democratization without importing illiberal preconceptions or the reactionary connotations.

For example, James Lovelock's test for the existence of life (initially on Mars, but in practice anywhere) is "negative entropy", i.e. the reverse of thermodynamic and chemical equilibrium. The essence of life is that it feeds on an energy source, to make entropy "run backwards," at least within a localized biosphere. It is thus the opposite to the state of equilibrium postulated in the physicalist models of causal determination that are still unthinkingly celebrated by too many traditional social scientists.

Similar considerations apply to modern theories of co-evolution and the development of ecosystems. Here too equilibrium is no longer the norm. "Over an extremely wide range of possibilities, whatever conditions you start out with and whatever shocks you apply to the living system (external or internal, or both) you arrive at the self-organised critical state on the edge of chaos, where even a small trigger can on occasion, produce a very large change in the system as a whole. Life really is like that."<sup>19</sup> This perspective- elaborated, for example, by Kauffman – incidentally offers a source of

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<sup>18</sup> There are grounds for doubt whether even the physical world is completely exempt from these objections to a mechanistic worldview. See, for example, Werner Heisenberg, *Physics and Philosophy*, London: Penguin, 1989, especially chapters 10 and 11. But all I need here is to show that mechanistic reductionism is under challenge in the life sciences. On the broader issue see John Gribbin, *Deep Simplicity: Chaos Complexity and the Emergence of Life*. London: Penguin, 2004.

<sup>19</sup> *Ibid.*, pp., 197-8.

biological analogies for modelling the spread, and also the reversal, of democratization processes both within and between political communities. The Yale geneticist Sewall Wright elaborated the analogy with a “landscape” in order to model the spread and distribution of successful evolutionary strategies- a dynamic and context-sensitive image that has evident social and political applications. All this offers another sharp contrast to the “system-maintenance” functionalism that characterized mid-twentieth century conservative social theory.

Sean Carroll’s analysis of evolutionary development within species is of necessity fairly “functionalist” in approach. However, it differs markedly from the restrictive homeostatic type of functionalism that so appealed to the 1930s conservatives of the Pareto Circle. For example, here is what he identifies as the “four secrets of evolutionary innovation: “The first secret of evolutionary innovation is without a doubt, to work with what is already present.... nature works more like a tinkerer, by working with and cobbling together available materials and constantly modifying and retouching structures over eons, and not as an engineer would with a preconceived plan and specialized tools... The second and third secrets, multifunctionality and redundancy, were first recognized by Darwin ... Any part of a multifunctional structure that is at least partially redundant in function sets the stage for specialization... The fourth secret is modularity... [which] allows for the modification and specialization of individual body parts, sometimes in the extreme, independent of other body parts.”<sup>20</sup> So correctly understood, modern biological functionalism is far more flexible and pluralist than the tightly regulated imagery that so appealed to social conservatives. Democratization theorists can feel comfortable borrowing appropriate analogies from here.

Moreover, modern biology differs from the version practiced during the fascist era, in that the integrative and homeostatic characteristics of the whole organism is now mainly analysed from the bottom up (along the lines favoured by Hobson, as quoted above) whereas previously it was mostly studied from the top down. The authoritarian model of the healthy organism was always a distorted way to analyse political life, but for a period it gained plausibility from the assumption that all living organisms should be viewed as integrated self-equilibrating entities. Under modern conditions, even this slender shred of plausibility is lost, since it is the component cells in any multi-cellular life form that must provide the key focus of attention – not that any style of biological thought (s“survival of the fittest,” the “selfish gene”) translates mechanically into the analysis of social life. It bears repetition that analogy is not homology, and should never be used as such.

There is evidently still much scope in modern biology for top down or holistic perspectives on the structure of life, but these no longer focus on static equilibrium and functional integration. Instead they tend to stress dynamic adaptation, co-evolution, and the emergence of successive complex interactive networks that are largely governed by principles of self-organization. James Lovelock’s still controversial “whole earth” approach to planetary biology was stimulated by the images of a blue orb sent back by the first spacecraft. This, plus the question how to tell whether there was life on Mars, prompted him to re-examine very familiar material from a radically different perspective, generating first the “Gaia hypothesis” and what may now be more properly called Gaia

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<sup>20</sup> Carroll, op. cit., 194-5.

theory. Whether or not his particular proposals stand the test of further research, the agenda he established has reinvigorated the life sciences and demonstrated the viability of scientific research into all known life as a unity.<sup>21</sup>

Of course different techniques are required to grapple with the subject on this scale as opposed to at the level of the species, the organism, the cell, or the gene. It is the nature of the phenomenon under investigation that should determine the techniques to be applied, rather than vice versa. There are lessons here for the social sciences, in favour of methodological pluralism and openness to borrowings from other disciplines. For example, anthropogenic climate change is a phenomenon that urgently requires the attention of, among others, the political science community. The techniques required to analyse the politics of humanity's global environmental impact are not necessarily at all similar to those we insist on for research into voting behaviour or the production of legislation. They may be more holistic, more cross-disciplinary, and may require theoretical innovation. Modern life sciences offer encouraging examples of the kind of eclecticism we need to encourage in the political sciences as well.

Holism also has much to offer at the level of the individual organism, as well as that of the biosphere. As argued by Steven Rose, it is how component cells and organs develop, specialize, communicate and cooperate that largely determines the viability of the whole living organism. Without stressing the parallel too far, his imagery does bear some limited comparison with the modern understanding of democracy as a collective enterprise founded on the creativity, adaptability and capacity for co-operation and specialization of the individual citizens who constitute the indispensable basis of all democratic political organization, however tightly bound together they may also be.

Overall, then, if the social sciences in general, and political science in particular, wish to reaffirm their allegiance to best practices in the modern natural sciences, they could do worse than to open themselves to the non-equilibrium, methodologically pluralist, conceptually innovative, and reality-driven concerns and practices of the contemporary life sciences. As noted by Kauffman, biology is a deeply historical discipline. It may therefore have more to offer to the social sciences than much of the physical sciences, where developmental processes are less crucial. (Perhaps for this reason in the French academic tradition the "science of man" provides an encompassing linkage).

Biological theories and discoveries are also charged with normative significance in much the same way that political findings and explanations carry value implications with them. Disciplinary training in such areas should not be purely technical and instrumental, but need to include the provision of guidance on how to deal with the social meaning of the scientific work to be undertaken. Hence, for example, this paper has advocated methodological pluralism, including training in the historical development of the discipline or disciplines in question. My brief sketch history should at least serve to illustrate the reality that social and political factors have continually interacted with "in-discipline" developments to shape the course of thinking about the life sciences, and more generally the "science of man." Thus, for Darwin anti-slavery underpinned his scientific project; Henderson's excursion into sociology was prompted by anti-

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<sup>21</sup> James Lovelock, *The Ages of Gaia: A Biography of our Living Earth*, Oxford: Oxford University Press, 2<sup>nd</sup> edition, 1995.

bolshevism; Lovelock was galvanised (and indeed employed) by NASA; Dawkins uses his science to dethrone religion; and battles over what science can tell us about “human nature, or what evolution implies for social co-operation, rage around us to this day.

In view of this a professional training in political science that only valued precise causal attribution, quantification, and replicable verification would not equip the next generation of researchers with the plurality of methods required to do justice to their subject matter. Certainly progress in the life sciences has owed a great debt to these methodological virtues, but it has also drawn from many other sources, some of them quite literary, historical and philosophical. If the natural sciences are to be invoked as a model for the social sciences to emulate, my argument has been that modern biology and the life sciences more generally provide a source of inspiration favouring openness, eclecticism, and the deployment of multiple methods. This paper has illustrated its point by eschewing quantification and tight causal claims, and by instead offering a birds-eye survey and a loose interpretative sketch. The underlying claim is that study of the history of thought can also contribute productively to the development of a discipline, and is therefore worth including in the repertoire of skills that should be transmitted to its practitioners.

However, a final caveat is also in order. I have argued biological analogies may help social scientists to reconcile their desire for rigour and the accumulation of objective knowledge with the need to guard against ossified concepts and mechanistic reductionism. But analogy is not homology, and the study of man is not reducible to the life sciences. Political behaviour is shaped by historical and cultural processes that have increasingly superseded the constraints of evolutionary necessity. And human beings in contrast to all other animals rely on speech, and related forms of group interaction to construct a realm of causal understanding social interpretation and imaginative discourse that motivates their behaviour and offers them a margin of freedom to act in accordance with their intentions for outside the constraints derived from their animality.<sup>22</sup> Thus politics and democracy can learn from biology, but without being reduced to it.

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<sup>22</sup> Raymond Tallis, *The Knowing Animal: A Philosophical Enquiry into Knowledge and Truth*, Edinburgh: Edinburgh University Press, 2005.