Fatal asymmetries

The conflicting relationship between political institutions and natural selection

Luis Sánchez, *University of Queensland*

Abstract. **In *Descent of Man*, Charles Darwin noted the impact of political institutions on natural selection. He thought that institutions such as asylums or hospitals may deter natural selection; however, he did not reach a decisive answer. Questions remain as to whether the selective impacts of political institutions, which in Darwin's terms may be referred to as "artificial selection," are compatible with natural selection, and if so, to what extent. This essay argues that currently there appears to be an essential mismatch between nature and political institutions. Unfitted institutions put exogenous and disproportionate pressures on living beings. This creates consequences for what is postulated as the condition of basic equivalence, which allows species and individuals to enjoy similar chances of survival under natural circumstances. Thus, contrary to Darwin's expectations, it is sustained that assumed natural selection is not discouraged but becomes exacerbated by political institutions. In such conditions, selection becomes primarily artificial and perhaps mainly political, with consequences for species' evolutionary future.**

Key words: Natural selection, artificial selection, political institutions, basic equivalence, self-sufficiency, self-restraint, ecological constitution

What would happen in a world dominated by human artificialities? Should we assume that the world would continue evolving through natural selection? Darwin uses the concept of "artificial selection" (Ruse, 1975, p. 340), and although he does not explicitly address this question, his theory contains important implications. In this article, this question is examined from the point of view of political order.

Following Darwin's reasoning, first I will argue the eminent artificiality of political institutions, in discussion with relevant theories such as those of Friedrich von Hayek, Karl Polanyi, John R. Commons, and other thinkers. Second, I will argue the thesis of *basic equivalence* of beings, a condition that arguably regulates the spontaneous coupling of species and individuals in nature. Third, I will argue the selective role of political institutions and the disturbing consequences they may produce on natural selection when they mismatch the conditions of basic equivalence. Accordingly, contrary to Darwin's suggestion that artificial institutions such as asylums and hospitals deter natural selection (Darwin, 1981, pp. 167–168), it is maintained that political institutions affecting basic equivalence do not discourage but indeed intensify selection, perhaps to unnatural levels, as may be evinced by the current situation of human populations and biodiversity around the world.

Let us start by discussing the eminent artificiality of political institutions. This argument may seem obvious, but it is not necessarily so. In fact, in political theory, a possible majority of thinkers attribute to political institutions some kind of natural status, as in the theories of Aristotle, Thomas Aquinas, Thomas Hobbes, or, in general, in the currents of natural law (Hunter, 2011; Shook, 2009, p. 649; Undersrud, 2014). An author who, in more recent times, provides some natural explanation for political institutions is Friedrich von Hayek, whose theory of spontaneous order is worth discussing.

Hayek's spontaneous order

Hayek speaks of an order as

> a state of affairs in which a multiplicity of elements of various kinds are so related to each other that we may learn from our acquaintance with some spatial

doi: 10.1017/pls.2020.27
Correspondence: Luiz Sanchez, University of Queensland–Saint Lucia Campus, School of Law, Forgan Smith Building, Saint Lucia, Queensland, 4072, Australia. Email: *luismsf@hotmail.com*

> or temporal part of the whole to form correct expectations concerning the rest, or at least expectations which have a good chance of proving correct. (1998, p. 36)

Hayek does not distinguish between natural, social, and political orders. Instead, he distinguishes between spontaneous order and "deliberate arrangement," "made," or "artificial" orders (1998, pp. 36–37). Both orders can coexist within societies, but we cannot combine them in any manner we choose. In this division, Hayek notably identifies spontaneous order with markets as well as, in free societies, with "the family, the farm, the plant, the firm, the corporation and the various associations, and all the public institutions including government" (1998, p. 46).

Hayek's spontaneous order is assumed to be evolutionary (Steinmo, 2010, p. 19), and in that sense, it is thought to be nature-like. Is it "natural" in the Darwinian sense? Not so much. Although Hayek provides examples of spontaneous order in nature, such as crystal formations or iron filing arrangements on sheets of paper when magnets are placed underneath (1998, pp. 39–40, 46), he prefers using physics and social models to demonstrate his idea of spontaneous order (which he calls "Kosmos"). According to Hayek, the social ideas of evolution and the spontaneous formation of social orders provided at last "the intellectual tools which Darwin and his contemporaries were able to apply to biological evolution" (1998, p. 23). Hence, Hayek describes spontaneous order as a physics-based—rather than biology-based—social theory. As such, it has been said that his theory fails as an integral theory of nature (Erev, 2019).

Nonetheless, Hayek's model confronts similar problems as those covered by Darwin concerning the conditions of the order, the characteristics of the beings partaking in it, and their rules of interaction. The spontaneous order is a complex interaction between living beings with an infinite range of variability. Is this order composed of similar or hierarchical agents? Is it driven by struggle and competition or by other forces? Hayek is not as explicit as Darwin on these issues. Notably, he suggests spontaneous order is created by individuals who expect some sort of homogeneous behavior from others to ensure that collaboration can occur and to make social life possible:

> If the rule were that any individual should try to kill any other he encountered, or flee as soon as he saw another, the result would clearly be the complete impossibility of an order in which the activities of the individuals were based on collaboration with others. Society can thus exist only if by a process of selection rules have evolved which lead individuals to behave in a manner which makes social life possible. (1998, p. 44)

Hayek implies that the responses of individuals within a given environment need to be "similar" in certain aspects so that actions occur under certain rules or within certain ranges (1998, p. 44). He does not specify the types of rules that individuals must follow to attain similar behavior, but he believes that individuals "will normally prefer a larger return from their efforts to a smaller one, and often that they will increase their efforts in a particular direction if the prospects of return improve" (1998, p. 45). The requirement of similar behavior remains persuasive, although the argument of expected larger returns may be contested, as we will see later.

It might be said that "similarity" is precisely what makes spontaneous order possible. The term "order" implies some sort of parity among multiple agencies, so that none contains enough power to eradicate others. Otherwise, agents with unlimited power could not be counterbalanced, and the order would disintegrate. In this sense, order presupposes some form of either static or dynamic balance.

Sometimes the idea of balance is criticized in abstract terms (Kricher, 2009), but indeed, this condition underlies the search for scientific regularities, and for sure it makes sense in terms of our certainties about the existing world. The idea of balance is not uncommon in natural sciences and political philosophy. Joseph Townsend (1786), for instance, thought that among people, "[s]ome check, some balance is […] absolutely needful, and hunger is the proper balance; hunger, not as directly felt, or feared by the individual for himself, but as foreseen and feared for his immediate offspring" (see also Hume, 1985, pp. 333–344; Suzuki, 1997, pp. 198–199). Balance was the idea that inspired Robert Malthus to postulate struggle as the mechanism that checks and restores population in *Population Principle*, and, in Richard Delisle's opinion, Darwin's theory would be "more about maintaining an evolutionary equilibrium than producing an evolutionary directionality" (Malthus, 1826; Delisle, 2019, p. 26).

Balance is also an idea underlying Hayek's concept of order, which he borrows from anthropological studies. He notes, "As has been said by a distinguished social

https://doi.org/10.1017/pls.2020.27 Published online by Cambridge University Press

anthropologist, 'that there is some order, consistency, and constancy in social life, is obvious. If there were not, none of us would be able to go about our affairs or satisfy our most elementary needs'" (1998, p. 36). Order certainly implies a form of "consistency" and "constancy"—that is, some sort of *balance* in social life. Hayek notes that in spontaneous order, every element and factor operates "adjusting all its various actions to each other" (1998, p. 51). He further observes that "if some of the actions are determined by another agency on the basis of different knowledge and in the service of different ends [...] a balance.... will be destroyed" (1998, p. 51).

Obviously, mutual adjustment and subsequent equilibrium, whether static or dynamic, are only possible when the elements reach a certain parity, each one enjoying a similar adaptive condition (Cuddington, 2001). Otherwise, predatory carnage rather than mutual adjustment would ensue. In this event, the inferior would submit to the most powerful until the ecosystem was destroyed. Without "similarity," there would be no balance, and without balance, there would be no sustainability or order at all.

In this sense, in view of the coexistence of life forms within our cosmic era, we may assume that balance is a condition resulting spontaneously from natural adaptations. Perhaps this concept cannot describe in great detail all events that occur in nature, but it still provides a realistic account of one of the most important properties observed in the ecological world, the mutual coexistence of beings at least roughly maintained until now.

Accordingly, Hayek is essentially correct when he suggests that although it is not difficult to destroy spontaneous formations, it may be beyond our capacity to deliberately reconstruct them (1948, p. 25). This is crucial in an ecological context. When, because of some causes—for instance, the predatory pressures on biodiversity—balance is disrupted, mutual adjustment and the recovery of balance may take a long time or even become impossible. Hayek attributes this to human orders, but his assertion becomes more compelling in ecological circumstances, particularly considering the extended impact of human contrivances on the spontaneous orders in nature.

Nevertheless, the theory of expected greatest return that Hayek endorses and ascribes to the order's agents is less convincing. Whether this is true of all people and individuals, as the economic theory of rational choice assumes, regardless of the agent's culture and the institutional contexts, is subject to debate. However, it would be weird to predicate it of all species, not even of animals. In general, animals fulfil their needs with whatever they scavenge or hunt. Either their needs are immediately fulfilled, or dissatisfaction compels them to confront challenges to access what they require. In any case, they rarely progress beyond their immediate and finite demands, even when some, such as ants or squirrels, manage to store items for a later date.

This portrays what might be called the two basic traits of the behavior of nonhuman agents: *self-sufficiency* and *self-restraint*. Self-sufficiency allows agents to survive by their own means; self-restraint marks the limit of what they do not need, and they are not compelled to consume, whereby it remains available to others. Therefore, the rule of expected greatest return is not generalizable to all ecological agents.

Another naturalistic fallacy?

Hayek's distinction between "spontaneous" and "made" orders (1998, p. 37) is convincing, but he is not so when he attributes to human society the condition of spontaneous order (1998, p. 62). He imputes similarity and balance to human societies, which is curious, considering that neither societies nor markets display such properties under real circumstances. As a matter of fact, social inequalities, poverty, crime, violence, and other eventually unmanageable disturbances characterize human societies up to extreme levels. Hayek's idea of similarity may be applicable to describe the agent's condition in natural orders rather than in actual societies. Therefore, Hayek's theory involves treating society as a mere extension of nature, which neglects the distinctive quality of human consciousness and the disproportionate weight of man-made inventions throughout human history. Even if we accept Hayek's well-known argument that society cannot respond to a central planner, societies are far from being the result of spontaneous circumstances in which the shared purposes of individuals, groups, or governments play no role.

Hayek proposes to equate social institutions and markets with spontaneous orders, which implies naturalizing society and attempting to pass the artificial as natural. This might be another case of naturalistic fallacy, analogous to that pointed out by George Edward Moore, who criticized attempts to attribute to certain ideal notions, such as the notion of "good," a natural existence, which in his opinion was indemonstrable (Moore, 1971, pp. 38–39). Likewise, Hayek seems to attribute the conditions of nature to the artificial

https://doi.org/10.1017/pls.2020.27 Published online by Cambridge University Press

institutions of society. To attain such assimilation, he denies the predominance of purposes in societies. He claims that purposes operate only at an individual level (1998, p. 39), and thus social agents would not have a genuine collective goal.

This argument seems to underestimate the distinctive quality of human intentionality, of which the world of constructed artifices is overwhelming proof. It neglects the 20,000-year history of purposeful building of human societies. Social orders are inescapably framed by human intelligence, or by *human consciousness*, which is inherently self-oriented toward ends that derive from needs, ideas, feelings, rules, institutions, and environmental conditions. In this sense, social order, and its assumed evolution, is made by humans for humans, whether individually or collectively, rather than being an inescapable result of spontaneous circumstances.

Hayek's assumptions about the spontaneous origin of market societies are contradicted by Karl Polanyi's revision of England's history. Polanyi argues that the market economy resulted mainly from deliberate purpose rather than natural tendencies. Examples include artificial interventions of governments' policies, industrialist's purposes, and thinkers' elaborations. According to Polanyi, "while *laissez-faire* economy was the product of deliberate state action, and subsequent restrictions on *laissez-faire* started in a spontaneous way" (2001, p. 147). Markets progressed through the conscious intervention of political agencies, while the setting of market restrictions emerged spontaneously from unplanned uprisings when the political expansion of markets risked social well-being.

The period of successive interventions that institutionalized the market economy in England fell between the introduction of the Speenhamland Law on May 6, 1795, and the Poor Law Amendment of 1834. The amendment introduced "independent workers" and "the unemployed" as new categories, Polanyi says (2001, p. 232). In this way, the government completed the task of creating labor markets and converted the labor force into another commodity.

The formidable intellectual contributions of classical economists in favor of the expansion and consolidation of the new—"self-regulated" economic order, as Polanyi calls it—should also be considered. Townsend, Malthus, and David Ricardo "erected upon the flimsy foundation of Poor Law conditions the edifice of classical economics, the most formidable conceptual instrument of destruction ever directed against an outworn order" (Polanyi, 2001, p. 31).

Polanyi sustains that the new expanding economy—later named "free market"—results essentially from three artificialities: the land market, the labor market, and the money market (2001, pp. 76–77), ultimately conditioned by other artificialities, such as the invention of machines. The conscious expansion of the artificial economy not only has economic purpose but attempts to conquer the whole of society. Therefore, "Instead of economy being embedded in social relations," social relations become "embedded in the economic system" (2001, pp. 76–77). This leads Polanyi to suggest that contemporary societies stem from a "great transformation" in which traditional societies succumb to the artificialities of a market economy increasingly supported by the government.

In other words, the "great transformation" purports somehow the final dethronement of any spontaneous tendencies still present in traditional societies, the overdimensioning of some artificialities, and the passage into an era in which the lifeworld—as Jürgen Habermas would say—tends to be colonized by the economic sphere. Social rationality, consistently supported by institutions, rules, and public policies, is pushed into a unidirectional course that ultimately conflicts with ecological restrictions.

In terms of balance, Polanyi's thesis seems to be more convincing for explaining contemporary political orders derived from the conscious and complex interventions of public and private agents, rather than emerging from merely spontaneous economic or purposeless political processes. States, governments, plans, rules, policies, science, technological innovations, engineering, education, and all institutions so far invented frame the path of assumed social and economic evolution. With artificialities now at the center, there is very little that may be recognized as spontaneous order in modern history. This certainly does not imply that history is following wrong courses in all extremes.

The inevitable intermediation of political artificiality

Allegedly Polanyi's thesis converges with institutionalist approaches maintaining that institutions constrain behaviors in every social activity (Béland, 2017, p. 29; Hodgson, 2006; Sauerland, 2015, p. 561; Schmidt, 2011). Further, political institutions are obviously artificial, as they are designed, established, and otherwise

https://doi.org/10.1017/pls.2020.27 Published online by Cambridge University Press

selected by human agency. They perform outcomes that may be natural in their materiality but artificial in their purposes and design, mainly linked to the introduction, distribution, allocation, use, and disposal of human goods and charges. Then we might say that the crucial interaction between artificialities and natural circumstances, and the selective results that it produces, results from social choice framed in the spheres of organizations, markets, administrative systems, laws, bargaining, and other institutions (Dryzek, 1987, pp. 7, 67), lastly framed by the political society.

It is worth remembering that artificial selection linked to political institutions, in comparison with the theory of natural selection, has been already examined in social theory. For example, Lester Ward considered human progress, laws, and institutions to be as artificial as machines (1911, p. 662). Following Darwin's ideas, Ward accepted the difference between the natural and the artificial and suggested that the latter marks the distinction between man and other animals:

> It is natural selection that has created intellect; it is natural selection that has developed it to its present condition, and it is intellect as a product of natural selection that has guided man up to his present position. The principle of artificial selection which he has been taught by nature, and has applied to other creatures. (1911, p. 15)

Ward also spoke of the artificial progress associated with the idea of a "teleological process" identified by "a conscious effort on the part of society to bring about an improved social state foreseen and planned by society" (1911, p. 485). Ward's dynamic sociology is conspicuously concerned with the idea of progress.

Max Weber spoke of social selection in contrast to biological selection and suggested that the former does not always occur through struggle. Social selection means that certain types of behavior and personal qualities are more likely to enter certain social relationships—for instance, as lover, husband, deputy, official, construction contractor, general manager, or employer (Weber, 1964, pp. 31–32). Social selection also applies to the free recruitment of labor, which can be limited via serfdom (1964, pp. 100–101).

In a way, Weber's *Economy and Society* might be read as a comprehensive study of different methods of selection, including the selection of workers, chiefs, bureaucrats, parties, politicians, leaders, or congressmen, either by means of democratic, plebiscitary, hierarchical, hierocratic (domination), or other institutionalized methods. Weber suggests that existing political institutions, whether traditional, aristocratic, or juridical, mostly select people. Still, he remains silent, possibly opposed to Darwin's theory (Breiner, 2004).

John R. Commons was certainly more explicit. Apart from postulating that natural selection is a misnomer and that "'selection,' properly speaking, involves intention, and belongs to human reason," he referred to this selection as "artificial" (Commons, 1997, p. 44,). Commons concluded that biological facts underlie human society, but new factors are created by self-consciousness. This turns biological evolution into social evolution and makes it possible to speak of "social selection." Therefore, Commons had no difficulty in postulating the artificial nature of institutions and of the selective tasks they may perform.

One such institution is education. In some cases, educational institutions can cause human degeneration. "They [human degenerates] are strictly biological only when they are congenital and therefore not educable. They are social degenerates when they are the product of a degraded education" (Commons, 1897, p. 88). Another instance is property. Commons explained property as a case of artificial selection applied to man, through which social institutions develop "towards a state of equal rights and opportunities for all" (1897, p. 87). The institution of property is a base for expanding rights. Artificial selection also operates through statutes. According to Commons, "As society becomes more definite, reflective, and humane, as it acquires fixed laws and government, it increases the range of artificial selection; it supplants custom by statute and remodels its inherited institutions" (1897, p. 91).

Commons considered artificial selection to be indirect social selection. He warned that this type of selection could influence personality by either suppressing or developing it and by adjusting the political, industrial, and social environment using rights and education as instruments. Commons noted that "the tenement-house congestion, with its significant educational environment, is the product of laws of property and taxation which favor owners and speculators instead of tenants, and of private property in rapid transit which puts a tax on exit to the suburbs" (1897, pp. 91–92).

Artificial selection does not necessarily produce equivalent results as those of natural selection. To be sure, Commons was aware of the possible dangers of unbridled artificial selection, whether direct or indirect, for the welfare of people. This can lead to self-development but can also be self-destructive. Yet he

https://doi.org/10.1017/pls.2020.27 Published online by Cambridge University Press

was optimistic that, in current societies, artificial selection was advancing to a higher level where there would be more space for freedom, security, and equal opportunities. These important ideas are condensed in the following paragraph:

> It cannot be said of this and other selective factors, such as the profit-making saloon, long hours of work, low pay, irregular employment, that they permit natural selection to operate. They suppress personality, which preeminently is the natural fact in the human being. Social selection is therefore tending to become less and less arbitrary but is making room for a higher natural selection-a natural selection where not brute force and cunning are the fittest to survive, but where, with freedom, security, and equal opportunity, the human personality will work out its own survival. Man alone of all the animals can rise to the angels, but he alone can fall below the brutes. This is the glory and the penalty of personality. It becomes a unique selective agency whose standard is raised with the advance of civilization. The Australian cannibal, without opium, tobacco, alcohol, or syphilis, may survive with a low morality. The American exposed to these destroyers must be a better man or perish. Personality, thus becoming a keen selective principle, is based not necessarily on overpopulation and competition, but on that self-destruction, which comes from vice, disease, and drunkenness. (Commons, 1897, p. 92)

In *Legal Foundations of Capitalism* (1924), Commons returned to the artificial character of institutions and explains its scope: "*All* of the phenomena of the human will are, in this sense, 'artificial,' in contrast with phenomena which may be distinguished as 'natural.'" Yet "artificial" is not absolutely or certainly unnatural, but "is the highly 'natural' process of the human will, picking out the limiting factors of nature and human nature in order to guide certain complementary factors into the direction desired by human purpose." The history of artificial selection "is the evolution of the automobile or the thoroughbred horse, not the evolution of the universe or the tiger; the evolution of governments, business organizations, the banking system, the family contract, not the evolution of colonies of bees or herds of animals" (Commons, 1924, pp. 375–376).

Apart from Ward, Weber, and Polanyi, Commons's theory clearly contrasts with Hayek's. While Hayek assumes that societies resulted from a spontaneous order, although not a biological one, Commons maintains that institutions resulted from a consciously self-directed artificial selection. Institutions are selected and, in turn, they select their outcomes. Whether this selection leads necessarily to improvement or toward evolution, as in Commons's optimistic view, is a different issue. It cannot be denied that humans have the potential for infinite improvement, though. Sometimes, the outcomes of human action couple well with nature; sometimes they do not. Although some degree of institutional progress is verifiable, Commons's optimism for the future might be contradicted by the disruptive consequences of human interventions on natural components observed in present circumstances.

In any case, Commons's conviction about the artificiality of institutions cannot be contested. Societies set the rules allowing the hunting of certain animals as well as seasonal fishing, and the farming of cows, pigs, or chickens at industrial levels. Agriculture is promoted for some species over others along with the cloning and spreading of transgenic varieties, DNA engineering, and fertility markets. Such artificial practices may be necessary for human existence, but we should not ignore the selective consequences they entail.

The argument constructed by Commons suggests that institutions organizing the patterns of government serve as intermediates in the artificial selection associated with access to social goods such as employment, wages, education, health, technologies, and property, as well as to the distribution of charges, taxes, and penalties. Certainly, the problem is not the increased artificial selection but the way in which political institutions frame the selection, and the disruptive outcomes they may produce.

Let us turn now to the second strand of argument, the probable impact of artificial political institutions over assumed natural selection.

The natural order according to Darwin

Darwin's natural order evolves through natural selection and centers on competition and struggle for survival. So far, the significance of natural selection in biological terms has been the subject of much debate, and many of Darwin's concepts have been contested (Delisle, 2019, p. 261). The apparent consensus is that evolution is caused by complex tendencies, among which authors include drift, migration, gene flow (Fodor & Piattelli-Palmarini,

https://doi.org/10.1017/pls.2020.27 Published online by Cambridge University Press

2010, p. 6), hereditary symbiosis (Sapp, 2016), random survival (Gould, 2002, pp. 144, 244), and epigenetic influence, among other factors (Beattie, 2017; Meloni, 2014, p. 601; Steele et al., 1998). In addition, Darwin's *artificial selection,* or Peter Kropotkin's *mutual aid*, may also be considered distinct evolutionary forces.

Darwinian and neo-Darwinian theories emphasize the *mechanism* of selection, whether struggle or competition, and they are less focused on the conditions in which agents, whether genes, individuals, or populations, partake in the competitive selection. Do they have differentiated endowments? Are species, individuals, or groups distributed in hierarchical positions? Do any hold a privileged status in the selection?

Undoubtedly, assuming hierarchies in the evolutionary process essentially contradicts Darwin's view. Darwin was interested in supporting two things: first, that there is no predesign or predestination in the natural world; second, that species, including humans, derive their existence from each other and share common ancestors (Darwin, 1981, pp. 152–153). The idea of natural selection did not lead Darwin to postulate that selection governs itself by rules of hierarchy or privilege. Also, humans participate in such spontaneous nature in the same condition, ancestrally linked to other species. There are no chasms between humans and nonhumans, but rather continuities, entanglements, and enduring associations (Delisle, 2019, p. 20; Diehm, 2014). Far from the biased individualism of socio-Darwinian interpretations, Darwin's view allows us to recognize the mutual connections between beings. In *The Origin of Species*, for example, he notes the surprising relationship between the presence of felines and the frequency of certain flowers in a district (Darwin, 1909, p. 88). He thought of natural selection as an insurmountable interdependence among beings:

> I should premise that I use this term [struggle for existence] in a large and metaphorical sense including dependence of one being on another…Two canine animals, in a time of dearth, may be truly said to struggle with each other which shall get food and live. But a plant on the edge of a desert is said to struggle for life against the drought, though more properly it should be said to be dependent on the moisture. (Darwin, 1909, p. 78)

Then he adds, "It is good thus to try in imagination to give to any one species an advantage over another. Probably in no single instance should we know what to do. This ought to convince us of our ignorance on the mutual relations of all organic beings" (Darwin, 1909, pp. 91–92). In another suggestive passage, Darwin remarks, "Let it also be borne in mind how infinitely complex and closefitting are the mutual relations of all organic beings to each other and to their physical conditions of life" (1909, p. 93). Later in the text, Darwin states,

> Thus, I can understand how a flower and a bee might slowly become, either simultaneously or one after the other, modified and adapted to each other in the most perfect manner, by the continued preservation of all the individuals which presented slight deviations of structure mutually favourable to each other. (1909, p. 109)

Clearly Darwin's picture of natural selection is about a self-organized order of species in mutual interdependence. His view converges with current ecological perspectives leading to the abandonment of a human-centered world in biological terms (Bookchin, 1982; Bowler, 2013, p. 149; Dryzek, 1987, pp. 26–28; Naess, 2005, pp. 343–347; Krause, 2016; Shrader-Frechette, 2008; Steffes, 2013, p. 392). Species interact and evolve simultaneously in an open world that, as such, it is not predetermined to favor any of them and does not deliver an evolutionary future written in advance. Darwin exposes a nonteleological vision of general evolution (Ariew, 2008; Ghiselin, 2005).

This certainly implies some degree of horizontality among beings, whereby, as said before, in this aspect Darwin's view does not conflict Hayek's idea of "homogeneous behavior." This does not imply linear equality either. What Darwin implies is that all agents valuate on their own. They weigh the same in the web of nature and count by themselves on their own potential. Therefore, it is impossible to say that some species, or individuals, are worth more than others. They exist in mutual dependence and continuous exchange with the surrounding components.

Even if a static balance was excluded (Kricher, 2009), it is not unfounded to imagine a natural order of spontaneous assemblage, self-performed through the dynamic renewal and change of intergenerational species, which functions with no rigid equality, privilege, or strict domination among its components. Such is the "romantic" picture of ecological order that emerges from Darwin's writings (Richards, 1999). However, even if considered "romantic," there is no doubt that

https://doi.org/10.1017/pls.2020.27 Published online by Cambridge University Press

mutually balancing interactions are regularly observable under natural circumstances.

A theory of mutual equivalence

Horizontality in beings' existence is precisely what inspires the postulation of the concept of *basic equivalence* to describe the basic condition of species and individuals within the ecological world. Plausibly, this is a factual and universal condition that may be evidenced in the real world to the extent that, under natural circumstances, individuals and species share at least two given properties. First, they share *life*; that is, they enjoy the condition of *being alive,* with all advantages and disadvantages that this entails. Second, they are intrinsically connected to an environment that accommodates to their needs, excluding contingent factors such as accidents, disasters, or unanticipated external circumstances that may unexpectedly frustrate their chances.

Under these conditions, it is reasonable to consider that the environment is neutral for all beings inasmuch as it does not pursue any predetermined selective purpose. In principle, it is available for all species and individuals; thus, the future remains open to everyone. If any selection occurs in such circumstances, it may be described as *neutral*. Whether the selection occurs exclusively through competition, as conventional Darwinism assumes, by cooperation, as Wallace's and Kropotkin's interpretations suggest, (Wallace, 1870, pp. 265–267) or by any other mechanism, it is ultimately unbiased. It is not predesigned, nor does it operate a priori in favor or against any species or individuals. In these conditions, basic equivalence prevails. It is only destroyed when unexpected factors intrude disproportionately on casual exchanges. When this happens, beings confront anomalous situations that may lead to rearrangements or frustrate their spontaneous existence, continuity, and evolution.

We might say, then, that basic equivalence does not contradict but rather shares Darwin's awareness of interconnectedness and shares Hayek's assumptions about similarity in spontaneous orders, besides being compatible with current ecological views. However, important nuances may be detached, particularly regarding Hayek's theory.

Hayek's order is composed of individuals. He suggests that "true individualism is the only theory which can claim to make the formation of spontaneous social products intelligible." Then he adds that "if left free, men will often achieve more than individual human reason could design or foresee" (1948, pp. 10–11). In other words, spontaneous order arises from interactions between individuals and from anything rather than reason. Reason does not communicate a great deal to individuals about their collective ends as "the spontaneous collaboration of free men often creates things which are greater than their individual minds can ever fully comprehend" (1948, p. 7). This assertion is somewhat puzzling, insofar as the path from individuals to institutions is left in limbo. As Chandran Kukathas says, it is "obscure" how institutions such as the family, the farm, the plant, the firm, the corporation, the various associations or the government, can arise spontaneously from individuals, without the intervention of shared reason (1989, p. 104).

Hayek calls the spontaneous order "Kosmos," in contrast to "Taxi," which alludes to "made" orders. In "Kosmos," relations among individuals can only be described as "abstract." Hayek notes that "its degree of complexity is not limited to what a human mind can master. Its existence need not manifest itself to our senses but may be based on purely abstract relations which we can only mentally reconstruct" (1998, p. 38). In this sense, the agents of Hayek's spontaneous order perform *functions* rather than *purposes* (1998, p. 39), and the passage from individualism to institutions, as said before, remains mysterious.

Hayek's individuals within "Kosmos" inevitably remind us of social Darwinism's picture containing only individuals under spontaneous interaction; however, in Hayek's spontaneous order, collaboration between free men, rather than competition, is expected. Nonetheless, in other works, Hayek also speaks of "competitive order" as the system that "we want" in order to make "competition work" (1948, p. 111). As such, the commonalities between Hayek's theories and social Darwinism cannot be understated, although, surprisingly enough, he reproaches social Darwinists for focusing on the selection of individuals rather than that of institutions (1998, p. 23).

Hayek claims not to be a Darwinist, but he participates in evolutionary ideas, using at least the Darwinian term "selection" to speak of cultural evolution. He maintains that there are "important differences" between selection in cultural evolution and the selection of innate biological characteristics (1998, p. 23), but ultimately he participates in the same philosophical tradition as Darwin and assumes evolutionary ideas (Dopfer, 2001; Marciano, 2009).

https://doi.org/10.1017/pls.2020.27 Published online by Cambridge University Press

Overall, Hayek's spontaneous order renders, in political terms, a version of negative liberalism that restricts government control over societies and locates markets and free competition at the center (Butler, 1983, pp. 78ff.: Kukathas, 1989, p. 94). Therefore, his position detaches competition in Darwin's sense but diverges from Darwin's insights on ecological interactions. A vision that places competition as "the" mechanism that forges natural or social orders arguably does not reflect the extraordinary web of connections in the natural world, including kinship, insect colonies, mammalian groupings, symbiotic associations, collective strategies, and infinite exchanges within niches and entire ecosystems. Not to mention communities and states consciously organized by people for common purposes.

In this web of complex interactions, beings can find infinite ways to live and prosper as individuals or groups despite their differences, singularities, failures, or defeats, as much as the condition of basic equivalence reproduces among the exchanges. Species and individuals are, in principle, naturally capable of surviving on their own. They possess specific powers that allow them to pursue their individual needs, coexist with others, and take what they need from their environment to live and reproduce, leaving the remaining resources for others. In this sense, basic equivalence defines the threshold of self-sufficiency and self-restraint under which free and multiple interactions occur, and species and individuals have the same approximate chances for survival. Self-sufficiency and self-restraint favor competition but also cooperation and other conducts for living, collectively displayed and self-regulated. A world in which some agents are hopelessly weak and finite while others are intrinsically superior and invincible would be unsustainable and unimaginable.

Accordingly, it is plausible to consider the notion of basic equivalence as appropriate to describe at least three universal features of beings, given in natural conditions:

1. All agents are endowed with similar basic equipment that allows them to achieve a successful existence, leaving aside qualitative differences among species, the randomness of secondary physical differences, and accidental disabilities.
2. In a world of ecological interconnectedness, all agents and factors count for and contribute to the building, reproduction, and maintenance of their immediate environment, as well as the entire ecological order. By that measure, the environment is equally available for all.
3. To the extent that agents take from nature only what they require to live and reproduce, their behavior is proportional and self-restricted in terms of their consumption. No one attempts to destroy others for the sake of destruction, disregarding, by now, the eccentricities of human intelligence. In this manner, self-sufficiency and self-restraint naturally perform.

All species and individuals may be seen partaking of such characteristics in similar amounts. Therefore, they are equal in ecological terms. It happens as though all species had the same physical power, although power certainly differs among species and cannot be measured using the same scale. A tiger certainly does not suit the environment better than a cow in terms of its chances for survival. Neither does a cow fit better than a cat, nor a cat better than a rabbit, or a rabbit more than the carrots, herbs, and grains that it survives on. Under ecological circumstances, no species or individuals can claim itself best adapted—superior or inferior—as all depend on the chain of energy exchanges that makes existence of all possible.

On the other hand, because species evolve within an environment, it provides them all their requirements making self-sufficiency possible. The environment offers species and individuals similar opportunities to access goods, except when uncontrollable natural catastrophes or unexpected changes occur. At the same time, as no agent has unlimited needs, invincible powers, or uncontrollable ambition, self-restraint becomes the spontaneous rule. If one species exceeds others, whatever the cause, others gradually counterbalance it.

It might be imagined that the ecological world functions as having a political regime in which every agent shares the same power, enjoys the same chances to pursue their needs, and confronts the same threats. This may be true, at the very least, during the long periods of stability that cosmic circumstances provide. In these conditions, the order can be assumed to be in equilibrium, and when abrupt imbalances happen, resilience can be expected. If any selection occurs under such conditions, it could not be biased, as far as all agents weigh the same and have similar chances for survival, within a world open to multiple possibilities. Things happen in nature as if there were an ecological constitution spontaneously governing with rules that may be considered approximately democratic.

https://doi.org/10.1017/pls.2020.27 Published online by Cambridge University Press

Is natural selection democratic?

The argument of basic equivalence leads us to think about Jean-Paul Gagnon's theory of evolutionary basic democracy (EBD). Gagnon argues that "democracy seems to have certain biological or evolutionary qualities" (2013, p. 6) and that it simply began with the dawn of life. "Two billion years ago unicellular life forms were in the habit of cooperating, competing and communicating with kin and other species" (Gagnon, 2013, pp. 35–36).

The EBD model applies to all physical particles, including amino acids, microbes, sperm, and certainly individuals. "[P]hysicists understand democracy as a place where agents are made equal," Gagnon argues, supporting the idea that "the natural world, with all of its forces and particles together, make things happen in a big cooperative way" (2013, pp. 37–38). Gagnon proposes that *basic democracy* is a natural tendency in which equal participation for all existing elements is real, instead of being a mere normative posture. Primitive democracy connotes egalitarianism, equality, and capaciousness. It works for both human and nonhumans. We should expect, then—according to EBD theory—that the social world should evolve to become more democratically balanced, while equality and cooperative structures will constantly expand.

Accordingly, EBD presupposes some forms of ecological equality, but for sure, ecological equality does not equate with mathematical identity. Equality cannot be considered completely uniform or a unique and invariable property, as it cannot be measured for all species using one exclusive parameter, as some academic thinking seems to assume. This peculiar concept is implied, for instance, by the stringent requirements of homogeneity theorized by Albert Somit, directed against democratic egalitarian expectations:

> [T]he dubious premises of the democratic doctrine: the belief that men and women are approximately equal…flies in the face of both of our intuitive wisdom and of a massive body of evidence documenting the vast differences in knowledge, skill, and "intelligence" from one person to another. (Somit, 1991, p. 33)

Certainly, no one can claim to be bodily or genetically equal to someone else. There is no way to compare a person to a cat or dog, despite them being considered man's closest friends. However, perhaps the saying "the sun shines on everyone" should be taken seriously. Facing interconnectedness and nature's goods and ills, all beings count, more or less, equally. Everyone has a place to live alongside access to natural assets and restrictions. Under these conditions, the basic equivalence of species and individuals reproduces. In political terms, the condition for exercising equal or proportional rights occurs naturally (Low & Gleeson, 1998, p. 156), and, as Gagnon suggests, we can think of a democracy spontaneously occurring under natural circumstances.

Basic equivalence does not prevent species from meeting their needs and desires by capturing and preying on each other using violent methods. What matters is that mutual exchanges and irrepressible aggressions do not destroy the basic ecological conditions. All beings may succeed in accessing their goods or may suffer proportional violence from other agents and ecological components. Whether physical or emotional, necessities set the limit of self-restriction. Because of the reality that no individual or group has infinite needs, no one seeks to destroy, extinguish, or colonize others. Thus, coexistence becomes possible.

As imperfect as it may be, the concept of basic equivalence seems appropriate to express one of the evident commonalities between all living beings. It provides a realistic ground for rethinking equality under ecological circumstances in more reasonable terms, avoiding the speculative attempts to find a uniform, abstract, or purely rational parameter or to appeal to the analogies of mathematical identity. The concept of basic equivalence could be defended as a "Goldilocks solution," which, as Stephen Jay Gould notes, avoids endless rational controversies over equality and assumes a "blessedly practical kind of approach that permits contentious and self-serving human beings (God love us) to break intellectual bread together in pursuit of common goals rather than personal triumph" (Gould, 2002, p. 7).

Basic equivalence might be considered more egalitarian among humans if the ideas put forward by Roger Masters' discussion of Richard Dawkin's evolutionary theory are considered. Masters states, "If the phenotype is merely the 'vehicle' by which genes replicate themselves . . . human beings are equal in a more profound sense than would appear from the conventional view of civil rights" (Masters, 1990, pp. 195–210). However, basic equivalence does not require any isomorphic properties, at any level, for individuals or groups to be recognized as equals. Basic equivalence only describes equality under ecological circumstances. It is not equality in biological configuration or before the law, but

https://doi.org/10.1017/pls.2020.27 Published online by Cambridge University Press

equality before the goods and restrictions of the living order, within the wide range of natural constitutive differences.

As stated earlier, basic equivalence holds in conditions of reciprocal aggression to the extent that species and individuals take what they require from nature and leave the rest for others, at least while the stock of natural resources remains available. If resources become scarce, mutual adjustment rearranges survivors within an open environment that does not hierarchize, favor, or condemn any species or individuals beforehand. It happens as though the assumed selection takes place among beings with equal needs, equal motivations, and equal power, despite how extraordinarily different species and individuals may be.

Therefore, the natural order may be thought to be constantly promoting the leveling of beings in a broad sense. Nature resembles a horizontal arrangement in which species and individuals enjoy reciprocal advantages and suffer homologous damages. None of them enjoy a privileged status. Each of them may be simultaneously superior and inferior. If such horizontality did not exist under spontaneous conditions, and there were invincible hierarchies instead, some beings would inevitably destroy others, gradually creating homogenization, unsustainability, and early extinction.

In this context, competition, aggression, cooperation, altruism, and prudential and other behaviors take place, including factors of randomness and luck. Organisms are naturally equipped to act in infinite ways according to their specific internal demands and the specific external circumstances they confront. Contrary to the idea of a generalized individualism and permanent struggle, behaviors based on reciprocity and an instinctive predisposition to avoid danger might be more generalized. Biologist Theodor Dobzhansky referred to this in 1967, when he stated that "pugnacity and aggressiveness are often less conducive to biological success than is inclination to "live and let live" and to cooperate with other individuals of the same and of other species" (p. 113).

Living beings may behave in a wide array of manners, ranging from the most selfish to the most collaborative ones, including wasteful, indifferent, negligent, and suicidal attitudes. As Masters suggests, "our behaviour can be both innate and acquired; both selfish and cooperative; both similar to that of other species and uniquely human" (Degler, 1991, p. 327). Each propensity appears to operate differently in agents and can be measured in different circumstances. Overall, basic equivalence maintains and reproduces among the tensions of multiple driving forces.

If species or individuals were uneven at all ends and ruled by exclusive selfishness, without counterbalances from other propensities, or from other agents or factors, depredation would be the inescapable consequence. The most advantaged would extinguish the most defenseless and the number of beings would constantly reduce, making coexistence impossible. This certainly is one of Kropotkin's arguments against social Darwinians' views the regard nature as a fierce slaughter, absolutizing the struggle as a mechanism of selection. Kropotkin notes,

> [W]hen animals have to struggle against scarcity of food, in consequence of one of the abovementioned causes, the whole of that portion of the species which is affected by the calamity, comes out of the ordeal so much impoverished in vigour and health, that no progressive evolution of the species can be based upon such periods of keen competition. (Kropotkin, 1972, p. 3)

The obvious exception to this account is humans, whose aspirations, under certain cultural contexts, may become unrestrained. Doubtless large-scale inequalities, fierce struggles, and disequilibrium are mostly linked to human dominance. However, there are convincing reasons to believe that such disruptive conduct has not ruled the entire history of humankind. If uncontrolled predatory conduct had prevailed along with human presence, coexistence in the natural world would have been interrupted long ago.

The crucial role of political institutions

The grave situation of human populations and biodiversity in the current world seems to be a clear indication that the conditions of basic equivalence, as considered in the preceding section, have been largely disrupted. There is no need to recap the data about the enormous imbalances in biodiversity and within human populations accumulated (United Nations, 2019; UNDESA, 2020). The question is about the role of political institutions in those imbalances.

We might think that the outcomes of human political institutions, in comparison with spontaneous circumstances, are rather disappointing. Instead of promoting self-sufficiency, self-restraint, collaboration, and complementarities, political institutions regularly establish disproportionate and immovable hierarchies among beings. They incentivize unlimited propensities and exacerbate extreme competition, concentration, and

https://doi.org/10.1017/pls.2020.27 Published online by Cambridge University Press

overconsumption of natural assets. Furthermore, they produce unmanageable inequalities. In this way they ultimately destroy the conditions of basic equivalence, equilibrium, and natural resilience.

This critical impact of artificial institutions may be obscured by the inevitable limitations of language or by the practice of using political language in naturalistic ways—for instance, by the biopolitical habits of speaking of dominance, hierarchies, and ensuing inequalities, in a very broad sense, with no difference indicated between human and nonhumans, and denoting that they are biologically conditioned at all extremes (Bejan, 2020; Buston & Cant, 2006; Franck and Ribowksi, 1993; Somit & Peterson, 1997, pp. 52–53). Arguably, the same linguistic habits were present in socio-Darwinian assumptions. While the influence of biological factors and the commonalities between human and nonhumans cannot be denied, we should beware of using a biologically determinist language, as well as any anthropocentric blindness that prevents us from seeing the substantive differences between human and nonhumans, particularly at the level of associations and political societies.

Speaking of "hierarchy," "competition," "inequalities," "struggle," and other behavior in the natural world may be considered metaphorical, as the differences between human political artificialities and animal traits may be radical. For example, dominant roles in baboon groups or chicken flocks cannot be easily compared to human hierarchies, whether political, economic or social, that are regularly structured, set by posited norms, oversized, unlimited, petrified, and often exploitative. Masters notes such relevant differences when he maintains that the centralized state of government is one of the main differences between humans and nonhuman primates alongside "the resulting degree of social differentiation [that] is not like anything observed in a nonhuman primate" (1991, p. 230).

I think the concept of *hierarchy*, as that of *inequality*, strictly speaking, incorporates more of human political invention than a natural propensity, and the existing difference relies upon political institutions. Therefore, if there are crucial asymmetries between the human world and natural circumstances in terms of selective outcomes, the framing of artificial political institutions cannot be neglected.

Nevertheless, this does not mean that political artificialities are essentially wrong, as they are inevitably tied to human consciousness. Neither does this imply that asymmetries are intolerable at all extremes, except when they become severe and unresilient—when asymmetries entail direct or unintended consequences whether for the survival of significant groups, for the stability of ecosystems, or for the entire condition of the ecological world.

This provides us better grounds to answer the crucial question that lies behind Darwin's distinction between *natural* and *artificial selection*—by the way a distinction that is neither precarious nor capricious as some abstract conceptual reductionists may argue (Bensaude-Vincent & Newman, 2007; Trevors & Saier, 2010). Certainly, this is a commonsense distinction that allows people to distinguish what humans find in nature from what they manufacture with their inventiveness.

Based on such distinctions, we have argued that the compatibility between *natural* and *artificial* cannot be taken for granted in current circumstances. This discordance appears to be at the center of the current global mess in which some populations grow exorbitantly, others disappear, and others, for instance, unpredictable viruses, emerge with lethal consequences for humans. Thus, if there is any selection occurring among species, this seems to be essentially *artificial,* or due to artificial circumstances, rather than being plainly *natural*. Indeed, it portrays a sort of political selection in which political institutions are ultimately setting the selective conditions for living beings' survival. How valid is it to speak of *natural selection* in such circumstances?

The risks of a metaphor

It is worth remembering that it was not only Herbert Spencer and other contemporaries who warned Darwin that "selection" is not a happy word to express the facts about species evolution. Darwin himself was conscious of the weakness of the metaphor. Later, Commons suggested that this "selection" was a misnomer. If this is the case, perhaps it is time to accept that strict "selection" is just a human procedure, an artificial mechanism. Selection supposes "a selector," as Spencer famously claimed. Since there is no such selector in nature, the metaphor becomes misleading. In this sense, the very idea of "selection" reveals the residues of an anthropocentric and teleological language.

Darwin would not have accepted that selection is merely a political creation. However, he was conscious that political rules may influence nature producing different, i.e., artificial, impacts. Apart from his concerns about asylums and hospitals, he believed that policies in favor of trade unions, cooperatives, and the poor, steered selection in the wrong direction (Ruse, 2013, p. 15). In this essay, I have essentially followed Darwin's

https://doi.org/10.1017/pls.2020.27 Published online by Cambridge University Press

reasoning, but instead of assuming that political interventions distort or discourage natural selection by artificially favoring the poor, I have sustained that political interventions actually exacerbate the selection as they artificially destroy the conditions of basic equivalence: self-sufficiency and self-limitation become obstructed, struggle is exacerbated, spontaneous balance is gradually broken, and beings are steered down an unexpected path of degeneration.

This scenario is certainly nonfictional. Biologists argue that "Darwin's faith in this perpetual diversification of life had been misplaced; the effectiveness of evolutionary process in generating diversity could not be ensured in a world dominated by humans" (Steffes, 2013, p. 396). If this is the case, we might say, in Darwin's language, that as far as human class has become the main evolutionary force (Chisholm & Burbank, 2001; Goonatilake, 1999), artificial selection is instigating the antievolutionary tendencies that biologists report (Bostrom, 2004; Ceballos et al., 2017; Palumbi, 2001).

As for political theory, we might conclude that political institutions do not match the ecological constitution of the world, at least not completely or successfully. In terms of Gagnon's theory, basic democracy seems not only to be not expanding, but it is increasingly undermined by the failures of current political designs. Questions remain as to whether the existing asymmetries are inevitable, necessary, and convenient for human aspirations; whether the design of current political institutions is optimal; or whether it can be improved for ecological purposes. This should lead us to inquire about the eventual adaptive or maladaptive character of current (and future) political institutions, exploring alternative designs.

This is not to say that political institutions are the only factor producing disruptive impacts on living beings' condition. However, political institutions establish the basic conditions for human interactions within the ecological world. Under such conditions, concerns about species' basic equivalence and the selective role performed by political institutions are far from merely speculative.

References

Ariew, A. (2008). Teleology. In D. Hull & M. Ruse (Eds.), *The Cambridge companion to the philosophy of biology* (pp. 160–181). Cambridge University Press. https://doi.org/10.1017/CCOL9780521851282.009

Beattie, P. (2017). The "chicken-and-egg" development of political opinions: The roles of genes, social status, ideology, and information. *Politics and the Life Sciences*, 36(1), 1–13.

Bejan, A. (2020). *Freedom and evolution: Hierarchy in nature, society, and science*. Springer. https://doi.org/10.1007/978-3-030-34009-4.

Béland, D. (2017). Ideas, interests, and institutions: Historical institutionalism revisited. In A. Lecours (Ed.), *New institutionalism: Theory and analysis* (pp. 28–50). University of Toronto Press.

Bensaude-Vincent, B., & Newman, W. R. (Eds.). (2007). *The artificial and the natural: An evolving polarity*. MIT Press.

Bookchin, M. (1982). *The ecology of freedom: The emergence and dissolution of hierarchy*. Cheshire Books.

Bostrom, N. (2004). *The future of human evolution*. In C. Tandy (Ed.), *Death and anti-death* (Vol 2, pp.339–371). Ria University Press.

Bowler, P. J. (2013). *Darwin deleted: Imagining a world without Darwin*. University of Chicago Press.

Breiner, P. (2004). "Unnatural selection": Max Weber's concept of *auslese* and his criticism of the reduction of political conflict to economics. *International Relations*, 18(3), 289–307. https://doi.org/10.1177/0047117804045194

Buston, P. M., & Cant, M. A. (2006). A new perspective on size hierarchies in nature: Patterns, causes, and consequences. *Oecologia*, 149, 362–372. https://doi.org/10.1007/s00442-006-0442-z

Butler, E. (1983). *Hayek: His contribution to the political and economic thought of our time*. Temple Smith.

Ceballos, G., Erlich, P., & Dirzo, R. (2017). Biological annihilation via the ongoing sixth mass extinction signaled by vertebrate population losses and declines. *Proceedings of the National Academy of Sciences*, 114(30), E6089–E6096. https://doi.org/10.1073/pnas.1704949114

Chisholm, J. S., & Burbank, V. K. (2001). Evolution and inequality. *International Journal of Epidemiology*, 30(2), 206–211.

Commons, J. R. (1897). Natural selection, social selection, and heredity. In J. C. Ridpath (Ed.), *The arena* (Vol. 18, pp. 86–148). Arena Company.

Commons, J. R. (1924). *Legal foundations of capitalism*. Macmillan Company.

Cuddington, K. (2001). The "balance of nature" metaphor and equilibrium in population ecology. *Biology and Philosophy* 16: 463–479. https://doi.org/10.1023/A:1011910014900

Darwin, C. (1909). *The origin of species*. P. F. Collier & Son.

Darwin, C. (1981). *The descent of man and selection in relation to sex*. Princeton University Press. (Original work published 1871)

Degler, C. (1991). *In search of human nature: The decline and revival of Darwinism in American social thought*. Oxford University Press.

Delisle, R. G. (2019). *Charles Darwin's incomplete revolution: The* Origin of Species *and the static worldview*. Springer Nature.

Diehm, C. (2014). Darwin and deep ecology. *Ethics & the Environment*, 19(1), 73–93.

Dobzhansky, T. (1967). *Evolution, genetics, and man*. John Wiley and Sons.

Dopfer, K. (2001). *Evolutionary economics: Program and scope*. Springer.

Dryzek, J. (1987). *Rational ecology: Environment and political ecology*. Basil Blackwell.

Erev, S. (2019). Belonging to spontaneous order: Hayek, pluralism, democracy. *Democratic Theory*, 6(1), 1–26. https://doi.org/10.3167/dt.2019.060102

Franck, D., & Ribowski, A. (1993). Dominance hierarchies of male green swordtails (*Xiphophorus helleri*) in nature. *Journal of Fish Biology*, 43(3), 497–499. https://doi.org/10.1111/j.1095-8649.1993.tb00586.x

Franz, M., McLean, E., Tung, J., Altmann, J. & Alberts, S. C. (2015). Self-organizing dominance hierarchies in a wild primate population. *Proceedings of the Royal Society B: Biological Sciences*, 282(1814), 20151512.

Fodor, J., & Piattelli-Palmarini, M. (2010). *What Darwin got wrong*. Farrar, Straus and Giroux.

Gagnon, J. (2013). *Evolutionary basic democracy: A critical overture*. Palgrave Macmillan.

Ghiselin, M. T. (2005). The Darwinian revolution as viewed by a philosophical biologist. *Journal of the History of Biology,* 38, 123–136. https://doi.org/10.1007/s10739-004-6513-2

Goonatilake, S. (1999). *Merged evolution: long-term implications of biotechnology and information technology*. Gordon and Breach.

Gould, S. J. (2002). *The structure of evolutionary theory*. Belknap Press of Harvard University Press.

Hayek, F. A. (1948). *Individualism and economic order*. Routledge & Sons.

Hayek, F. A. (1998). *Law, legislation and liberty: A new statement of the liberal principles of justice and political economy* (Vols 1–2). Routledge.

Hodgson, G. M. (2006). What are institutions? *Journal of Economic Issues*, 40(1), 1–25.

Hume, D. (1985). Of the balance of power. In E. F. Miller (Ed.), *Essays moral, political, and literary* (pp. 332–341). Liberty Fund.

Hunter, I. (2011). Natural law as political philosophy. In D. Clarke & C. Wilson (Eds.), *The Oxford handbook of philosophy in early modern Europe* (pp. 475–499). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780199556137.003.0023

John R. Commons. 1997. Selected Essays. edited by Malcolm Rutherford, and Warren Samuels. Taylor & Francis Group. ProQuest Ebook Central. http://ebookcentral.proquest.com/lib/uql/detail.action?docID=179947.

Krause, S. R. (2016). Politics beyond persons: political theory and the non-human. *Political Theory*. Advance online publication. https://doi.org/10.1177/0090591716651516

Kricher, J. (2009). *The balance of nature: Ecology's enduring myth*. Princeton University Press.

Kropotkin, P. (1972). *Mutual aid: A factor of evolution*. New York University Press.

Kukathas, C. (1989). *Hayek and modern liberalism*. Clarendon Press.

Low, N., & Gleeson, B. (1998). *Justice, society and nature: An exploration of political ecology*. Routledge.

Malthus, T. (1826). *An essay on the principle of population, or a view on its past and present effects on human happiness*. John Murray.

Marciano, A. (2009). Why Hayek is a Darwinian (after all)? Hayek and Darwin on social evolution. *Journal of Economic Behavior & Organization*, 71(1), 52–61. https://doi.org/10.1016/j.jebo.2007.04.005

Masters, R. D. (1990). Evolutionary biology and political theory. *American Political Science Review*, 84(1), 195–210.

Masters, R. D. (1991). Primate politics and political theory. In G. Schubert & R. D. Masters (Eds.), *Primate politics* (pp. 221–243). University Press of America.

Meloni, M. (2014). How biology became social, and what it means for social theory. *Sociological Review*, 62, 593–614.

Moore, G. E. (1971). *Principia Ethica*. Cambridge University Press.

Naess, A. (2005). The shallow and the deep, long-range ecology movement: A summary. In J. S. Dryzek & D. Schlosberg (Eds.), *Debating the Earth*. Oxford University Press.

Palumbi, S. R. (2001). Humans as the world's greatest evolutionary force. *Science, New Series*, 293(5536), 1786–1790.

https://doi.org/10.1017/pls.2020.27 Published online by Cambridge University Press

Polanyi, K. (2001). *The great transformation*. Beacon Press.

Richards, R. (1999). Darwin's romantic biology: The foundation of his evolutionary ethics. In J. Maienschein & M. Ruse (Eds.), *Biology and the foundations of ethics* (pp. 113–153). Cambridge University Press.

Ruse, M. (1975). Charles Darwin and artificial selection. *Journal of the History of Ideas*, 36(2), 339–350.

Ruse, M. (Ed.). (2013). *The Cambridge encyclopedia of Darwin and evolutionary thought*. Cambridge University Press.

Sapp, J. (2016). The symbiotic self. *Evolutionary Biology*, 43 (4), 596–603.

Sauerland, D. (2015). Ideologies, institutions, and the new institutionalism. In J. D. Wright (Ed.), *International Encyclopedia of the Social & Behavioral Sciences: Second Edition* (pp. 561–572). Elsevier.

Schmidt, V. A. (2011). Institutional theory. In B. Badie, D. Berg-Schlosser, & L. Morlino, *International encyclopedia of political science* (pp. 1188–1199). Sage Publications.

Shook, J. R. (2009). Comparative political philosophy categorizing political philosophies using twelve archetypes. *Metaphilosophy*, 40(5), 633–655.

Shrader-Frechette, K. (2008). Ecology. In D. Jamieson (Ed.), *A companion to environmental philosophy* (pp. 304–325). Blackwell.

Somit, A. (1991). Democratic philosophy: An endangered species? In A. Somit & R. Wildenmann (Eds.), *Hierarchy and democracy* (pp. 23–44). Carbondale and Edwarsdille.

Somit, A., & Peterson, S. A. (1997). *Darwinism, dominance, and democracy, the biological bases of authoritarianism*. Praeger.

Steele, E. J., Lindley, R. A., Blanden, R. V., Lamarck, J. B. P. A. D., & Darwin, C. (1998). *Lamarck's signature: How retrogenes are changing Darwin's natural selection paradigm*. Allen & Unwin.

Steffes, D. (2013). Darwin and the environment. In M. Ruse (Ed.), *The Cambridge encyclopedia of Darwin and evolutionary thought* (pp. 391–396). Cambridge University Press.

Steinmo, S. (2010). *The evolution of modern states*. Cambridge University Press

Suzuki, D. (1997). *The sacred balance, rediscovering our place in nature*. Allen & Unwin.

Townsend, J. (1786). *A dissertation on the Poor Laws*. https://socialsciences.mcmaster.ca/econ/ugcm/3ll3/townsend/poorlaw.html.

Trevors, J. T., & Saier, M. H., Jr. (2010). A tale of two worlds: The natural world and the artificial world. *Water, Air & Soil Pollution*, 205, 37–38. https://doi.org/10.1007/s11270-007-9444-7

Undersrud, D. (2014). On natural law and civil law in the political philosophy of Hobbes. *History of Political Thought*, 35(4), 683–716.

United Nations. (2019, May 6). *UN report: nature's dangerous decline 'unprecedented'; species extinction rates 'accelerating.'* https://www.un.org/sustainabledevelopment/blog/2019/05/nature-decline-unprecedented-report/

United Nations Department of Economic and Social Affairs (UNDESA). (2020). *UNDESA World Social Report 2020: The challenge of inequality in a rapidly changing world*. https://www.un.org/development/desa/dspd/world-social-report/2020-2.html

Wallace. A., R., (1870). *Contributions to the Theory of Natural Selection*. New York: Mc Millan & Co, 1870. pp. 265-267.

Ward, L. F. (1911). *Dynamic sociology* or *applied social science*. Appleton and Company.

Weber, M. (1964). *Economía y sociedad, esbozo de sociología comprensiva*. Fondo de Cultura Económica.

https://doi.org/10.1017/pls.2020.27 Published online by Cambridge University Press