Social Epistemology Transformed: Steve Fuller's Account of Knowledge as a Divine Spark for Human Domination

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Abstract: In his new book, *Knowledge: The Philosophical Quest in History*, Steve Fuller returns to core themes of his program of social epistemology that he first outlined in his 1988 book, *Social Epistemology*. He develops a new, unorthodox theology and philosophy building upon his testimony in *Kitzmiller v. Dover Area School District* in defense of intelligent design, leading to a call for *maximal human experimentation*. Beginning from the theological premise rooted in the Abrahamic religious tradition that we are created in the image of God, Fuller argues that the spark of the divine within us distinguishes us from animals. I argue that Fuller's recent work takes us away from key insights of his original work. In contrast, I advocate for a program of social epistemology rooted in evolutionary science rather than intelligent design, emphasize a precautionary and ecological approach rather than a proactionary approach that favors risky human experimentation, and attend to our material and sociological embeddedness rather than a transhumanist repudiation of the body.

Keywords: social epistemology, theodicy, precautionary principle, transhumanism, evolution, intelligent design

Steve Fuller burst onto the academic scene with his provocative synthesis of opposites in *Social Epistemology* in 1988, which brought together constructivist sociology of science with normative philosophy of science, not to mention analytical and continental philosophy (Fuller 1998). Defining social epistemology in his new book, *Knowledge: The Philosophical Quest in History*, as "the normative study of knowledge as a product of social organization" (Fuller 2015a, 4), Fuller can be credited with virtually bringing an entirely new field into existence, founding a journal also called *Social Epistemology*, which pushed views together that were unpopular in their home fields. Normative philosophy of science was not to be focused on individual knowers and their relationship to an external reality, but should engage in a kind of social and political philosophy of science focused on knowledge's social organization and its attendant tradeoffs of costs and benefits. Constructivist work in Science and Technology Studies (STS) was not to be focused on case studies emphasizing that science cannot be wrenched from its social context, but should contribute grounds for remaking the knowledge enterprise in ways responsive to our collective input.

 In *Knowledge: The Philosophical Quest in History* (2015a), Fuller returns to core themes of the program outlined in 1988, showing how the evolution of his views over the past three decades pushed his original program in new directions.

William T. Lynch

In the process, he explores how developments in twentieth-century sociology and philosophy of science, economics, psychology, theology, and history alternately facilitated or impeded the development of a larger perspective on what knowledge is (or can be) that would make possible the liberation of human capacities from self-imposed restraints. In particular, this book argues for the compatibility and relevance of Fuller's work on intelligent design to social epistemology, in the aftermath of Fuller's testimony on behalf of including intelligent design in the science curriculum in *Kitzmiller v. Dover Area School District*.

Normative Social Epistemology

For those like me skeptical of Fuller's recent anti-Darwinian polemics, the new book does at least have the virtue of providing a clear normative perspective not only on science, but also on the collective mission of humanity as a whole. By contrast, early discussion of the normative components of social epistemology tended to be more programmatic and hypothetical. In fact, I think it is possible to see the book under review as the culmination of the third stage of normative reflection in Fuller's writings.

The first stage, call it *hypothetical normativity*, was epitomized by the argument that it was absolutely necessary to decide how inquiry was to be organized and that opting out of this discussion was an abandonment of intellectual responsibility. Here, while constructivist sociology was the empirical program taken to provide the source of data to guide judgment (with experimental psychology later thrown in for good measure – Fuller 1989), the real basis for normativity was the economist's concern with economic tradeoffs (developed in chapter 2 of the volume under review).

Building on his dissertation on Herbert Simon's concept of bounded rationality (Fuller 2015a, 15), Fuller argued that there was no way to *maximize* truth, not least since there was no single entity to maximize but a series of different socially organized ways of producing knowledge that evidenced the incommensurability of perspectives inherent to language (Fuller 1988, ch. 5). Unlike the constructivists, he did not conclude that each scientific discipline ought to be left to its own inclinations, but that the knowledge policy maker should enforce a common currency to *overcome* incommensurability, partly based upon the values that the public decides ought to frame the process of inquiry (Fuller 1993).

The second stage of Fuller's normative reflections could be called a quasi-socialist *planning of science*. In this stage, Fuller interrogated class conflict between knowledge workers and "knowledge management" (Fuller 2001) and drew inspiration from the finalization of science movement in Germany, where a shift was advocated from a focus on basic science to science applied to serve human interest (Böhme et al. 1983). This quasi-socialist conception of science fits well the idea that science ought to be directed to some larger human goal

than mere accumulation of knowledge and that traditional elites, in science or politics, had stood in the way (Fuller 2015a, 203-204, 219).

Accompanying this stage of Fuller's writings were some of his most historical writings, revealing that science did respond to cultural imperatives that shaped inquiry in lasting ways (Fuller 1997). Crucially, this involved an in-depth examination of the way in which Thomas Kuhn's *The Structure of Scientific Revolutions* led us astray, establishing a Cold War-inspired compromise that protected the autonomy of science from what was seen as potentially demagogic political interference. The heroes of Fuller (2000)'s examination of the Cold War roots of the ascendancy of Thomas Kuhn were those politicians and scientists who wished the public to have its say in how research funds were spent. In this sense, a democratic populism filled out the hypothetical normativity of stage 1 and there was a shift away from the standpoint of the philosopher-king enforcing austerity. The tension between stage one and stage two can still be seen in his current thinking, as Fuller (Fuller 2015b) defends neoliberalism's disruption of disciplinary autonomy as a good thing, while his argument in the current volume is that STS has retreated from a richer sense of normative evaluation by valorizing market discipline (Fuller 2015a, 208-209).

The third stage develops themes that emerged after his testimony in *Kitzmiller v. Dover Area School District*, and called for *maximal human experimentation*. Beginning from the theological premise rooted in the Abrahamic religious tradition that we are created in the image of God, Fuller argues that the spark of the divine within us distinguishes us from animals. The real philosophical error of Darwin's science was that it lowered our expectations as to what the human project could accomplish once we set our divine minds to it. With this theological premise, Fuller sought to roll back all the obstacles to radical improvement of the human species, including academic dogmatism (Fuller 2002), regulatory caution (Fuller and Lipińska 2014), ecological thinking (Fuller 2006), and humanist essentialism (Fuller 2011).

A New Science for Transhumanism

The positive program aligned itself with technological transhumanism, where radical technological transformation of human nature was encouraged, potentially abandoning our merely carbon-based existence for some higher form. Fuller downplays the risks of transforming ourselves and the world technologically by extending the economist's concern with tradeoffs between costs and benefits to a cosmic, theological level. Drawing on the idea of theodicy, which reconciles God's perfection with the existence of evil, suffering, and other imperfections that are all presumed to be part of a larger plan, Fuller enjoins us to think of the project of humanity in the same grand fashion.

Will and agency figure as key values and caution and historical determination obstacles to our destiny. Thus, in truth, Fuller's views have less to do with the traditional religious conservatism of some of the intelligent design

proponents challenging school curricula in the U.S. than his testimony in *Kitzmiller v. Dover Area School District* would suggest. Instead, his views reflect the science-fictional emphasis of futurist writers and transhumanists who seek cognitive and physical enhancement of the human body, the elimination of aging, and the transformation of consciousness from bodies to machines under the guise of bringing about a posthuman condition (Kurzweil 1999). The roots of this view – seeking science-based 'spiritual' transformation of the human condition into carbon-free masters of the universe – ironically trace to many of the scientists involved in demonstrating the chemical underpinnings of life leading to the modern synthesis in biology (Fuller 2015a, 197-99). These scientists, including J.B.S. Haldane, Julian Huxley, and J.D. Bernal, were also influential in the development of science studies, evidencing a curious fusion of modernist, Marxist, atheist, and eschatological themes (Midgley 1992, chs. 2, 14; Nye 2011, ch. 6; Lessl 2002).

Common to all three of Fuller's normative perspectives was a hyperbolic response to the recognition of uncertainty and indeterminism in science. The so-called Duhem-Quine thesis asserts that theories are underdetermined by the empirical data, such that it is always possible to construct alternative, empirically equivalent theories to those accepted consensually by scientists. For conservative philosophers, this raised the question of how to defend the rationality of science, given this residue of conventionalism. The status quo was presumed rational and alternative, empirically equivalent theories were to be avoided whenever possible (Fuller 2015a, 158). Sociologists drew another corollary, borrowing from Wittgenstein, that consensus was socially enforced (Lynch 2005). They failed to take the next step that the conclusions of science should or could be changed, and the general conclusion of post-Kuhnian science studies was that one ought to defer to the experts (Collins 2014; Shapin 1994).

Expertise, on this view, was self-warranting, a view that has been vehemently critiqued and rebuked by Fuller over the years (Fuller 2004). The social epistemological corollary, then, was that one ought to explicitly and consciously decide just how the openness and indeterminancy of science was to be handled, rather than relying upon the accidents of history or the discretion of elites. For stage one Fuller, this meant that philosophers of science were defecting from their responsibility to hold science accountable for its choices. For stage two Fuller, this meant that the public should have much more say over the direction of science than allowed to them by the gatekeeping philosophies of science since Kuhn. For stage three Fuller, this meant that we can remake nature itself – including human nature – as we wish. In theological terms, creation has been made for us to act upon and, in some sense, complete, as apprentice divinities ourselves.

Human Knowledge in the Image of God

In *Knowledge*, Fuller defends this view that "humans are gods in the making" (Fuller 2015a, 1) as a fully general theory of knowledge. In this sense, it is his most hyperbolic book and his most metaphysical: it projects indeterminancy onto nature itself, but leaves humans as the creatures responsible for making it determinate by our own activity.

Whereas Quine thought to change scientific theories conservatively, where there is a compelling need, Fuller wants to *maximize* the change that indetermininancy makes possible. Note that one doesn't need to be enamored of the status quo or opposed to pushing along scientific dissent and radicalism to think that this is not the best strategy. Fuller, however, is particularly allergic to any hint of "deference" (Fuller 2015a, 3), not only to experts but also to reality itself (see the extended critique of deference to expertise in chapter 5). Hence the importance of a complete reconceptualization of what knowledge is – above all else, it is not a correspondence to an underlying, brute reality. Rather knowledge is something that has to do with making or doing rather than observing or reflecting (compare Pérez-Ramos 1988; Lynch 2001).

Consequently, anything that limits our freedom to remake the world is an obstacle to knowledge, and that especially includes the self-imposed blinders associated with philosophy of science and epistemology, and similar disciplinary endeavors to define and delimit science addressed in this book. While philosophers have long discussed a residual 'conventional' component to knowledge, conceived as an unwanted intrusion of arbitrariness into our picture of reality, Fuller wants us to understand this conventional component as a freely chosen social convention (Fuller 2015a, 12). We decide how to interpret reality in order to best facilitate the manipulation and transformation of brute reality to serve our purposes. The emphasis here is on the imposition of our *will* on brute matter, rather than our passive reflection of it. The fact that it is a social contract also means that epistemology is really a species of political philosophy.

The problem with this way of looking at things is as much ethical as it is epistemological. Fuller has taken political economy's emphasis on the hidden hand of the market, miraculously transforming human misery into aggregate utility, into a principle that applies to the universe itself. While admitting that it might only be useful to assume the existence of a God just in order to motivate us to transform the world as if it were created for our use (Fuller 2015a, 1), his appeal to theodicy as the solution to the problem of evil and suffering given the existence of an all-powerful God can excuse any level of suffering as part of God's plan, "as total knowledge will justify all the sacrifices that have preceded it" (Fuller 2015a, 263).

This kind of cosmic utilitarianism is the calling card of the millennialist enthusiast, the believer in the reign of God, the coming right-wing or left-wing utopia, or the end of history. The Darwinist needs no such consolation, since we were not placed here intentionally and whatever suffering or evil exists is the

blind product of evolution. Theists, on the other hand, must seek to understand what is the *purpose* of suffering. Fuller gives two answers: one, the existence of suffering must serve the purpose of a larger plan by God, and two, God must struggle (as we do) to make his intentions real given the resistance of ordinary matter (in this sense, Fuller denies God's omnipotence). The latter point is connected to the Gnostic inheritance of transhumanist thinking and I will have more to say about this below.

But the former is a particularly difficult claim to swallow, particularly in the aftermath of the century of horrors, of the Gulag and the Holocaust. It is hard to believe that anyone can accept that such evils are part of a larger plan or that that would excuse a god from condemnation who resorted to such means for some end we cannot yet fathom. For Fuller, "theodicy provides the clearest precedent for our valuing all errors – even evils – as learning experiences en route to a just world order" (Fuller 2015a, 249).

For those religious believers who test high on psychological measures of authoritarianism – who believe obedience to authority and exclusion of outsiders are key imperatives – the acceptance of suffering as God's hidden plan makes sense as a kind of willful ignorance (Taub 2016). In Fuller's case, however, his views are almost reflexively anti-authoritarian, so such an interpretation will not work. Rather, like a good Leninist, Fuller wants to break a few eggs in the present (and the past) so that we can make an omelet in the future.

This kind of revolutionary modernism excuses all the sacrifices that we can be compelled to carry out to make freedom possible for the children of the revolution. Despite calling for an end to false abstractions in our view of knowledge in *Social Epistemology*, much of Fuller's discussion of our bold, new future is incredibly abstract. So let us just translate how a proactionary, transhumanist theodicy might spell out in practical terms: there would be a shift from a precautionary protection of human health and the environment to seizing every opportunity for the emergence of new powers and possibilities for human enhancement without being held back by dour risk assessments and the like. In Fuller's views, our very progress in gaining scientific knowledge depended upon our willingness to explore risky ideas and a retreat to a precautionary approach would mistakenly imply "the existence of inherent limits to our capacity for action" (Fuller 2015a, 166). Instead, we ought to learn from our mistakes, via a 'proactionary principle' generalized from Popper's falsificationism, which implies that we should not be afraid to make frequent mistakes, however harmful they may be in terms of health or ecological damage (Fuller 2015a, 166).

The resulting techno-experimental eugenics will favor the select few at the expense of the many, as the many who suffer chemical assaults, health impairment, or derangement by new technologies of personal enhancement are sacrificed to make possible the emergence of Humanity 2.0, a kinder name for Nietzsche's Übermensch (Fuller 2011). The ecological sustainability of our planet will be jettisoned and our companionship with other animals set aside because

this is not our home, but a launching pad for our glorious future among the stars (or amidst the electrons in our computers). Global warming and other alarmist threats will be embraced as opportunities for shaking out the old and bringing in the new (Fuller 2015a, 279).

Darwin's Wrong Turn

The adoption of Darwin's theory of natural selection is the key wrong turn for Fuller, in that it made possible a negative view of human capabilities and failed to explain how science itself was possible. In order to develop this idea, it was necessary for Fuller to explain why his own early writings on the materialist basis of knowledge have to be reinterpreted. In particular, in his second book, Fuller endorsed evolutionary biology as the key basis for a naturalistic science of science in the mold of the strong program in the sociology of science (Fuller 1989). Social epistemology was the theory of knowledge that explained how knowledge could be simultaneously "in and about the world" (Fuller 1991). Popper's world three and the like – areas where disembodied knowledge existed – were anathema from the point of view of Fuller's early hypermaterialist and naturalistic take on knowledge.

The difference, Fuller now tells us, is that naturalism must be reflexive in being able to account for the emergence of naturalistic science in the first place. He argues that the knowledge produced by science is something that does not merely organize our everyday experience, but posits laws holding even where we have no possible experiential access (in the center of black holes, for instance) and in mathematical language that that has a level of precision and power that belies science as a mere codification of 'animal' induction.

In this sense, reflexive naturalism requires explaining the existence of knowledge in the first place, which cannot be done except by appealing to a supernatural or transcendental perspective (Fuller 2015a, 60). Naturalism is naturalistically falsified by the history of science, for the history of science is held to demonstrate that we can only do science on the assumption that the world was created for us in a language we can decode and understand. This revisionist historiography is facilitated by a less materialist and more Platonic view of knowledge (Fuller 2015a, 262), as Fuller mistakenly follows Koyré in believing that Galileo innovated through thought experiments rather than real ones (Fuller 2015a, 61). Fuller's conclusion is that

> the power afforded by scientific knowledge is decidedly non-Darwinian: It takes us out of our natural habitats, leading us to radically transform and even replace them, while we extend our horizons to the heavens (Fuller 2015a, 61).

The fact that our scientific insight may be an evolutionary byproduct of capacities we inherited from a process of natural selection is rejected (Lynch 2016).

William T. Lynch

The Cultural Evolution of Science

For Fuller, the 'universal' character of knowledge lacks an explanation by evolutionary naturalism. Admittedly, part of the problem here is the anemic character of what passes for evolutionary epistemology in the philosophy of science. Evolutionary epistemology is understood by many philosophers to be a way of cobbling together naturalistic justifications of (roughly) traditional epistemological conclusions about knowledge: we have accurate knowledge, we gain it through experience, and so forth.

But there should be no equation of an adaptive cultural formation and truth, as pointed out by evolutionary biologist David Sloan Wilson when he turned to consider evolutionary epistemology. Wilson shows that adaptations are not equivalent to truth, as Fuller believes is inherent to the Darwinian view (Fuller 2015a, 263). The best way to survive and reproduce in an environment is not necessarily to have an accurate representation of the world. It is better to infer that a predator lurks in the bushes when it does not than to make the opposite error and become that predator's dinner (Wilson 1990).

Within the evolutionary study of religion, it is this adaptive, but false attribution of agency to the world around us that is taken to underwrite the prevalence of belief in God in our species (Boyer 2001). I expect that it is a little more complicated than that, and evolutionists remain divided on whether religion itself tends to be adaptive for us, as argued for by group selectionists like Wilson (Wilson 2002), or that religious ideas are self-propagating memes akin to viruses that use us for their own benefit (Dawkins 2006a, 2006b). My own sense is that science and religion both exploit human biological capacities that emerged for other reasons, but that make possible a distinctly cultural evolution of human institutions (Lynch 2016).

Part of Fuller's hostility to Darwin has to do with emphasis on a distinctly autonomous science of sociology that has been eviscerated by the diffusion of sociobiology and evolutionary psychology throughout the social sciences (Fuller 2006). However, at the same time that a reductionist form of biological determinism was emerging as human sociobiology (Wilson 1975), the application of Darwinian approaches to cultural phenomena like language was emerging (Cavalli-Sforza and Feldman 1981; Boyd and Richerson 1985). The distinctive importance of sociocultural processes was being underwritten by Darwinian principles, as multiple levels of selection beyond the genetic were being uncovered. The competitive aspect of natural selection, epitomized by the phrase 'struggle for existence,' is now seen increasingly to be dependent upon prior establishment of cooperative relationships, either at the level of the cell, the genome, or human culture (Maynard Smith and Szathmáry 1995). Thus, the best naturalistic view of science would be that it is a peculiar result of cultural evolution, another level of selection apart from genetic evolution, where individual interests at the genetic level can be subordinated if group selection is strong enough (Harman 2010).

In the case of humans, warfare between groups may ironically have stimulated cooperation within groups. The altruistic defender of the group would normally be selected against, but in the face of fierce competition *between* groups, those groups with altruistic warriors (sacrificing life for the group) thrive better than others (Bowles 2006). The cultural evolution of religion shows the same tendency, as classic Durkheimian mechanical solidarity emerged to facilitate the survival of intellectual beliefs, religious rituals, and the groups associated with them (Wilson 2002).

The cultural evolution of religion was particularly applicable when group membership and survival lined up with religious belief systems. The drive to secularism began already when a more complex division of labor and interconnectedness led to organic solidarity. Especially by the time the modern world system developed, where cultural 'memes,' including religion, could be more free-floating and subject to individual adaptation within social groups, the close alignment of group selection and cultural evolution gave way, with more 'horizontal' transmission of cultural products (and hybridity) operative (Blute 2010, Boyd et al. 1997). Thus, the possibilities for human cultural creativity are opened up by breaking apart the temporary alignment of selective forces with group competition.

Epistemology as Divine Psychology

In his discussion of "epistemology as divine psychology" (Fuller 2015a, ch. 2), Fuller generalizes his critique of Darwinism under the banner of intelligent design as what he calls a "'Left Creationist' affirmation of science" (Fuller 2015a, 86). What does he mean by this? Three points can be identified, all connected to a view of the practice and history of science suffused with religious inspiration.

First, science is connected inherently to natural theology. Natural theology, for Fuller, is the belief that God communicates with us through his design of the natural world in a law-like, and indeed, language-like, form that allows us to be sort of apprentice creators. We learn to uncover how God created the world in the first place and begin to practice the art of creation ourselves. This follows from the fact that we were created *in imago Dei*.

Fuller has a quite strong view of what this means – indeed, it is virtually heretical in a Christian sense as it a) depends upon humans fully sharing in the potential for divinity with God, and b) it also leaves God (and ourselves) constrained to overcome the resistance of matter in implementing his (and our) will. The former view resembles Renaisssance humanist Pico della Mirandola's heretical take on our human capacity for divine action (Cassirer 1948). Fuller and Mirandola share a belief in the human capacity to remake itself, the limitless capabilities of human intellect, the view that humans are not tied to biological creation, that they are free to choose their own course of action, and that they can ascend the chain of being to become like angels and gods (Fuller 2015a, 74-75).

The later view is basically the Gnostic heresy and it underwrites Fuller's transhumanism, as the full test of whether we have delivered on the promise of the divine within us is whether we can become 'transhuman' by leaving behind our merely carbon-based and materially constrained way of life for a new way of being human, what Fuller calls 'Humanity 2.0' (Shiffman 2015; Malapi-Nelson 2016; Lessl 2002). Likewise, Fuller's God is not omnipotent, and struggles with matter to realize his creation; matter preexists God on his reading of Genesis (Fuller 2015a, 75). Whatever one thinks of this imaginative theological construct, it is easy to see that it is inherently antithetical to any suggestion that we are creatures bound by our material and social embodiment, and so, in that sense, looks like a retreat from the initial program of social epistemology. It is also hostile to nature as such, and is reflected in Fuller's opposition to restraining human self-experimentation as urged by insufficently 'proactive' traditions of thought like environmentalism or animal rights.

Second, Fuller's Left Creationism asserts that only intelligent design can explain why we pursue science in the first place, since a materialist view – and especially a Darwinian view – is held to leave humans with no motivation to pursue science and with no explanation of why they would succeed in uncovering knowledge of the world if God did not write the book of Nature in a way that could be understandable to us. As Fuller puts it, "human artifice is marked by the intelligence of the divine artificer in whose image we are created" (Fuller 2015a, 87). In other words, we can only make artificial things because God has made nature. An emphasis on design sciences that seek to create new structures in the world rather than just represent the world from afar is held to be fundamentally impossible in a Darwinian world.

Related to that point, Fuller makes much of our capacity to construct 'universal' theories that give us knowledge valid for regions of space and time we will never experience directly. Such universal knowledge would never be the outcome of evolutionary adaptation, according to Fuller, so giving an evolutionary explanation of how knowledge is possible is preempted at the outset. It would require extended discussion to show where Fuller goes wrong in thinking about the difference between explanations based on intelligent design and those based on natural selection. Key to his line of thinking is the portrayal of Darwin's thinking as pessimistic about the meaning of life and pessimistic about the capacities for human intervention in nature. For Fuller, meaning, purpose, morality, and the like all dissolve if we were not destined to be here and are the products of contingency in nature.

Fuller's point about Darwin's pessimism about human intervention is ironic, because Darwin himself thought that artificial selection via domestication of plants and animals could actually introduce true novelties, since nature was not in fact confined to species oscillating around fixed types, as he found through the breeding of pigeons. Consequently, humans could insert themselves into the process of evolution by controlling the features selected for and thereby produce

outcomes desired by us, whereas his predecessors believed our capacity to breed domesticated animals was limited by the fixity of natural types (Lynch 2016).

The third aspect of Fuller's Left Creationism is an alternative historiography of science. After having tried to convince us that intelligent design theory is the basis for the motivation and possibility of knowledge in the first place, Fuller develops an alternative history of science in order to show that Darwin is marginal to the true revolution in biology of the twentieth century, similar to how Pierre Duhem wrote the atomists out of the history of science. There are a number of contentious ways this point is made, which all come down to separating developments in science from Darwinian accounts of evolution by natural selection by connecting them instead to the view of a book of nature authored by God providing clues for us as apprentice gods.

So much is made of Darwin's (and Stephen Jay Gould's) natural historical methods as insufficiently interventionist in order to draw a wedge between the discovery of DNA and developments in molecular biology, on the one hand, and the belief in evolution that is typically attached to them by the scientists involved. Thus, Francis Crick drew a direct connection between the discovery of DNA and Darwinian evolution, while contemporary efforts to simulate the origin of life from non-living matter proceed from active laboratory efforts to construct primitive self-replicating structures (Crick 1990; Blain and Szostak 2014). Following the playbook of intelligent design and creationism, Fuller treats molecular biology as based upon an ontology of 'information' (read as the book of Nature) that must fail to be integrated into a strictly materialist view of life as the product of blind contingency.

Evolutionary biologists have long recognized that structures put into place by evolution may constrain further evolution itself, so the variation that may emerge in any lineage would not be completely random (Kirschner and Gerhart 2005). Fuller sees this as a tacit admission of design, as he does the emergence of the science of 'evo-devo,' evolutionary developmental biology, which addresses developmental constraints of evolutionary development (Fuller 2015a, 86). None of this implies that evolutionary logic is left behind or replaced by something akin to intelligent design. Instead, the heterogeneity of views about how best to understand evolution by natural selection within science is treated simultaneously as grounds for questioning the well-foundedness of Darwin's views and as grounds for including intelligent design theorists at the table, an 'affirmative action' proposal for science that Fuller sees as a matter of "epistemic justice" (Fuller 2015a, 32-33).

In a particularly confused discussion of the debate between Richard Dawkins and Gould on the proper foundations of evolutionary biology, Fuller chastises Gould's contingentism above all, while giving a backhanded compliment to Dawkins for inadvertently advancing the theological view that the universe was created with us in mind. Where Gould denies that rerunning the

tape of evolutionary history would lead to our presence, given the vagaries of environment that were necessary to produce us, Dawkins is held to believe that our presence is overdetermined by the strong power that adaptation has in directing evolution in particular directions. While there is a clear difference between the two on just how much evolution is directed by adaptations and how much of a role contingency and non-adaptive processes play in evolutionary outcomes, neither Gould nor Dawkins subscribes to the inevitability of the emergence of humans, which would be a new, extreme kind of anthropocentrism, albeit one congenial to Fuller's perspective. The issue between Gould and Dawkins has more to do with whether adaptations are sufficiently directed by the environment to represent clear trajectories that override historical constraints (Dawkins) or whether adaptations, when they occur, must 'adapt' themselves to the preexisting constraints introduced during a long evolutionary history and the accidents of survival not tied to measured fitness (Gould) (Sterelny 2007).

Political Implications

As I have suggested, perhaps the most disturbing part of Fuller's recent theological turn is his reliance upon theodicy, which even in secularized forms would license great misery as means to some unspecified higher end. This is not a problem if an active, interventionist God is not responsible for creation! Indeed, it is one of the fundamental weaknesses of standard, monotheistic belief systems that they postulate an omnipotent God that allows evil to happen. In this sense, theodicy is just an idiocy that looks to make this cognitive dissonance go away.

Put in the context of his theodicy, Fuller's transhumanism and proactionary imperative are especially callous and offensive, as great suffering and misery can be consciously chosen if it allows us to pursue a higher calling as Nietzchean supermen. For Fuller, the emergent 'Humanity 2.0' that would emerge from radical human experimentation would become "a being that perhaps abandons much of its carbon-based biological inheritance to be resurrected in a form that permits a less impeded version of our divine qualities" (Fuller 2015a, 89). If, in pursuit of this grand project, we run roughshod over protections against poisoning ourselves and our environment, ethical restraints that limit human experimentation and enhancement, and concern with the place and suffering of other species, that is no legitimate objection.

Indeed, in holding us back from our ultimate destiny, such precautionary and protective approaches are positively misanthropic in Fuller's estimation, not in the sense of harming real humans but in the more rarified sense that our future possibilities for transcendence are cut short by a concern with the merely mundane, worldly concerns of contingent human beings. We are not only individual creatures of spirit, struggling against material embodiment, but we are participants in a collective project of transcending nature. We are held to be a species where future possibilities of transcendence trump the merely material

and mundane concerns of ordinary politics. The present and the past must be sacrificed on the altar of the future.

This exaggerated messianism, found sometimes in stereotyped form among political Leninists who consider any means appropriate to a hypothetical future liberation, is not progressive or radical in the ordinary sense, as Fuller claims (Fuller 2015a, 89). It is not, in short, a program for remedying the actual suffering of real, live human beings. This is where Fuller comes up short from a Feyerabendian perspective, despite the epistemological anarchism at the heart of Fuller's view of science.

Paul Feyerabend always opposed the tendency of systems of thought, even those intended to liberate us, to become dogmatic sources of oppression and manipulation themselves (Feyerabend 1981). While Fuller seeks to overcome the dogmatism of contemporary scientific authority, his alternative philosophy has all the earmarks of abstraction run amok. It ends up being peculiarly indifferent to human suffering as such, rather than as a prop for an intellectual's effort to become an auteur for the unfolding story of humanity (Feyerabend 1999). Such hubris rarely goes unpunished by the gods--but then again, in our secular age, no one really takes that threat seriously, least of all Fuller.

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