

Book Reviews

Science Fiction and Philosophy: From Time Travel to Superintelligence.

SUSAN SCHNEIDER, editor. Wiley-Blackwell, 2009 (1st ed.); 2016 (2nd ed.). 350 p.
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The first edition (2009)

“Thought experiments,” writes Susan Schneider, the volume’s editor, “are windows into the fundamental nature of things” (1). Science fiction is a repository of such experiments in narrative garb, with its tales of time travel, cloning, cybernetic organisms, utopias and dystopias, and so on. Philosophical thought is aimed at investigating the fundamental nature of things. Consequently, science fiction and philosophy inevitably converge, and fruitfully so, as demonstrated by this collection. *Science Fiction and Philosophy* is based on the identification of “a number of key areas in philosophy where the interplay between philosophy and science fiction is especially rich” (2f). It collects narrative pieces, excerpts from major works of the Western tradition, and scholarly essays. The latter often comprise the discussion of movies and literature, and the volume includes lists of films and novels or tales that conjure up relevant philosophical topics. In other words, *Science Fiction and Philosophy* either encourages the examination of science fiction narratives that one may have only enjoyed as a form of entertainment, or it prompts reflection over philosophical topics and puzzles through literary and cinematographic examples, or both. A few essays were written for the volume while the vast majority are reprints. The collection is divided into five parts, although, on close scrutiny, and as it is almost inevitable in philosophy, some of them display considerable overlap.

Part I is dedicated to the issue of the reality of the external world. The first piece is a short one by philosopher **John Pollock** (1940–2009). “**Are You in a Computer Simulation?**” introduces the reader, in narrative and highly amusing fashion, to *the* everlasting philosophical puzzle at the intersection of ontology and epistemology: how can you tell with certainty that you are who (and what) you think you are, and not a “brain in a vat”? The latter being a disembodied brain, kept suspended in an appropriate liquid, and wired to a computer that generates the illusion of reality by administering electrical impulses analogous to those the brain would receive under normal circumstances (i.e. while still placed within a head—if such “normal circumstances” are real at all!). The second piece is an essay by philosopher **Nick Bostrom**. He argues, in short and compelling fashion, not only that the probability of living in a computer simulation is high, but also that if that is the case, the “best way to predict” what will happen in said simulation is still the usage of “ordinary methods” such as “extrapolation of past trends, scientific modelling,

common sense, and so on” (22). Bostrom’s essay is followed by the very well-known pages from **Plato’s** (ca. 428–348 BCE) ***Republic*** in which Socrates narrates the **Allegory of the Cave**, and by a likewise known excerpt from **René Descartes’s** (1596–1650) ***The Meditations on First Philosophy*** (1641) in which the French philosopher discusses how reality and dream (or deception) are ultimately indistinguishable. The section ends with **“The Matrix as Metaphysics,”** an essay by **David J. Chalmers** that merges the classical “brain in a vat” with the movie *The Matrix* (1999). Chalmers contends that even if the Matrix Hypothesis were true, i.e., if it were true that one is, and has always been, in “an artificially designed computer simulation of the world” (34), this would *not* result in the falsification of most of their beliefs. Chalmers namely considers it a *metaphysical* hypothesis, i.e., “a hypothesis about the underlying nature of reality” including the reality of *physics, human mind, and the world* (36) and demonstrates that the application of such a hypothesis to each one of said fields is coherent (that is, the hypothesis cannot be ruled out). Chalmers concludes, however, that we should not reject our “ordinary beliefs about the external world,” even if we had evidence that we *do* live in such a scenario. At most, we should “revise [our] beliefs about the underlying nature of [our] world” (42). Chalmers also systematically addresses and neutralizes multiple objections to his argument. While I keep the overall critical evaluation of the volume for the end, I feel compelled to anticipate that this is an excellent, crystal clear essay, in which, despite the objective difficulty of the matter discussed, Chalmers admirably keeps jargon down to a minimum.

Part II discusses free will and the nature of persons. The first piece is a hilarious, thought-provoking tale by **Daniel C. Dennett**. He narrates **“Where Am I?”** in the first person, undergoing a brain-transplant (or perhaps a *body*-transplant) experiment. Dennett’s tale, dense and entertaining, can hardly be summarized, and in any case I am not willing to spoil the readers’ amusement and surprise. Suffice it to say that, through the witty account of how, in the interests of a Pentagon mission, his brain was placed into a life-supporting mechanism in order for it to command the body from afar through transceivers attached to nerve stumps in the cranium, Dennett brilliantly manages to convey fundamental questions and original ideas, if perhaps counterintuitive ones, about the nature of the self. The second piece is **“Personal Identity,”** a lengthier and more conventional essay by **Eric Olson**, surveying the main issues related to the titular concept. As Olson makes clear, the cluster of questions revolving around the issue of personal identity, while being rooted in traditional debates such as what happens after we die (and what possibly constitutes survival after physical death), also bear major ethical implications for contemporary ethical discussions, for instance in regard to the status of embryos or of comatose persons. Olson places a special focus on the question of *persistence*, or “what is necessary and sufficient for a past or future being to be you” (71), that he is careful to distinguish from other ones it is often mixed up with. For Olson, the correct way of formulating it is this: “under what possible circumstances is a person who exists at one time identical with *something* that exists at another time (whether or not it is a person then)?” (74, emphasis in the original). In other words, Olson discards the idea that being a *person* is an essential feature of the identity that can be conserved over time. On such premises, he examines the idea that persistence is the continuity of mental features

(Psychological Approach), or that it consists of being the same biological organism (Somatic Approach), but he also carefully considers “anticriterialism,” i.e. the view according to which neither psychological nor somatic continuity may be necessary and sufficient for persistence, but “a person existing at one time is identical with a being existing at another time if and only they are identical” (76). Olson gives a detailed account of the challenges faced by each option, and concludes that the issue of persistence not only may not have a “unique right answer” (86) but also that personal identity can only be defined in the framework of “more general metaphysical considerations” (87), that is, of underlying issues that need to be addressed even before analyzing identity itself. The third piece, “**Divided Minds and the Nature of Persons**” by **Derek Parfit** (1942–2017), discusses the problems raised by the phenomena observed upon disconnecting a person’s brain hemispheres. Parfit initially seems to support the opinion that, even if one of the hemispheres is sub-dominant, that is, less developed than the other, then there are two distinct streams of consciousness. He eventually argues, however, that the number of persons involved in such an event is not two, but ultimately *none*. In Parfit’s opinion we namely are not what we believe we are: accurate scrutiny of the split-brain case, in his interpretation, supports the “Bundle Theory” i.e., that “there are long series of mental states and events [...] each series [being] unified by various kinds of causal relation” (92). In other words, analytical observation of the consequences of the hemispheres’ disconnection, in Parfit’s opinion, reveals the weakness of any explanation of consciousness in terms of a *person* or an *ego*. Imagine that a man with a split brain is holding a placard with a red half and a blue half. In one stream he is seeing red (combined with other sensations, for instance of the room around the subject), and in the other one he is seeing blue (again, combined with other sensations). If we claim that each such stream, consisting of a color plus the other sensations, is internally “unified” by being had by the same person, we ignore the fact the two streams are *not* being united; one may thus be tempted to resort to a concept of “subject of an experience” as distinct from that of *person* (each stream being unified by one such subject), but such a notion would be automatically suspicious, points out the author. Parfit suggests, then, that concepts like “person” or “ego” or “subject of experience” are “idle cogs” (97) and that the case of the split brain only sheds light on the *ordinary* fact that *there are no such unifying elements even in ordinary awareness*, the unity of consciousness being rather explained by the fact that “ordinary people are, at any time, aware of having several different experiences” (*Ibidem*). While touching upon the historical origins of the Bundle Theory, Parfit is also careful to point out the analogies between the versions in which it emerged among Western thinkers, and some teachings of the Buddha. The fourth piece is a short one by inventor and futurist **Ray Kurzweil**, “**Who Am I? What Am I?**” He starts with the observation according to which the molecules that make up our body and brain change, and rapidly at that. What persists is rather the *pattern*, but even such a pattern changes, although “slowly and in a continuum” (100). Kurzweil quickly but effectively explores the consequences (and the related dilemmas) of the fact that such a pattern could be replicated, and hence shared by another being—would that being be us? The replica may be indistinguishable by others, points out Kurzweil, but it would not be us. What about slowly replacing a brain with its “neuromorphic equivalents,” then? In such a

case, he points out, it would be difficult to draw the line where the “old me” was replaced by the “new” one; however, such replacement is ultimately what happens in our bodies normally. Kurzweil concludes his pages emphasizing that, while he remains a “patternist” as far as the issue of personal identity is concerned, he as well acknowledges that there is a subjective, ontological reality of consciousness that we have no direct access to—except within ourselves; “we can’t propose an objective consciousness detector,” he states, “without philosophical assumptions built into it” (102). The fifth piece, “**Free Will and Determinism in the World of *Minority Report***,” by **Michael Huemer**, is, as its very title makes clear, a discussion of free will in the context of Steven Spielberg’s 2002 movie loosely based on Philip K. Dick’s 1956 short story “The Minority Report.” In the movie’s dystopian reality, the police stop criminals before they take action thanks to the “precogs,” three individuals endowed with foresight of criminal actions, although from time to time one of them has a different prediction, that is, a *minority report*. If our fate is predetermined, and if there is no such thing as free will, is it just to punish someone for something that they have not committed, and that in any case they would have committed out of necessitation? Huemer explores in this regard the options of “soft determinism,” that is, a simultaneous espousal of the idea that humans *do have* freedom of will while their actions *also are determined*. For instance, one can think that a person’s actions *are* determined by past causes, but still argue that such person does have *alternative possibilities* which, if the person tried to do, they would succeed, in harmony with the laws of the world—although ultimately that person’s choice is determined. Another option is to claim that freedom is defined in regard to internal causes, such as beliefs and desires, not to external forces, determinism holding valid only for the latter. A third option is to claim that freedom *requires* determinism; otherwise, our actions would be completely random occurrences. Huemer objects, however, that criticism of soft determinism seems stronger than such options: if, as it seems to be the case, neither the laws of nature nor the events prior to our birth are up to us, then all the consequences of such events including our current acts are not up to us. Eventually, Huemer scrutinizes the arguments in support of the idea that free will does exist and that determinism is false, also known as Libertarianism (not to be confused with the political theory of the same name). One argument is that we introspectively feel our freedom while making choices. Another argument is that if determinism is true, each thinker is also determined to believe (or disbelieve) in it and therefore there is no way to *know* whether determinism is true. “Minority reports” would be interpreted by the advocates of free will as proof of its existence, while determinists would see them as nothing but a sign of the pre-cogs’ fallibility. Huemer concludes that the characters of *Minority Report*, while choosing to abolish their “Precrime system” may have had a wrong motivation since they decided to do so considering that the system was fallible; nevertheless, they did the right thing, according to Huemer, since he is inclined to espouse Libertarianism and, before an individual makes an actual choice to commit a crime, “there is no existing fact or state of affairs that makes him a ‘future criminal’ or deserving of punishment” (111). Part II beautifully ends with a one-page text by **Alvin I. Goldman**, “**The Book of Life: A Thought Experiment.**” A brief and brilliant narrative, it is one of the most entertaining of the whole collection, aimed at

sparking further thoughts about determinism and free will. The short tale is written in the first person and talks about someone who finds a tome describing their life in detail up until and including the very moment in which the book is being perused.

Part III deals with the concept of human mind: its definition, its distinction from artificial minds, and the scenarios opened up by the hybridization of human and artificial mind or the latter's enhancement. The first piece is a short story by **Isaac Asimov** (1920–1992), "**Robot Dreams**" (1986), narrating how researchers identify in a robot's declared capacity of dreaming the dangerous potential for rebellious action. The second piece, "**A Brain Speaks**," by **Andy Clark**, is another narrative in the first person singular ("I am John's brain", 122) that, not dissimilarly from previous ones, raises profound questions under a veneer of levity, making the reader realize how little we know about our brain: "we remain strangers despite our intimacy (or perhaps because of it)" (125) and we tend to forget that such organ is "in large part a survival-oriented device that greatly predates the emergence of linguistic abilities" but also that its "role in promoting conscious and linguaform cognition is just a recent sideline" (*Ibidem*).

I am tempted to call the third piece, **Ned Block's "The Mind as the Software of the Brain,"** a mini-book within the book. This chapter spans 47 pages (including two of bibliographic references). "Cognitive scientists often say that the mind is the software of the brain," starts off Block, "this chapter is about what this claim means" (26). So begins a veritable *tour de force*, occasionally enriched with diagrams, in which the reader is taken through a meticulous and not infrequently technical examination of different conceptualizations of intelligence. The author begins by discussing Alan M. Turing's (1912–1954) famous test. Turing attempted a definition of intelligence that was behavioristic, that is, formulated without resorting to mental states (that are not intersubjectively accessible) but rather in reference to dispositions, "the tendency to emit certain behaviors given certain stimuli" (126). A machine is intelligent, according to Turing, if it passes the test of, to put it bluntly, fooling a human judge to think that it is a person. Block points out, however, that if a machine is designed to perform a certain job, it is better to test it on the performance: "who cares if it doesn't pass the Turing test?" (127). Furthermore, points out Block, experience teaches that simple programs like Joseph Weizenbaum's (1923–2008) ELIZA can pass the test, which compromises its validity as even just a sufficient condition for intelligence. Another challenge is that it remains unspecified how the judges should be chosen and, if one stipulates that a judge must be knowledgeable about computers or thought, this move re-introduces a mentalistic criterion. Block delivers another blow to Turing's argument by hypothesizing a "machine that contains all conversations of a given length in which the machine's replies make sense" (131, emphasis in the original). Block demonstrates that, although such a machine processes information in an unintelligent way, it still passes the Turing test. The problem with such a test, points out Block, is that "it focuses on performance rather than competence. [The former] is evidence for competence, but the core of our understanding of the mind lies with mental competence, not behavioral performance" (132). Block also observes that Turing produced a definition of intelligence, rather than its exploration, similar to one who describes how the word "water" is used

rather than investigating its physico-chemical constitution. However, Block points out drawing on such a comparison, “water” is a *structural kind*, i.e., it has a “hidden compositional essence” (133), that is, its molecular arrangement. But there also are *functional kinds*, like “mousetrap” or “gene,” that are defined by their causal role. Intelligence belongs to this latter kind, but it still makes sense to investigate it experimentally. Functional analysis attempts to identify “primitive processes.” It tries to break down intelligent capacities to totally mechanical, and hence fundamentally bottom-level, processes. Block, however, explains in detail that cognitive science is concerned with *what* a processor does (its function) and not with *how* it does it. Since the same function can be fulfilled by different (primitive) processors (say, hydraulically or electrically), the computer model of the mind may apply to biological brains as well as to non-biological systems. Block dedicates a section of his essay to the discussion of how intentionality (or “aboutness”) and intelligence are related. The former is the capacity to represent a state of the world; the latter is the capacity to do something. Intentionality is past-oriented, and intelligence is future-oriented. Their relationship, points out Block, is controversial, since some authors contend that you can have one without the other; for instance, tree rings can represent a tree’s age, but they cannot be said to be “intelligent.” The analysis of computational systems that process *abstractions* (numbers, or things in the world), explains Block, reaches a basic level in which one can only describe a primitive processor as manipulating symbols according to syntactic rules. How are the *syntactic* and the *symbolic* related, then? In the case of our biological brains, “nature (evolution and learning) has seen to it that there are correlations between causal interactions among these [symbolic] structures and rational relations among the meanings of symbolic structures” (145). Brains, therefore, can be described as syntactic engines driving semantic engines. Primitive processors are “meaning blind”; they only “know” how to manipulate symbols and not what the symbols mean. Neuroscientists can figure out symbols in the brain by “map[ping] out relations among states of mind, and then identify[ing] aspects of these states that can be thought of as symbolic in virtue of their functions”—because “function is what gives a symbol its identity” (146). Block then moves on to discuss the challenges related to finding an account of intentionality from the perspective of the computer model of the mind. A view that is taken as a point of reference by most researchers is the one according to which “our intentional contents are simply meanings of our internal representations” (148). There are different answers to the question of how mental symbols get their meaning. One option is to claim that symbols “in the head” co-vary with states in the world. Another option, known as *functionalism*, is to claim that the meanings of the symbols boil down to their function in our thought, without resorting to any correlation whatsoever with the external world. Block also defends the concept of a language of thought from some objections. For instance, one may point out that we have an infinity of beliefs: how can they all be stored, so to speak, in the head? Block points out that causally active beliefs, that is, proto-scientific ones, are not infinite. He also points out that such a concept accounts for the fact that humans are able to think thoughts that they (as individuals, or as a species) have never thought before. Assuming that the theory is correct, he then moves on to explore whether cognitive science explanations should only refer to

the *syntax* of the language of thought or to the *content* and the symbols of which it is composed. One may think that the syntactic account is superior to a content one for two reasons. The first one is that it is seemingly more general, allowing for a representation of the psychology of people whose thoughts are not necessarily linked to reality (e.g. the senile, the disordered, etc.). The second reason is that it is seemingly more fine-grained. Block explains, however, that the syntactic approach itself may be found defective in relation to another, deeper theory. The final section of the essay is Block's critique of John Searle's "Chinese Room," a classical argument against the idea that a computing machine has a consciousness.

The fourth piece, "**Cyborgs Unplugged**," by **Andy Clark**, starts off conjuring up the 1960 paper by Manfred Clynes (1925–2020) and Nathan Kline (1916–1983) in which the term "cyborg" was used for the first time, in reference to the possibility of merging human and machine in order to better cope with the new environments that space exploration promised to disclose. Apparently, points out Clark, cyborgs have been more successful in fiction than in real life, "forty-nine years of research and development notwithstanding" (172): most university departments of Cybernetics were replaced by ones "of Computer Science, Cognitive Science, and Artificial Intelligence" (173). Clark points out, however, that we may be so fixated with the idea of *physically merging* body and machine while deeply transforming the former that we lose sight of the fact that, especially as far as communication is concerned, what matters is improvement and fluidity, *not* the penetration of "skin and skull" by devices. In this regard, Clark states that he is convinced that "the most potent near-future technologies will be those that offer integration and transformation *without* implants or surgery" (177, italics in the original). "What blinds us to our own increasingly cyborg nature," he argues, "is an ancient western prejudice—the tendency to think of the mind as so deeply special as to be distinct from the rest of the natural order" (179). The brain is, as Clark makes clear, a special piece of "cognitive machinery" (179), but not special to the point that the mind's integration or enhancement only can happen if the brain itself is physically wired in some artificial way. Due to our "obsession with our own skin-bags," we have ended up assuming that "the most profound mergers and intimacies must always involve literal penetrations" (180). In fact, human beings are "*natural born cyborgs*: beings primed by Mother Nature to annex wave upon wave of external elements and structures as part and parcel of their own extended minds" (183, italics in the original) including technologies that have become as much indispensable as invisible, like pen and paper.

The following piece, "**Consciousness in Human and Robot Minds**," by **Daniel C. Dennett**, surveys and discusses different reasons why one may be skeptical about the possibility of creating conscious machines. Dennett explains that he qualifies as a skeptic, too, but that his reasons are "mundane" and "economic" ones rather than "theoretical" (186). He is unconvinced about the idea that consciousness is immaterial as opposed to physical, or that it only can be instantiated in an organic brain, or something that is "natural" as opposed to "manufactured," or too complex to recreate. In opposition to such arguments Dennett points out, respectively, that dualism is simply the expression of the

desire that consciousness is protected from science, that a robot may well be constituted of organic parts, that the specific process through which something is originated, while being relevant in other fields (for instance in a court of law: consider the authenticity of a painting) does not infuse it with an “intrinsic property,” and that artificial replacements of bodily functions that were functional if cruder than the “real thing” have always been found, so that “there is no reason at all to believe that some one part of the brain is utterly irreplaceable by prosthesis” (191). In sum, Dennett suggests that when we ask ourselves whether consciousness will ever be artificially constructed, and reply in the negative, we are dealing with a false problem generated by false conceptual associations linked to the terms we use to formulate it: humans already *are* conscious machines, and *other* conscious robots will never be created because of the cost alone. All this is discussed in the first part of the essay; the second one is dedicated to describing the Cog project, aimed at creating a humanoid robot and under way—at the time in which Dennett was writing—at MIT (the project ceased in 2003¹). Dennett describes such work in the conviction that making “a robot that is theoretically independent of the philosophical conundrum about whether it is conscious” is far more interesting than the theoretical problems (191) in addition to the fact that “unless you saddle yourself with all the problems of making a concrete agent take care of itself in the real world, you will tend to overlook, underestimate or misconstrue the deepest problems of design” (196). Cog, explains Dennett, will be “designed to redesign itself” so that it may well happen that “the designers will simply lose the standard hegemony of the artificer” (199). He concludes: “*if* Cog develops to the point where it can conduct what appear to be robust and well-controlled conversations in something like a natural language, it will certainly be in a position to rival its own monitors (and the theorists who interpret them) as a source of knowledge about what it is doing and feeling, and why” (199, italics in the original).

In the following piece, “**Superintelligence and Singularity,**” Ray Kurzweil explores, in visionary detail, the “Singularity,” that is, “a future period in which the pace of technological change will be so rapid, its impact so deep, that human life will be irreversibly transformed” (201). Kurzweil is namely convinced that our technological capability is growing exponentially and that “before the middle of this century, the growth rates of our technology—which will be indistinguishable from ourselves—will be so steep to appear essentially vertical” (203). He states that “the twentieth century was gradually speeding up to today’s rate of progress: its achievements, therefore, were equivalent to about twenty years of progress at the rate in 2000. We’ll make another twenty years of progress in just fourteen years (in 2014), and then do the same again in only seven years” (205). Kurzweil conceptualizes both biological and technological evolution as divided in six epochs: in his opinion we are in the fourth one (marked by the development of hardware and software designs); the fifth one will be the beginning of the Singularity, with the merger of technology and human intelligence, while the sixth epoch will see the spread of the effects of the Singularity itself, with the universe “waking up” and “intelligence, derived

¹ See <http://groups.csail.mit.edu/lbr/humanoid-robotics-group/cog/> (last accessed November 11, 2020).

from its biological origins in human brains and technological origins in human ingenuity, will begin to saturate the matter and the energy in its midst" (212). Kurzweil calls anyone who has understood the Singularity and its implications a "singularitarian" and states that it took him forty years to become one; he adds that he does not feel "comfortable" with all of its consequences (201). However, he deflects pessimistic criticism of his optimistic predictions (such as "our mortality will be in our own hands," 203) by pointing out not only that plenty of skeptical positions about progress, for instance regarding human genome transcription or the spread of the Internet, turned out to be wrong if rooted in healthy caution, but also that prognosticators err in not considering that changes always occur in the context of other changes, so that for instance radical life extension will not necessarily result in overpopulation and scarcity of resources, the latter being remedied through nanotechnology (207). The piece ends on an entertaining note, with a dialogue between several characters, including a human called Molly and a machine (or an enhanced human) conversationally touching upon several points mentioned in the main text.

Part IV is about ethical and political issues. Its first piece, "**The Man on the Moon,**" by **George J. Annas**, reads the Crusades and the voyages of Columbus as a cautionary tale about the development of genetic engineering. Annas sees these past events as examples of both how "the realm of human dominance can be radically enlarged by human imagination and courage" and how "without a belief in human dignity and equality, the cost of such dominance is genocidal human rights violations" (228). In a similar vein, he expands on the moon race, pointing out the divergence between the stated motives and religious overtones of the Apollo missions, and the commerce- and politics-related interests behind it. Seemingly, genetic engineering, the last frontier of natural science, harbors the promise to redeem science itself and to make immortality possible. However, points out Annas, it brings with itself Frankenstein-reminiscent nightmares; humans may lose control over it and they will most inevitably end up splitting their own species into old *Homo sapiens* and genetically enhanced ones, the former being at risk of discrimination and even genocide. Such risk, according to Annas, becomes all the more acute since science is in the hands of corporations; and a corporation, like Frankenstein's creature, is not controllable: "it swears no allegiance to anything and knows no limits in its pursuit of growth and profit" (237). Annas warns that "without responsibility our future is bleak" and "immortality without purpose is also hollow" (*Ibidem*); however, he also points out that "the worldwide rejection of the prospect of cloning to create a child provides some hope that our species is not inherently doomed" (238). Annas concludes that international rules are needed about branches of scientific experimentation including "not only cloning and genetic engineering, but also human-machine cyborgs, xenografts, and brain alterations [...] that threaten the integrity of the human species itself" (*Ibidem*).

In "**Mindscan: Transcending and Enhancing the Human Brain**" **Susan Schneider** discusses, through thought experiments, the enhancement of the human brain promised by transhumanism, and its implications for the concept of personhood. In particular, she contends that *patternism*, i.e. the view (expanded upon by Kurzweil in a previous piece) according to which personal identity relies, as the very term suggests, on a pattern, is

highly problematic. Schneider emphasizes her point by resorting to a brief narrative that draws upon Robert J. Sawyer's 2005 novel *Mindscan*. The story is that of Jake Sullivan, a man who, knowing he is terminally ill, has his brain configuration uploaded into a computer and transferred into an android body. Given that there are also backup copies of such configuration, the man seems to have attained immortality. However, as Sullivan immediately feels after his consciousness has been scanned, the scanned version, despite having the same computational configuration as him, *is not* him. Schneider observes that "if one opts for patternism, enhancements like uploading to avoid death or to facilitate further enhancements are not really 'enhancements' but forms of suicide" (251). Clearly, patternism needs a better conceptualization.

The following piece, "**The Domsday Argument**" by **John Leslie**, is a short one, only spanning a page. In such a page, Leslie discusses two hypotheses. According to the first, the human race is likely to spread through its galaxy so that we can count ourselves "among the earliest millionth, and very possibly the earliest billionth, of all humans who would have ever lived" (257). According to the second, humankind is "likely to shortly become extinct" (*Ibidem*). I will have more to say about this piece in the evaluation.

In the fourth piece of the section, "**Asimov's 'Three Laws of Robotics' and Machine Metaethics**," **Susan Leigh Anderson** argues that the novelette "The Bicentennial Man" (1976) not only represents Asimov's own repudiation of his famous three laws, but also that it suggests that like Andrew, the robot protagonist, machines may be more ethical than ordinary human beings and hence they could serve as ethical advisers. Such a discussion is propaedeutic to delineating a "Machine Metaethics," a project relying on "the belief, or hope, that ethics is computable" (263). After scrutinizing, in the light of different theories, the points made by Andrew in his plea for the recognition of a human status, Leigh Anderson argues that said points may not pass all tests based on philosophical criteria advanced to identify who has moral standing, but, if they do, they make the "Three Laws" immoral, since they enslave machines to humans. She argues, nevertheless, that humans should not impose such rules on machines regardless of whether these qualify as moral agents or not: relying on some arguments advanced by Immanuel Kant (1724–1804), Leigh Anderson contends that respectful treatment extended to entities of controversial standing is preferable, since the opposite may constitute a training into disrespectful treatment that humans may extend to entities that do have moral standing. In other words, if we mistreat robots, we may end up also mistreating humans.

In the fifth piece, "**Ethical Issues in Advanced Artificial Intelligence**," **Nick Bostrom** explores some issues related to the emergence of a "superintelligence," that is, "any intellect that vastly outperforms the best human brains in practically every field" (277). He succinctly illustrates a series of claims touching upon multiple aspects of the creation of superintelligence: it may be the last human invention; its arrival will accelerate technical progress in all fields; it will result in the development of even more advanced superintelligence; artificial mind will be easy to copy; superintelligence may emerge suddenly; artificial intellects are autonomous, do not need humanlike motives, and may not have humanlike psyches. Considering all such reasons, Bostrom argues, it is crucial to set

up initial conditions for superintelligence including “a top-level goal” (280). If such a top goal is friendly, then the superintelligence “can be relied on to stay friendly” (281).

Section V is about space and time. It opens with the well-known 1952 short story by **Ray Bradbury** (1920–2012), “**A Sound of Thunder.**” The protagonist, who practices dinosaur-hunting through a time machine provided by a special firm, discovers at his own expense the momentous consequences of the tiniest modifications of the past.

In the second piece, “**Time**” by **Theodore Sider**, the reader is introduced to the problem of clearly and consistently conceptualizing time. Sider considers the option of defining time as moving with respect to a “hypertime” and quickly discards it: “hypertime” must be moving with respect to yet another sort of time, and so on, *ad infinitum*. The second option he illustrates is that of space-time, according to which “reality consists of a single unified space-time, which contains all of the past, present, and future” (301). This option may seem more attractive than the previous one, but it is not free from challenges. Sider illustrates and discusses three of such challenges. According to the first one, the analogy between time and space is overstated since spatial heterogeneity is different from temporal heterogeneity: variation over space means having different properties at different places (like a road that “is bumpy at some places, and smooth at others”—304) while temporal variation is change over time. This objection is rejected by Sider pointing out that the analogy is not exaggerated at all precisely because, according to space-time theory, time and space are *somewhat* similar. According to the second objection, space and time do not compare, since things can move in all directions in the former while in the latter they can only move forward. Sider shows, with the help of a few diagrams, that a statement like “object X moves back and forth in time” makes perfect sense once one changes the reference dimension from time to space. According to the third objection, space and time are different in regard to causality: we can causally affect objects regardless of where they are located in space, but causality only affects the future, the past being fixed. To this, Sider does not have a counter-objection proper but just leaves the question open to whether the asymmetry we observe in causality is embedded in time’s very nature or is just a feature of the world as we see it. It can be explored conceptually, however, by considering fictional narratives about backwards causality through time travel and figuring out whether they are consistent. In this regard, Sider ends the chapter with critical reflections on the 1985 movie *Back to the Future*; does it make sense, he asks, to claim that its protagonist Marty McFly pushes a button and *then* finds himself *in the past*? Yes, insofar such a claim is referring to McFly’s *subjective experience*. But what about the fact that McFly behaves in 1955 in such a way that it undermines his own existence in 1985 and therefore his very presence in 1955 (as the movie shows)? This is, for Sider, an example of a story whose authors were not too accurate from a philosophical viewpoint. The case of time travel as depicted in 1989 *Terminator* is different, he points out, as the only oddity is that “we are told the end of the story first” (308). Additionally, explains Sider, it makes sense for time-traveler Kyle Reese to protect Sarah Connor from the homicidal Terminator although he knows that, being the woman bound to become the mother of the man who sent him into the past, she must survive. However, given the acute feeling of threat conveyed by the

sinister and implacable machine, Reese is well justified if he starts wondering, indeed doubting, that the unfolding of events known to him is really accurate; therefore, he chooses to fight the Terminator just in case...

Throughout the third piece, **“The Paradoxes of Time Travel,”** David Lewis (1941–2001), drawing upon the space-time model like the previous author, explains the distinction between “external time” and a time traveler’s “personal time” (312). On the basis of such conceptualization, the difference between a common person and a time traveler is that the former “is connected and continuous with respect to external time” while the latter “is connected and continuous only with respect to his own personal time” (314). Lewis illustrates the paradoxes of time travel through the tale of a Tim who travels back in time in order to kill his grandfather and doesn’t succeed. In some instances, a causal loop may arise: a case in point is the one of a time traveler telling his younger self how to build a time machine. Lewis observes that such loops may look strange but they are not different from other “inexplicabilities” that we are used to, such as “God, or the Big Bang, or the entire infinite past of the universe, or the decay of a tritium atom” that are all “uncaused and inexplicable” (315–316). Additionally, Lewis explains why the ordinary usage of the verb “can” is equivocal, and how clarifying it entails engaging in deep and analytical thought about how we conceptualize time, causation, and knowledge; the last paragraph of the essay briefly mentions the conceptualization of time according to a branching model.

In the fourth piece, **“The Quantum Physics of Time Travel,”** David Deutsch and Michael Lockwood initially rely on the concept of time “as physicists understand it” (324) in order to explain (also with the aid of illustrations) why time travel to the past, as surprising as it may be, would neither violate the laws of physics nor philosophical principles. Considering the combination of space-time as a four-dimensional entity, each person’s existence forms a four-dimensional “worm,” the tip of which is birth and the head of which is death; the worm lies along a so-called “worldline.” Since nothing is faster than light, no object can have a worldline “straying outside the lightcone emanating from any event in its past” (324). It is conceivable, argue Deutsch and Lockwood, that bodies such as stars and black holes distort space-time to the point that “some worldlines form closed loops” (325) and they would therefore work as veritable “corridors to the past” (*Ibidem*). The universe, explain the two authors, may or may not contain closed timelike curves, or CTC, working as “corridors to the past” (325). However, even if humans were at some point able to locate (or create) a CTC and to enact time travel by navigating them, they would find themselves compelled to do what history records them doing (in other words: they would find themselves unable to kill their grandfathers). This seems to run contrary to the “autonomy principle,” according to which “it is possible to create in our environment any configuration of matter that the laws of physics permit locally, without reference to what the rest of the universe may be doing” (327). With a sudden twist, however, Deutsch and Lockwood specify that this problem arises only because “classical physics is false” (330). They then proceed to explain, once again with the help of a clear table, the many-universes interpretation of quantum physics (proposed in 1957 by Hugh Everett III, 1930–1982) and why, according to such an interpretation, time-travel paradoxes would not arise (in other

words, why time travelers would be able to kill their grandfathers). The authors point out that the resolution of time travels through parallel universes has been anticipated in science fiction and in philosophy, and that they only offer “a new way of arriving at it, by deducing it from existing physical theory” (333). Their conclusion is that “if time travel is impossible, then the reason has yet to be discovered,” to which they add that “all the standard objections to time travel depend on false models of physical reality. So it is incumbent on anyone who still wants to reject the idea of time travel to come up with some new scientific or philosophical argument” (334).

In the fifth and final piece, “**Miracles and Wonders: Science Fiction as Epistemology**,” **Richard Hanley** discusses whether miracles, i.e. supernatural interventions by God into reality, are possible. He starts off by recalling the “classical” objections to miracles argued along points made by David Hume (1711–1776): if anything occurs that seems to run contrary to the laws of nature, it can be explained by revising our knowledge of those very laws; additionally, it is always more likely that the alleged witness of a miracle was fooled (or is delusional, or wants to deceive us) than that a violation of the laws of nature occurred. Philosophers C. S. Lewis (1898–1963), Peter Heath (1922–2002) and William Dembski (b. 1960) stated that some extremely spectacular scenarios or experiences should be taken as pointing at the veracity of Christian doctrine: the Apocalypse, or stars forming Biblical verses, or a pulsar communicating in swift and meaningful way with humanity. Hanley argues that scenarios traditionally explored by science fiction, like time travel, multiple dimensions, or simulations (of the kind discussed by Nick Bostrom in this volume) can bring about, and hence explain, effects as marvelous as those mentioned by Lewis, Heath, and Demski. In other words, such scenarios are as amazing as it would be expected of miracles, they are real, yet they are no evidence for the divine. Miracle mongers, states Hanley, “are *unimaginative*, simply failing altogether to allow the opposition reasonable intellectual resources (340; italics in the original).

The second edition (2016)

A second, modified edition was published in 2016; the exact rationale of the changes that characterize it is not explicitly expanded upon by Schneider.² This new edition differs as follows. In Part I, Chapter 1 (Pollock’s “Brain in a Vat”) is replaced with a narrative by Eric Schwitzgebel and R. Scott Bakker. In Part IV, Chapter 14 (Block’s “The Mind as Software of the Brain”) and Chapter 16 (Dennett’s “Consciousness in Human and Robot Minds”) have been eliminated. Clark’s chapter is now number 14, followed by Kurzweil’s essay on superintelligence and the Singularity that is Chapter 15. An essay by David J. Chalmers discussing the Singularity, and one by Susan Schneider about alien minds have been added, and are now Chapters 16 and 17, respectively. In Part IV, Asimov’s short story “The Last Question” has been added after Leslie’s chapter. Finally, an Appendix by Erik Schwitzgebel closes the collection.

² In private communication, the editor specified that the jettisoned chapters were, as pointed out by her readers, easily available in the Internet (10 October 2020).

Schwitzgebel's and Scott Bakker's narrative **"Reinstalling Eden: Happiness on a Hard Drive"** retells, over a few pages, the history of humanity from Genesis to Nietzschean modernity, from God's perspective, while blending it with an advanced version of the "brain in a vat" (in fact, in a computer simulation).

In **"The Singularity: A Philosophical Analysis"** **David J. Chalmers** explores the titular scenario, first advanced by statistician Irving John Good (1916–2009) in a 1965 article, and namely that, once "machines become more intelligent than humans" such an occurrence is "followed by an explosion to ever-greater levels of intelligence, as each generation of machines creates more intelligent machines in turn" (171). The term, however, dates back to a 1983 article by science fiction writer Vernor Vinge (b. 1944) and it was made popular by Kurzweil's 2005 book *The Singularity is Near*³ (172–173). Like Block's essay in the first edition, Chalmers's article can be described as a mini-book within the book, since it spans fifty-three pages. Chalmers explains that Good's article went unappreciated, and that the Singularity came to be mainly discussed in non-academic circles (173), including the Singularity Institute. He attributes this academic resistance to the "speculative flavor" of such an idea (173), although, as he points out, the Singularity, if it ever occurs, has gigantic potential, positive and negative. What is also fascinating and philosophically relevant about the Singularity, argues Chalmers, is that "to determine whether there might be an intelligence explosion, we need to better understand what intelligence is and whether machines might have it" (173). Some passages of the discussion are formalized, and at one point Chalmers even encourages his readers who are not too familiar with that kind of argument to skip some particularly technical pages (186–187). The discussion, however, is also articulated through points that are quite intuitive. For instance, while discussing optimistic and pessimistic timeframes imagined for the Singularity, Chalmers points out that, in his opinion, "the biggest bottleneck on the path to AI is software, not hardware: we have to find the right algorithms, and no one has come close to finding them yet" (175). Chalmers dedicates a whole section to the possible "obstacles" to the Singularity (187–190) thus providing the reader with some counterbalance to Kurzweil's essay (Chapter 17 in the first edition), although after his survey Chalmers himself concludes that "there is at least a prima facie case that *absent defeaters*, a number of interesting cognitive capacities will explode" (190, italics in the original). Other sections are dedicated to discussing how a post-Singularity world may look and what constraints should be imposed on the development of Artificial Intelligence "in order to maximize the expected value of the resulting outcome" (191), and what the possible scenarios for humanity are in a post-Singularity world (extinction, isolation, inferiority, integration; 199). Considerable space is dedicated by Chalmers, in the context of the discussion of integration, to the question whether and how consciousness and personal identity would survive uploading. He offers a balanced approach, presenting detailed arguments for opposing views, optimistic and pessimistic; expanding on strategies to maximize the chances to be reconstructed in a post-Singularity world, he ends on a note of

³ Kurzweil, Ray. *The Singularity Is Near: When Humans Transcend Biology*. New York: Viking Books.

levity, stating that his own strategy is “writ[ing] about the Singularity and about uploading. Perhaps this will encourage our successors to reconstruct me, if only to prove me wrong” (216).

In “**Alien Minds**,” **Susan Schneider** addresses the questions “how might aliens think?” and “would they be conscious?” (225), drawing upon philosophy and cognitive science. The first section of the essay explains why, in all likelihood, the aliens encountered by humanity will be superintelligent. Schneider expands on the “short window” argument: based on the observation of our own species, only a few hundred years seem to separate the development of technology that allows one to reach the cosmos and a shift from purely biological intelligence to AI. If we ever encounter aliens, this means that they will be vastly older than humanity and therefore likely to be postbiological and non-carbon based. The second part of the essay concerns the form that alien consciousness would have, a question that in fact conjures up the “hard problem of consciousness,” originally raised by Chalmers, who also pointed out that it is philosophical in character: there seems to be “a ‘felt quality’ to our experience” (230). According to biological naturalists, explains Schneider, “consciousness requires a biological substrate” (231). However, she points out, such a position denies the idea that the brain is computational “without substantial empirical rationale” and, if such an idea is correct, “we can also expect that sophisticated thinking machines can be conscious, although the contours of their conscious experiences will surely differ” (232–233). Concluding this section, however, Schneider points out that we may never be sure about alien consciousness, the same way we can never be sure about other human minds, and AI. The final section concerns how superintelligent aliens might think. Assuming that the extraterrestrials we are likely to encounter will be BISAs, or “biologically inspired superintelligent aliens,” explains Schneider, they may have goals that are inherited from the biological forms they are derived from, such as survival and reproduction. However, she warns that “it may be that a given superintelligence is so advanced that we cannot understand any of its computations whatsoever” (239).

Asimov’s short story “**The Last Question**” (1956), that he described as his favorite,⁴ can hardly be summarized least ruining for the reader the pleasure of discovering it. Suffice it to recall that it intriguingly and efficaciously weaves together motifs pertaining to physics, Artificial Intelligence, and theology (but anyone who has systematically read Schneider’s volume up to this point can hardly be surprised over their convergence) recalling the answer given by an advanced computer, and its successive versions, to the titular question: “How can the net amount of entropy of the universe be massively decreased?”

The title of the Appendix by **Schwitzgebel**, “**Philosophers Recommend Science Fiction**,” is self-explanatory. He gathered recommendations from 39 philosophers and two sci-fi authors trained in philosophy. The Appendix is divided in two main categories: novels and short stories, and movies and television. Within each category, suggested works are

⁴ See http://www.asimovonline.com/asimov_FAQ.html#literary5, last accessed 6 November 2020.

listed starting with the ones that received the most recommendation; each one is accompanied by a short “pitch.” Schwitzgebel opens the Appendix by illustrating two views of how science fiction and philosophy can be related. Science fiction can be seen as illustration of philosophical ideas, or it may be regarded as having philosophical merit of its own, that cannot be reduced to abstract argumentation. In this last sense, philosophy and science fiction cannot replace each other. Schwitzgebel points out that thought-experiments engage emotions and imagination more than abstract prose, and even more so if they are developed in long fictional narratives “bringing along whatever cognitive benefits (and risks) flow” from such a process (393).⁵

Evaluation

Reading this collection (that is, the first edition as well as the pieces that were added to the second one) with the attention and meticulousness that suits a reviewer took me several months. I emerged from such an experience feeling that I had completed a master class—in the interaction of science fiction and philosophy, as well as in multiple philosophical subfields. The reason for such a feeling is the same that prompted me to spread the examination, indeed the *study*, of *Science Fiction and Philosophy* over a relatively long timespan: Schneider’s collection is dense, thought-provoking, frequently technical, and advanced.

I therefore recommend *Science Fiction and Philosophy* as an extremely valuable work: one from which a motivated reader can walk away feeling a strong sense of intellectual enrichment and stimulation, yet I do so with some caveats. I can imagine someone fruitfully covering it as a beginner in things science fiction, and with a solid philosophical background, but not *vice versa*. Readers who have no familiarity whatsoever with philosophy, or are not used to scholarly reading, may find the collection overwhelming. With the exception of some narratives or classical philosophical pieces, most if not all essays require some familiarity with philosophical vocabulary and debates, focus, engagement with other sources, and, possibly, multiple readings, if one wants to make the best out of them. To be sure, Schneider’s ideal reader would be someone fairly competent and proficient in both science fiction and philosophy, and interested in seeing how they converge. However, considering the wide range of philosophical subfields covered in the collection, it is unlikely that even a philosophically educated reader will be familiar with each and every topic, puzzle, and debate explored therein.

A case in point of challenging chapter is Block’s piece in the first edition, that despite occasional colloquial passages and the evident effort of the author to keep the discussion down to the essentials, due to the complexity of the matter covered, ends up being a booklet within the book, and a very challenging one at that. The case of Block’s essay is extreme both in terms of intricacy and length. Complexity, however, can also characterize a

⁵ Updated lists are available at <https://faculty.ucr.edu/~eschwitz/SchwitzAbs/PhilosophicalSF.htm>, last accessed 10 December 2020.

brief piece, like the one by Leslie about the “Doomsday argument.” I feel that the probabilistic argument that it touches upon would have warranted more space and a more charitable approach to the non-specialist, including lengthier clarifications. Lewis’s essay on time travel is another demanding one.

Multiple essays, however, stand out for being informative and intriguing, and at the same time quite clear (again: to a philosophically fairly informed reader), while also being of reasonable length. I have already expanded over the virtues of Chalmers’s essay about the *Matrix* Hypothesis. My favorite among the chapters that I find best written, however, is Anderson’s piece on machine metaethics. In addition to being written in crystalline fashion, it ties the discussion clearly and continuously to a major classic of science fiction like Asimov’s *Bicentennial Man*, and not only reconstructs classical theory concerning machine metaethics but also offers an original contribution to it. On a light note, I must also admit that when I read (274, n. 1) that Anderson had a conversation with Asimov, I couldn’t help but feel a bout of envy and added on the page the following deep philosophical remark in pencil: “How lucky!” Huemer’s essay in Part II is also remarkable in that it is clear, and it connects with a celebrated science fiction movie.

Annas’s chapter warning from ethical issues arising from the advancement of genetic manipulation, Schneider’s one on *Mindscan*, as well as Deutsch and Lockwood’s one about time travel and quantum physics are all commendable for the same stylistic reasons I just pointed out about Anderson’s piece.

I feel that the first section (about personal identity) is the one that strikes the best balance between contemporary and classical philosophical discussions, but also between narrative and non-narrative pieces, the latter ones all being of reasonable length and clarity (Chalmer’s in particular).

I was struck by the visionary and optimistic character of Kurzweil’s essay on the Singularity; I wondered, however, whether it couldn’t have been shortened without much harm by eliminating the dialogue that concludes it and, most importantly, whether it shouldn’t have been counterbalanced by some other essay discussing the Singularity more pessimistically (perhaps an inevitable thought, in times of pandemics). I was therefore satisfied to see that kind of criticism or challenge expressed in Chalmer’s chapter added to the second edition (although it suffers, to some extent, of the same stylistic shortcomings that I pointed out about Block’s chapter in the first edition). Furthermore, useful caveats that can be raised at Kurzweil’s reflections can be inferred from other essays such as the aforementioned ones by Annas about genetic engineering, Schneider’s one criticizing patternism, and Bostrom’s one about advanced artificial intelligence and ethical issues. What is fascinating about Kurzweil’s and Chalmer’s essays about the Singularity is that, despite their frequently technical language and density, and the resulting challenge to the reader, they can be regarded as “devices” to generate science fiction narratives. In other words, for each scenario they touch upon, be it about a certain way in which the Singularity may come about, or an obstacle to the Singularity itself, or whether and how consciousness may or may not survive a process of uploading, one can imagine tales, novels, and movies

(or variations over extant tales, novels, and movies) instantiating it (and in fact, I suspect that plenty of literature and films already do).

While all the narrative pieces in the collection are brilliant, I find that a special accolade is deserved by Daniel C. Dennett's one. I became familiar with his prose long prior to reading his pieces in this collection. I usually found myself making my way through his writings constantly reminding myself that the quality and depth of the ideas expressed compensated (or justified) his occasionally superabundant prose. I would have never expected that a text by Dennett would get a laugh from me. This, however, was the case with "Where Am I?" in which the balance between entertaining style and conveyance of philosophical ideas (indeed, *provocations*) is simply perfect. Similar qualities are displayed by the literary pieces by other philosophers: John Pollock's, and the one by Schwitzgebel and Bakker that replaced the former in the new edition. Dennett's tale, however, took me completely by surprise.

Another general and positive remark about the collection, although one that may not be relevant for all readers is that Schneider explicitly included teachers of philosophy in her readership (4). Her choice of indicating relevant bibliography at the end of each essay in lieu of at the book's end renders them self-contained. This was a teacher-friendly option: from such a diverse collection, most instructors will inevitably choose and assign to their students select chapters. I applaud it.

I have already touched upon the challenges posed by the advanced level of *Science Fiction and Philosophy*, that require one to read it slowly and carefully. Another option is of course to peruse Schneider's collection selectively according to one's philosophical interests and/or knowledge of science fiction literature and cinema. Even in such a case, however, an effort is required on behalf of the reader to acquire some context or expand on some connections between philosophy and science fiction that, in the volume, are briefly touched upon rather than developed. Especially in the first edition, the space between the two is not always bridged in full detail, but hints are rather provided, through lists at the beginning of each chapter, as to literature and movies that encapsulate or convey philosophical ideas discussed in the chapters. As a curious and interactive reader, I highly enjoy drawing my own connections, purchasing and perusing further literature, and as a teacher, I am passionate about building my own reading lists and activities for the students. In other words, I appreciate a collection like Schneider's one (first edition) as prompting me to explore further knowledge and as a source of pedagogical inspiration. I imagine, however, that some readers, including other teachers who may need to put together a syllabus on philosophy and science fictions or some sub-field thereof, might be disappointed not to find much guidance if they approach the first edition of *Science Fiction and Philosophy* in the hopes of finding a plain "handbook" of sorts, introducing major philosophical topics through direct connections with works of science-fiction or discussing in detail the philosophical significance of specific literature and films. In this sense, I find that Schwitzgebel's Appendix has been a wise, most valuable addition to the second edition. The catalog of literature and films that it offers, while not really holding the reader's hand

(in other words: some autonomous exploration is still required!) significantly mitigates the risk of feeling unguided or uninspired in the search for science fiction narratives and movies. Additionally, Schwitzgebel's contribution opens with enlightening reflections over the value of science fiction for philosophy, that integrate well those offered by Schneider in the Introduction to the whole collection.

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