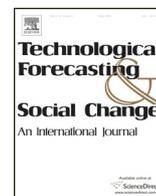




Contents lists available at ScienceDirect

## Technological Forecasting &amp; Social Change



## Power and politics: A threat to the Global Brain

Forrest Rosenblum

518 40th, Street Oakland, CA 94609

## ARTICLE INFO

## Article history:

Received 30 September 2015  
 Received in revised form 21 June 2016  
 Accepted 30 June 2016  
 Available online xxxx

## Keywords:

Human metasystem  
 Superorganism  
 Global Brain  
 Cultural evolution  
 Omnibenevolence

## ABSTRACT

This paper seeks to reaffirm human kind's status as a superorganism, or what the paper will later call a social organism that operates as a biological individual. As such, the paper recognizes the existence of the Global Brain and its great potential to help organize our social organism into a more coordinated, more efficient, more democratic, and more collectively potent entity. This potential lies in its ability to foster more numerous and more diverse communications between both humans and technology, and then better link those communications to mechanisms of action. However the Global Brain remains just that: a potential. Power dynamics around the world continue to yield very much influence to a very small percentage of the population. Not only does this reality cause poor collective decisions to be made which is dangerous in its own right, but it also threatens the possible emergence of a true Global Brain that effectively coordinates a global society. It's the goal of this paper to highlight that danger we are facing and suggest a course of action that intentionally applies the Global Brain concept to reform the way our communities share information and make decisions in order to realize its dream.

© 2016 Elsevier Inc. All rights reserved.

## 1. Introduction

As a collective, or set of collectives, it is no secret that human society at all levels faces many problems that can only be tackled with cooperation in and between groups of individuals. Due to the global nature of today's world, there are many issues that require collaboration between very geographically and culturally distinct groups. Such problems include but are not limited to: uncontrolled climate change, vast poverty, and a variety of wars with many global causative factors. Prior to best deciding upon the best methods by which these problems might be solved, an understanding of what human society actually *is* must be reached. Such an understanding will illuminate our strengths and weaknesses and indicate ways that we might be able to increase our collective ability and efficiency.

For a starting point towards improving the human condition, this paper champions the idea of society as a *vast planetary superorganism*. This vision both reinforces our collectivity and points a finger in the direction of potential solutions to our problems. These solutions rely upon the ability of an advanced "Nervous System" for the superorganism that will be able to effectively manage problems that society faces in its environment. This new nervous system, based on expanding and advancing information and communication technologies (ICT) has already transformed our world and promises great things for the future.

A vulnerability to the superorganism's evolution arises based on the central role that information and communication play. Specifically, it is the danger that the current power brokers in the world today will be averse to changes that will arise in society's structure as we continue to evolve. If not resisted, these elements of society may be able to halt the superorganism's progress, or slow it down enough to significantly damage ourselves and our planet. After further detailing this problem, a methodology for scholarship and action will be proposed that could be hugely important in assisting the superorganism's development.

## 1.1. Humanity as a superorganism

The idea that society functions as a superorganism put forth in detail first most notably by [Spencer \(1860\)](#), later modernized by [Stock \(1993\)](#), and since elaborated upon by [Heylighen \(2007a\)](#) and is now a relatively widely known interpretation of our species. The numerous analogies between society and those things that have been historically accepted as discrete organisms are vast, but need not be enumerated in depth again in this paper. A healthy debate has raged over the past several decades whether or not such collections of individuals should be elevated to the point where they are actually considered a new type of organism. These debates have focused largely on what the appropriate unit of evolutionary selection is, and whether or not arguments by analogy are enough to validate superorganisms' existence. Important are the arguments made by [Haber \(2013\)](#) who defends the concept of the superorganism by strengthening both strains of argument. While Haber's paper focuses on the status of insect colonies and did not make mention

E-mail address: [flr@bu.edu](mailto:flr@bu.edu).

<http://dx.doi.org/10.1016/j.techfore.2016.06.035>  
 0040-1625/© 2016 Elsevier Inc. All rights reserved.

Please cite this article as: Rosenblum, F., Power and politics: A threat to the Global Brain, Technol. Forecast. Soc. Change (2016), <http://dx.doi.org/10.1016/j.techfore.2016.06.035>

of human society, it will for now be accepted that his arguments may be reasonably extended to “human colonies,” though this extension is not trivial.

Regarding the “unit of selection approach,” this paper will follow the approach of Haber (2013), Wilson and Sober (1989), and Hölldobler and Wilson (2009 pg. 24–29) that states that three levels of selection can be in play at once. There is the level of the gene which says, more so than individual organisms, it is the genes that compete for survival. Those genes whose phenotypic manifestations help the genes to get passed on are the genes that are selected for. This theory was most famously championed by Dawkins (1976). Next, there is the level of the individual organism which is the focal point of traditional Darwinism, and finally the level of the group. Group level selection states that competition between groups can appear, and traits that allow for the survival of the group can, in certain circumstances, be selected for. This acknowledgement of three selection levels and their interplay ultimately leaves the door open for groups of individuals to evolve as one and develop the functional organization that is often used to characterize organisms.

Haber goes on to address the weakness of “similarity arguments” by rightly stating that ahat discussions over whether or not colonies of individual organisms should be considered “organisms” or “superorganisms” in their own right have fallen prey to “category error.” He insightfully realizes that *there is no “paradigmatic organism” by which a “colony-individuals (i.e. superorganisms)” can be judged.* Organisms vary widely in the natural world and attempting to evaluate a colony against such a loose conception is unproductive. Instead, he argues that it is enough to acknowledge colonies’ biological properties in their own right. By doing so, Haber releases the baggage associated with the terms “organism,” “colonies,” and “superorganisms. Haber goes as far to call for these term’s abolishment, but to remain consistent with a majority of relevant literature this paper will continue to use the term “superorganism” with the understanding that it is merely a subcategory of the term “organism.”

### 1.2. The power of symbolic information

The human superorganism has been shaped by the forces of cultural evolution (Last, 2015a), a process dependent upon the creation, storage, manipulation, and transmission of symbolic information. Remarkably, culture has proven capable of forming complex systems of organization called “metasystems,” entities first described by Turchin (1977) and later well enumerated and defined by Last (2015b). A metasystem is a biological level of systemic organization. These organizations have been seen to transition from one stable to state to the next in what Last calls a “Metasystem Transition.” Examples of these include the evolution of single to multicellular life, and single organisms into the very colonies that this paper has accepted as “superorganisms.”

Last argues that, via techno-cultural evolution, human society has already undergone metasystem transitions to higher levels of organization. These stages largely follow the traditionally accepted phases of human organization from band/tribes to chiefdoms, from chiefdoms to kingdoms, and from kingdoms to the nation state. (Last, 2015a) Last’s Information Energy Metasystem Model (IEMM) states that human metasystem transitions occur when humans are able to harness new energy sources and manage them with new levels of informational control. Not only is the idea of humanity as a superorganism defensible and compelling, but it is powerful. This view along with the IEMM predicts that we are on the verge of a major transition in which digital information and renewable energy sources will allow for a new level of human organization and bring about a new, radically different phase of organizational stability in society.

The success of the next human metasystem lies largely on the shoulders of what has been termed the “Global Brain” (Goertzel, 2002; Heylighen, 2007a). The Global Brain is a phenomenon that could be said to exist in all phases of human evolution, though before now on a

limited scale. It can be understood most basically as a system of human collaboration that allows for collective intelligence and advancement. It is now growing rapidly to a critical point due to the expansion of information and communication technologies ICT. Such advances are allowing for far more numerous, more varied, and more documented interactions. The Global Brain’s power lies within its ability to leverage information to make informed decisions regarding the Earth’s resources. Important in these advances are the “Network of Things,” Artificial Intelligence, and other such technological advances. Unique to the Global Brain, however is the central position that *humans* play in this advanced vision of society, rather than visions that focus on the advances being made in artificial intelligence. As Heylighen states,

Just like the neural networks in our brain, the global network processes this information in a distributed manner, with billions of human and technological “neurons” working in parallel—on partly the same, partly different data—while aggregating their results into collective decisions and action. (2014).

This observation by Heylighen is not just an analogy. It is obvious that humans collectively are more intelligent than they are on their own. Each individual has their own knowledge and own perspective that they bring to the table when discussing a matter, and aggregating such perspectives can often lead to a richer, more informed discussion. Therefore, intelligence does not just stop within our heads but rather exists among us as we create, share, and store symbolic information. This paper acknowledges the potential of the Global Brain to incredibly increase our abilities by more closely linking our improved collective intelligence with machine intelligence.in an explosion that has been termed the “technological singularity” (Heylighen, 2014; Kaku, 2014; Kurzweil, 1999). With these increased abilities, the thought is that we may be able to transform our world into a successful and sustainable “utopia” in which our Superorganism prospers far into the future.

However, despite society’s advanced technological state, we are not there yet. Clifford Geertz (1973) once painted a compelling picture of human society and culture that still nicely illustrates the state of our superorganism.

The appropriate image, if one must have images, of cultural organization is...the octopus, whose tentacles are in large part separately integrated, neutrally quite poorly connected with one another and with what in the octopus passes for a brain, and yet who nonetheless manages both to get around and to preserve himself, for awhile anyway, as a viable if somewhat ungainly entity. (1973).

This imagery suggests the concept of humanity as one body, not yet fully grown or coordinated. Geertz’s ungainly octopus is still in many ways an accurate characterization of our world’s cultural state. Despite global flows of resources, information, and capital many communities remain greatly segregated and limited from one another, resulting in what Last has called a “Potemkin Village” (2015). The global Potemkin Village is characterized by global economic integration, but vast societal divides that keep us from having a stable, meaningful global community capable of addressing problems that face us all. Fortunately, the vastly expanding web of connections in our world (the global brain) appears to be capable of integrating the widely varying cultural currents into a coherent pattern, giving the properties of rhythm, coordination, and harmony to the way in which we interact with each other.

However, in order for a grand global society to truly emerge, our cultural information flows must be *actively* sorted in such a way as to achieve wide-scale coordination at both the local and global levels. As Last said, the mere increase in “information potentiality...requires a purposeful re-organization of that new potentiality” (2015) in order to achieve desired goals. There are at least two key aspects of the emerging human metasystem that will critically affect the system’s functioning and wellbeing. These aspects firstly has to do with the quality and quantity of the information transfers/cultural exchange. There must be a certain level of diversity and productiveness in the exchanges between humans in order for a *robust* and *coordinated* Geertzian octopus to emerge. The other critical aspect is the question

of which information is being linked to action, for it is not only the goal of a brain to process information but then send out signals to control the body and act upon the world around it.

### 1.3. A politically contentious road to paradise

In his paper “Return to Eden? Promises and Peril on the Road to a Global Superintelligence,” Heylighen lists four characteristics of the global brain that are theorized to potentially make for a utopian world. They are, in order, *omniscience*, *omnipresence*, *omnipotence*, and *omnibenevolence*. Heylighen argues well for the possibility of each of these but for now this paper will administer a closer examination of the fourth principle: omnibenevolence. The first three characteristics of the Global Brain will be achieved primarily through advancing technology. However, the pursuit of an omnibenevolent system has not just technological hurdles in its way, but massive socio-political struggles.

Heylighen presents socialist-leaning views that suggest the global brain will someday be able to optimize the distribution of resources via highly democratic, data driven processes resulting in vastly different flows of resources than exist today. (Heylighen, 2007a) Heylighen rightly states that the elite political and corporate class that currently possess the most power and access to resources will almost certainly oppose the idea of such changes. It's possible that, depending on the strength and coordination of countervailing centralizing forces, humanity could face a major crisis in the global brain's development. Last (2015a, 2015b, 2015c) acknowledges the danger posed by centralized power such as nation states and organizations like the NSA who utilize information not for decentralized democratic reform but quite possibly for the very opposite purpose. It should be understood that these same elite networks of people also have the greatest control of the powerful technologies of the Global Brain, a situation which threatens to derail the entire evolution of the human superorganism.

We must ask ourselves what could happen as the powers of *omniscience*, *omnipresence*, and *omnipotence* continue to grow but yet are largely controlled by a powerful few? Could the prospect of change be systematically hindered by using the nearly the very same methods as the idea of change can be systematically *accelerated*, as the global brain promises to do? Could such powers use their immense technological capabilities make a nearly unbreakable system that halts or greatly controls our cultural evolution? These questions must be asked and then addressed if humanity is to realize the promise of a Global Brain society.

The potential for a centralized power to perhaps induce a psychological parasite intentionally as to stunt creativity is well chronicled in human history. This paper follows on the propaganda media model put forth in “Manufacturing Consent” that “suggests that the “societal purpose “of the media is to inculcate and defend the economic, social, and political agenda of privileged groups that dominate the domestic society and the state” (Herman and Chomsky, 1988). Propaganda, both blatant and subtle, is alive and well today despite the massive amounts of distributed decentralized media allowed for by the Internet. The result is the admission that the development of the global brain has opponents, and it is locked in a global power struggle that has already commenced. A brief case study of the author's home country is good evidence of the vast and detrimental powers that currently powerful groups are willing to deploy to stunt new thought patterns and new organizations.

At first it may seem that the mainstream media in the United States is losing its stranglehold. After all, Pew recently polled that the percentage of Twitter and Facebook users who get news from the sites rose from 52%–63% and 47%–63% respectively from 2013 to 2015 (Barthel et al., 2015). In the same study, younger adults were found to place more reliance on Facebook and Twitter for news than older generations. Trends like these seem to imply that the traditional news media sources

are quickly and steadily losing grasp on the population of the US, which should result in bursts in political creativity.

Another statistic gathered by Pew might put a temporary hold on any celebrations. After Facebook, the most widely accessed news sources comes a list of major media names including CNN, local TV, ABC News, Fox News, NBC news, among others (Mitchell et al., 2015). The only standout from the rest of the list is Google News, which is not in itself a news source but largely an online platform that gives the choice between the aforementioned major sources. Facebook's place atop this list could be a glimmer of hope, though mainstream media sources have also a large presence on this site.

The presence of a range of news sources, “major” or not is not in itself a problem. Unfortunately for the United States, many of these sources are highly redundant, not to mention of a general low quality. It is estimated by Business Insider (2012) that 90% of the media consumed in the United States is controlled by 6 companies (Lutz, 2012). Many of the major US mainstream media outlets are sensationalist and driven by profits, and who will just as soon distract us as they will engage with an important issue. It is still highly difficult, therefore, to get societal scale discussions going that are not channeled through the obscuring lenses provided by so many of the media outlets. Such widespread lenses completely stifle the power of collective intelligence, as mainstream narratives dominate discussions in ways designed by those who construct the lenses.

Furthermore, even if major media outlets and centralized narratives are on the decline in the age of the Internet, *the freedom of information is not enough*. There *must* be power connected to discussions in communities so that collective intelligence may move into the realm of collective action. Potency is, as Heylighen notes, an important quality of the global brain. Therefore even if the outlook of the United States' collective intelligence is not actually as bleak as this paper's arguing it is, collective thought still would need to be more closely linked to collective action. The US government is notoriously unresponsive to the desires of “the people”, due largely to massive spending and lobbying that special interest groups use to infiltrate the governing process at all levels of the democracy. There is strong interest in *limiting* the link between collective sentiment and collective action.

Mother Jones reported that an estimated 28.1% of the money donated towards the 2012 US Presidential election was given by the 1% of the 1% (Kroll, 2013). The estimated cost of winning a seat in the US Senate in 2014 was \$9,655,660 and The House of Representatives \$1,466,533 (Anon, 2015a). Between private campaign donations and lobbyists, it is no secret that the US federal government is subject to many private interest groups' influence; groups led by a small circle of very wealthy individuals and organizations. The result is that the decision making bodies in the United States often make choices based on the desires of those few who spend money to support the politicians' careers rather than the majority of the people whom they are nominally elected to represent. This can be incredibly dangerous, not least of all for marginalized groups who are not well represented and the environment of Earth itself.

The United States is just one example of a region where this type of obstruction is rampant; there are many more extremes in more authoritarian countries all over the world. The Arab Spring, which was hailed as the distributed consciousness's victory over highly centralized authoritarian control, showed both that centralized power is incredibly difficult to dislodge, and that no distributed mechanisms had yet been developed for effective governance. What good is a Global Brain, if it has no global body through which to act?

The Corruption Perceptions Index of 2015 (Anon, 2015b) indicates that it is no great secret that tightly knit centers of power and information exist in abundance in societies all across the globe. However, despite the widespread awareness of these limited governing structures, it remains extremely difficult to shift society to a different model. Institutions inspired by the idea of a global nervous system and a superorganism represent the best chance to legitimately

reorganize these vital societal structures on account of their potential to be robust and powerful (thus has a vast practical appeal), the theoretical strength behind them (the strong arguments that humanity is a superorganism), and the inspiring imagery and passion that such a notion could ignite.

#### 1.4. What can be done

As just discussed, there exists deficiencies within our current global nervous system that must be addressed before a stable and healthy superorganism will emerge. Communities that share problems are far too isolated from one another which causes destructive feedback loops. Such isolated informational patterns result in prejudices, misunderstandings, and attitudes that are divisive rather than collaborative. Furthermore, even when there are constructive, creative interactions between disparate communities regarding challenges they face, too often these discussions do not result in the necessary action due to largely to exclusive and elitist decision-making apparatus.

To begin to solve these problems, one must view society through the lens of the Global Brain as a Superorganism. A Global Brain Anthropology must be undertaken that studies communities in terms of their informational flows. Mapping who talks to whom and media channels will reveal cultural patterns. Considering these maps will show where new connections and associations must be formed if the necessary creative connections are to be made. Then, given these studies, a Global Brain Politics must be developed that works to connect these creative associations to engines of action in a sort of “Digital Distributed Democracy” (Last, 2014). Only then can a significantly more effective societal nervous system (and brain) be said to be emerging.

A Global Brain Anthropology would follow the lead of researchers who have dedicated time to imagining and constructing systems that foster greater collective intelligence. They recognize that the patterns of information flows between people are highly responsible for shaping what kind of experience they have within our environment and what they are capable of accomplishing. Furthermore they recognize that these patterns can be consciously shaped to maximize results we find desirable. In effect, they’re applying the very conscious nature of cultural evolution to the mechanism of cultural evolution (information sharing) itself in an attempt to improve the systems of data flow in our society.

Data enthusiasts such as MIT’s Pentland (2014) have shown that things like group creative output can be modeled, tested for, and improved by restructuring communicative flows between members of the group. Who communicates with whom, the number, duration, and timing of communications, the selection of the group, and the content of the interactions all have potentially predictable and optimizable sequences. The principles that have been shown in a limited setting by Pentland and conceived of on a global scale by others like Lévy (1997) is that by analyzing and redirecting cultural flows, we can create an organism that bears the characteristics that we chose to maximize.

In order to think about what might make a collectively intelligent entity “smarter” and more capable, we might take inspiration from the processes by which an individual human might improve their brain. How this might work can be exemplified in a brief thought experiment. Let the universe be restricted to just humans and books, where books are the only way for people to gain information about the world they are living in. In this universe, if human A reads a new book each month and human B reads a new book only once a year, then there is no doubt that human A has thought about the world from a wider variety of perspectives than human B, and therefore can be said to “know” more about it. When a problem in Human A’s environment arises, they will have a much greater wealth of information to draw upon to help solve the problem. Human B’s brain will be limited in the tracks its thoughts may take, and therefore its ability to effectively tackle environmental challenges will be lesser on average.

What happens inside the brains of individual humans necessarily affects what happens in between the brains of individuals. Perhaps it should no surprise then that a similar effect as just described in the thought experiment might happen with regards to collective intelligence. A small group of people trying to solve a complex problem facing the group have less of a chance of combining in an effective way on average than does a larger group that has a richer variety of perspectives and expertise that can be drawn upon. It is interesting to note that groups do face problems when they grow in size as they lose the ability to come to a consensus and it becomes harder to sort through what information is actually useful. There is an undeniable streamlined nature to small-group problem solving. However, in theory, if a larger group could be managed, it would have far more potency than would the small group. In any event, conflicts within the group should only be productive as they represent two different interpretations of the world that must be reconciled if the most accurate rendering of the world is to be approximated. This is why new collectivities specifically designed to maximize collective intelligence by drawing from as much information and possible, sorting it, and helping to resolve conflicts must be hypothesized and tested, for we exist in a world where the problems facing groups require far more coordination than did the problems facing our ancestors.

Once a community has been analyzed along the lines of a Global Brain Anthropology, one must set about building institutions that increase the collective intelligence of that community by creating new linkages between community members. These new linkages will allow for more creative collective thought, as well as build empathy between the members of the group. After these institutions are in place, work must be done in order to vest them with power to make decisions on behalf of the community. This process is what is termed here a Global Brain Politics. Institutions founded on the notion of humanity as a Superorganism and backed by Global Brain theory must be the governing structures of our future if we are to realize the potential of our current technological explosion.

## 2. Conclusion

There are two main themes discussed in this paper. The first is that, via cultural evolution, humanity has continued to coalesce into a larger and larger superorganism. This complex entity that represents a higher level of biological organization, and it is developing more rapidly than ever with globalization and the emergence of the internet. Communication between humans has built our biotechnological superorganism, and communication pathways are malleable. There is a degree to which these patterns are self-organizing, and there is a degree to which they are actively shaped by people. The production and distribution of media and the design of socio-political organizations are two examples of ways in which communication flows can be intentionally manipulated in order to produce desired results. The second lesson was that the malleability of cultural pathways is always a politically contested process, a fact that the formation and emergence of the Global Brain cannot escape. The organic powers of self-organization are counteracted by manipulative forces that seek to stunt diversity of thought and limit access to decision-making apparatus. There will have to be significant coordinated socio-political action upon our cultural flows that can combat any segments of society that have the ability to derail the blossoming of a healthy, sustainable superorganism.

Anyone who is aware of the Global Brain’s formation thus are in the position to incite the massive changes that our world’s future holds. This paper does not doubt the ability of humans to come together and establish effective ethical systems for the functioning of our society; it holds up the potential of the Global Brain and believes that conceiving of our society as a superorganism is an excellent first principle upon which to our new society. The author hopes to activists to use the GB concept to frame their struggles and borrow both its practical and spiritual strength for their movements. It also hopes to encourage

those aware of the GB's potential to think like an activist in their research and projects so that the Utopian ideal does not get derailed by those who may have a short-term interest in doing so. With any luck, the Global Brain will develop quickly from its current brilliant theoretical phase into concrete, experimental initiatives aimed at transitioning our magnificently deficient world to the one imagined in the Global Brain utopia.

### Acknowledgements

To Cadell Last for his active engagement in my own discovery process and help focusing my ideas and to my reviewer for their extensive, thoughtful comments.

### References

- Anon, 2015a. The Cost of Winning an Election, 1986–2014. The Campaign Finance Institute (March, Web. [http://www.cfinst.org/pdf/vital/VitalStats\\_t1.pdf](http://www.cfinst.org/pdf/vital/VitalStats_t1.pdf)).
- Anon, 2015b. Corruption Perceptions Index 2015. Transparency International (Web. <https://www.transparency.org/cpi2015/>).
- Barthel, M., Shearer, E., Gottfried, J., Mitchell, A., 2015. News Habits on Facebook and Twitter. Pew Research Center, Washington, D.C. (July 14, <http://www.journalism.org/2015/07/14/news-habits-on-facebook-and-twitter/> accessed September 12, 2015).
- Dawkins, R., 1976. *The Selfish Gene*. Oxford University Press, Oxford (1978, c, Print).
- Geertz, C., 1973. *The Interpretation of Cultures: Selected Essays*. Basic, New York (Print).
- Goertzel, B., 2002. *Creating Internet Intelligence: Wild Computing, Distributed Digital Consciousness, and the Emerging Global Brain*. Kluwer Academic/Plenum Publishers.
- Haber, M., 2013. Colonies are individuals: revisiting the superorganism revival. From Groups to Individuals. *Evolution and Emerging Individuality*. MIT Press, p. 195 (Web).
- Herman, E.S., Chomsky, N., 1988. *Manufacturing Consent: The Political Economy of the Mass Media*. Pantheon Books, New York, pp. 297–313 (Print).
- Heylighen, F., 2007a. The global superorganism: an evolutionary-cybernetic model of the emerging network society. *Soc. Evol. Hist.* 6 (1), 58–119.
- Heylighen, F., 2014. Return to eden? Promises and perils on the road to a global superintelligence. In: Goertzel, B., Goertzel, T. (Eds.), *The End of the Beginning: Life, Society and Economy on the Brink of the Singularity*.
- Hölldobler, B., Wilson, E.O., 2009. *The Superorganism: The Beauty, Elegance, and Strangeness of Insect Societies*. W.W. Norton, New York City, pp. 24–29 (Print).
- Kaku, M., 2014. *The Future of the Mind: The Scientific Quest to Understand, Enhance, and Empower the Mind*. Doubleday, New York City (Print).
- Kroll, A., 2013. 6 Mind-Blowing Stats on How 1 Percent of the 1 Percent Now Dominate Our Elections. *Mother Jones* (June 24, Web. <http://www.motherjones.com/mojom/2013/06/one-percent-wealthy-dominate-2012-elections-congress>).
- Kurzweil, R., 1999. *The Age of Spiritual Machines: When Computers Exceed Human Intelligence*. Viking, New York (Print).
- Last, C., 2014. Global Brain and the Future of Human Society. *World Futur. Rev.* 1–8 <http://dx.doi.org/10.1177/1946756714533207>.
- Last, C., 2015a. Information-Energy Metasystem Model. Wordpress.com. Global Brain Institute (17 May, Web. Sept. 2015. <https://cadelllast.files.wordpress.com/2012/12/last-c-2015-information-energy-metasystem-model-iemm2.pdf>).
- Last, C., 2015b. Big historical foundations for deep future speculations: cosmic evolution, atchnogenesis, and technocultural civilization. *Found. Sci.* <http://dx.doi.org/10.1007/s10699-015-9434-y>.
- Last, C., 2015c. Human metasystem transition theory. *Journal of Evolution and Technology* 25.1. [Jetpress.org](http://jetpress.org). Global Brain Institute, pp. 1–16 (Jan. 2015. Web. Sept. 2015).
- Lévy, P., 1997. *Collective Intelligence: Mankind's Emerging World in Cyberspace*. Plenum Trade, New York (Print).
- Lutz, A., 2012. These 6 Corporations Control 90% of the Media in America. *Business Insider* (June 14, Web. <http://www.businessinsider.com/these-6-corporations-control-90-of-the-media-in-america-2012-6>).
- Mitchell, A., Gottfried, J., Eva Matsa, K., 2015. Facebook Top Source for Political News among Millenials. Pew Research Center, Washington, D.C. (June 1, <http://www.journalism.org/2015/06/01/facebook-top-source-for-political-news-among-millennials/> accessed September 12, 2015).
- Pentland, A., 2014. *Social Physics: How Good Ideas Spread—The Lessons from a New Science*. Penguin, New York, NY (Print).
- Spencer, H., 1860. *The Social Organism*. In: McGee, J., Warms, R. (Eds.), *Anthropological History: An Introductory History*. McGraw-Hill, New York, NY, pp. 24–40 (Print).
- Stock, G., 1993. *Metaman: The Merging of Humans and Machines into a Global Superorganism*. Simon & Schuster, New York (Print).
- Turchin, V., 1977. *The Phenomenon of Science: A Cybernetic Approach to Human Evolution*. Columbia University Press (Web).
- Wilson, D.S., Sober, E., 1989. Reviving the Superorganism. *J. Theor. Biol.* 136 (3), 337–356 (Feb. 8, Web).

**Forrest Rosenblum** The author was living and working in the San Francisco Bay Area after completing his undergraduate degree at Boston University. Committed to helping humanity smoothly transition into its next, incredible phase, he is considering a variety of graduate school options so he can continue to research and publish on the topic of the Global Brain.