

## Study of “A Response to Bill Joy and the Doom-and-Gloom Technofuturists”

by John Seely Brown and Paul Duguid

Just a few months after mankind entered the third millennium, a long article was published about the development of new technologies and the future of the human race, that would create many reactions and spur an intense debate in all intellectual and scientific circles. By writing “Why the future doesn't need us”<sup>1</sup>, and by deliberately giving it a provocative and alarmist tone, Bill Joy knew he would not fail to stir up a controversy which he thought was highly needed, since it was to draw the attention of the public on the dangers of the famous GNR - Genetics, Nanotechnology, Robotics - and to initiate a general reflection on the foundations of scientific research.

Undeniably, his endeavors were successful. The article, published in the “Wired” magazine, created a major debate and received thousands of reactions, ranging from total catastrophism to full rejection of the author's warnings. Some even said that this document's importance equated that of the 1939 letter from Albert Einstein to President Roosevelt to warn him of the possibility of a nuclear bomb. It must be said that the computer scientist behind this article is none other than the co-founder of Sun Microsystems<sup>2</sup> and the leading developer of BSD Linux and Java, among other things. A figure recognized and respected in the world of technology, he is one of the pillars of the community inventing and developing the very machines cited in his article, which is why his call caused great surprise. All the more since Bill Joy is a major investor, which funds many new technology development projects.

The author calls for the complete abandonment of the GNR, which are threatening humanity, and warns against an arms race between nations. The main culprits, according to him, are the scientists who develop new technologies without worrying about the potential dangers. The computer scientist cites a conversation he held with the famous futurist and singularity theorist Ray Kurzweil, which made him aware of the lack of lucidity of the researchers. Since then, similar calls have been made, as a joint paper written by Elon Musk and Stephen Hawkins in January 2015<sup>3</sup>.

The problem, however, is that the reactions provoked by such calls are rarely nuanced. Either their authors rally to the caller's opinion, and condemn the new technologies, accusing the “mad scientists”, or they oppose the statements of the call, accusing the authors of being “neo-Luddites”. The debate is thus padlocked by caricatural positions.

A concept developed by Sheila Jasanoff in an article entitled “States of Knowledge: The Co-production of science and Social order”<sup>4</sup>, offers however a reasonable alternative to reactions that either predict the end of the world or universal panacea.

1 Bill Joy. (2000, April 1). Why the future doesn't need us. Retrieved from <http://www.wired.com/2000/04/joy-2/>

2 Sun Microsystems was an international company which greatly improved some very important computer technologies, such as Unix operating systems and the Java programming language.

3 Elon Musk and Stephen Hawking. (2015, January). An open letter, Research priorities for robust and beneficial artificial intelligence. Retrieved from <http://futureoflife.org/ai-open-letter/>

4 Sheila Jasanoff. (2006). Ordering knowledge, ordering society, *States of knowledge : The Co-production of science and Social order*, London and New York, Routledge, pp. 13-45.

This concept is named “co-production”. The author gives the following definition; “Co-production is shorthand for the proposal that the ways in which we know and represent the world (both in nature and society) are inseparable from the ways in which we choose to live in it”<sup>5</sup>. She adds: “We gain explanatory power by thinking of natural and social orders as being produced together”<sup>6</sup>. Thus, the fundamental flaw of the current scientific enterprise would be its reductive vision of the world, which does not take into account human and social factors. The mistake would be legitimized by the persistent assumption that there is a dichotomy between science and society, one being rational, the other not. However, as demonstrated Bruno Latour<sup>7</sup>, this separation is completely artificial, and for ages, science and society, nature and culture have been acting together; some will say that science influences society, and vice versa, but it's even more than that; the interaction between these two spheres, which form only one, in fact, is continuous, and the distinction is mostly a theoretical tool that allows the human mind to assimilate more easily the reality which surrounds it.

The concept of co-production is usually utilized as part of articles advocating more responsible development of new technologies, more in line with society and its needs. She stresses the need to reintroduce the human factor in the equation, in order to avoid disasters, and foster a democratic and enlightened society. The charge thus aims at the scientists, the companies, and the governments, whose lack of transparency, and whose lack of concern for environment and for the stakeholders, is highly problematic.

Getting back to Bill Joy's article, one might, rather than complacently spreading doom and gloom, opt to focus on a co-productionist approach, and try to promote the interactions that bind tightly science and society. Thus, it would be salutary, even before developing GNR, to ensure that all necessary measures (political, legal, environmental, etc.) have been taken to minimize the uncertainties and the potential dangers of these technologies; their uses should be determined as accurately as possible, as well as the need to develop them. It is therefore not useful to fantasize about Eric Drexler's “grey goo”. Instead, we need to mobilize all stakeholders in order to make decisions that we will not have to regret later.

This more moderate approach would enable us to avoid the Collingridge dilemma, following which, on one side, the GNR being developed, the disaster would be impossible to prevent, and where, on the other side, potentially useful technologies, which could improve the existence of mankind, would be downright abandoned. Except in very specific cases (that of artificial intelligence, for example)<sup>8</sup>, society should be able to take adequate measures in order to take advantage of new technologies without harming itself.

As we can see, the concept of co-production allows to maintain a fruitful debate, demanding the actors of these new technologies to show more responsibility. But this concept can also be used in a quite different goal, for example to discredit those who asked for scientific decisions that would take into account society as a whole. It is this assertion we wish to illustrate here, by studying the response of two scientists to the article by Bill Joy, which they titled “A Response to Bill Joy and the Doom-and-Gloom Technofuturists”<sup>9</sup>.

5 *Ibid.* p 15.

6 *Idem.*

7 Bruno Latour. (1993). *We have never been modern*. Harvard University Press.

8 On this particular subject, and for more information on decisions concerning the development of potentially harmful technologies, see Nick Bostrom. (2014). *Superintelligence: Paths, Dangers, Strategies*. Oxford University Press.

9 John Seely Brown and Paul Duguid. (2000, April 13). A Response to Bill Joy and the Doom-and-Gloom Technofuturists. The Industry Standard. Retrieved from <http://engl102-f12-lombardy.wikispaces.umb.edu/file/view/A+Response+to+Bill+Joy+and+the+Doom+and+Gloom+Technofuturists+by+John+Seely+Brown+and+Paul+Duguid.pdf>

John Seely Brown and Paul Duguid are respectively, chief scientist of the Xerox Corporation and director of the Palo Alto Research Center (PARC), and a research specialist in the Division of Social and Cultural Studies in Education at the University of California, Berkeley, but also a consultant at the Xerox PARC. For them, Bill Joy is misguided, and his call demonstrated an undue pessimism. To illustrate their point, they first use an analogy with nuclear energy, recalling that during the first years of use of this technology, two types of reaction were observed. The first announced that the reign of unlimited energy had begun, and that soon, capitalism would collapse, because everyone would have access to this inexhaustible source of energy. The latter, however, was predicting an imminent nuclear apocalypse. The ideological confrontation thus saw two opposing visions, which the authors characterize as the “Nirvana”, and the “Armageddon”. This excessive polarization obviously does not answer the questions that legitimately arise in the context of the implementation of a nuclear industry.

According to the authors, Bill Joy fell into the trap of caricature, and forgot one of the fundamental element of the equation: society. Interesting argumentative reversal, in which the two scientists, accused by the author of "Why the Future Does not need us" not to consider society, assert that he himself is forgetting to take into account society in his analysis. John Seely Brown and Paul Duguid even mention a "technological tunnel vision," which would explain Bill Joy's obsession for disastrous omens. Only focusing on technology, he thus forgets about human's ability to think and elaborate plans to prevent worst case scenarios. Reading the two authors, it is easy to connect their arguments with the concept presented by Sheila Jasanoff;

“[...]technological and social systems shape each other. The same is true on a larger scale. Technologies - such as gunpowder, the printing press, the railroad, the telegraph and the Internet - can shape society in profound ways. But, on the other hand, social systems in the form of governments, the courts, formal and informal organizations, social movements, professional networks, local communities, market institutions and so forth - shape, moderate and redirect the raw power of technologies”<sup>10</sup>.

Going against the flow, the two scientists show a fairly astonishing faith in society and its institutions, which will always be strong enough, in their opinion, to avoid disasters, while critics usually aim at those who develop technologies considered dangerous, because they fail to take society into account. Rhetorically speaking, it is bluffing; Bill Joy, which was considered as a serious computer scientist, warning mankind against a terrible danger, is now presented as a naive individual, frightened by chimeras because he was not able to take into account the influence of society.

And the authors do not stop there; they intend to demonstrate that Bill Joy knows nothing, and that GNR are still far from being a threat to humanity, although the opposite is so often heard. Regarding genetics, first, they put forward the law, and especially the obstacles faced by multinationals such as Monsanto and Cargill, which, mocking what the public was thinking, tried to develop technologies, only to encounter protests, boycotts and moratoriums. Society would have slowed down scientist's urge, too interested to make a profit, and too little concerned with the potential risks; “Having ignored social Concerns, however, proponents have made the people they need to educate profoundly suspicious and hostile”<sup>11</sup>.

10 *Ibid.* p 3.

11 *Idem.*

The second example is that of nanotechnology: again, according to the authors, Bill Joy's fears are just fantasies. Because nanotechnology is invisible to the naked eye, it seems uncontrollable, and thus frightening. But in fact, great progress is still needed, and, as John Seely Brown and Paul Duguid say, "Useful nano systems are probably Decades Away"<sup>12</sup>. Finally, the according to the authors, the robots will become a danger when they will be able to learn independently and to have a social life.

One might think such eminent scientists, working in a recognized research center, both are well informed, and that, indeed, the risks are largely overstated by people which tend to imagine the worst. Bill Joy would lack confidence in society. Using several examples employed by Sheila Jasanoff in her presentation of co-production, the authors insist; "[...] social mechanisms allow society to shape its future. It is through planned, collective action that society forestalls expected consequences (such as Y2K) and responds to unexpected events (such as epidemics)"<sup>13</sup>.

The presentation is quite convincing, and the moderate tone along with the expertise of the two scientists seem reassuring compared to the outrageously alarmist tone of Bill Joy's article. Nevertheless, whether John Seely Brown and Paul Duguid are right or not, their "response" is itself very criticizable<sup>14</sup>. Indeed, their arguments are primarily technical. Certainly, "Why the future doesn't need us" is probably a set of pessimistic visions of the future of the human species that the current state of scientific knowledge denies altogether. From a purely theoretical point of view, there is no doubt that the authors of the paper know their subject, and the GNR at the time were unable to threaten the future of humanity. But that is not the issue, really. Not only did Bill Joy voluntarily exaggerate to draw attention on a future danger, but in addition, his article is not technical; it is political, philosophical and societal. When asked whether or not we should continue to develop potentially harmful technologies, the two scientists answer with a set of technical arguments about the "state of the art". It is of little importance here that these technologies still are in their infancy; the question is precisely whether to allow them to develop further or not. John Seely Brown and Paul Duguid carefully omit to answer that particular question.

When, in their conclusion, the two scientists evoke Thomas Malthus and HG Wells, authors of "self-unfulfilling prophecies" that would have saved mankind by imagining - and thus by allowing it to avoid - the worst events, they nevertheless fail to see that if Bill Joy is so alarmist, it is because one of the characteristics of GNR - such is also the case of artificial intelligence - is that they first develop silently, without disrupting our daily lives, and then suddenly "explode", bringing irreversible changes to our existence almost instantly.

The arguments of the two authors are very clever, and we can only agree with their wise moderation, but it does not in any case answer the real questions that arise whenever we wish to develop the GNR, questions that Bill Joy was right to highlight.

<sup>12</sup> *Ibid.* p 4.

<sup>13</sup> *Ibid.* p 5.

<sup>14</sup> Besides the reasons we present here, we must take into account the passage of time; whereas at the time, for example, robots were actually incapable of learning, "artificial intelligence" today benefits from (reinforced) deep learning, which contradicts the arguments of the two scientists.