Special Section: Neuroethics

Anthropological Challenges Raised by Neuroscience: Some Ethical Reflections

HUBERT DOUCET

The Nobel Laureate Illya Prigogine compares the recent breakthroughs in human biology to the major changes that occurred when the Neolithic period succeeded the Paleolithic, 12,000 years ago. Although there is disagreement about the meaning of these changes, most opposing views recognize that a "major transformation" took place.[1] Some interpret the recent breakthroughs in neuroscience as the first step toward "our posthuman future"[2] whereas others see the consequences of these achievements as the end of humankind. Genomics and neuroscience are the main fields that, at this point, give rise to such a debate, some authors stating that neuroscience raises even greater anthropological and ethical challenges than does genomics. This article focuses on neuroscience. Its main object is to critically assess these diverging opinions on the impact of neuroscience and to determine whether both sides are not telling us something important about ourselves and how neuroscience could enlighten healthcare ethics.

I begin by critically examining the discourse of those who perceive in neuroscience the royal road toward posthumanity and, consequently, the futility of all discourse about transcendence and the spiritual. Two features of the posthumanist perspective are discussed: first, the support given to this position by biotechnology, and, second, the vision of ethics considered implicit in neurobiological knowledge. In the second section, I analyze the opposite position, the apocalyptic view in which neuroscience announces the end of humanity and, by the same token, the end of transcendence and the spiritual dimension. Once again, two features are examined: the contribution of biotechnology to the apocalyptic view, using the example of neuropharmacology, and the interpretation of neurobiological knowledge labeled "neuro-essentialism." Are these positions so diametrically opposed that only one of them can be considered defensible? I don't think so. Both discourses are saying something important about who we are and could make a major contribution to the field of healthcare ethics. This constitutes the third section of the article.

Neuroscience and Optimism

Dominique Lecourt, a French philosopher, has adopted the expression "proud techno prophetism" to characterize biotechnology, one of the sources of the

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major transformation identified by Illya Prigogine.[3] To go further than Lecourt, it could be said that neuroscience takes pride, not only in its technical ability, with its astounding findings about the brain, but also in the power of its knowledge to transform the conditions of life itself. In this sense, the optimistic discourse of the whole field of neuroscience is interpreted, by its contradictors, as a proud prophetism. This optimistic trend originated with Francis Bacon (1561–1626). In the *New Organum*, Bacon asserts that medicine has not yet acted in conformity with its duty to relieve the burden of the human condition. For Bacon, scientific knowledge was, until his time, based on a "fundamental error," that could only be corrected by the practical applications of modern medicine. Men and women would thus enjoy good health until old age. This Baconian thinking explains why the machine, which in Bacon's day was already a powerful icon, represented such an ideal model for the understanding of the human body. For this new medicine, to understand the human body, one had to think of it as a well-functioning machine.

The transhumanistic and posthumanistic trends belong to the Baconian mode of thinking. Nick Bostrom defines transhumanism as

> The intellectual and cultural movement that affirms the possibility and desirability of fundamentally improving the human condition through applied reason, especially by developing and making widely available technologies to eliminate aging and greatly enhance human intellectual, physical, and psychological capacities.[4]

It refers to "an intermediary form between the human and the posthuman."[5] Posthumans refer to "possible future beings whose basic capacities so radically exceed those of present humans as to be no longer unambiguously human by our current standards."[6] Major and varied changes will occur, such as radical transformation of the body, which is, on the one hand, denied, and, on the other, rebuilt. Illustrative of this movement is the statement of the Australian artist Stelios Arcadiou that: "The body is an anachronistic shell, which we have to get rid of as soon as possible."[7] According to this perspective, because the body as it has always existed is unable to adapt itself to the contemporary technological revolution, it has to be redesigned. For example, thanks to nanotechnologies and artificial intelligence, human nature could be enhanced. Knowledge of neurotransmitters leads not only to "a broad increase in scientific knowledge about the biochemical nature of the brain and its mental processes," but also to the development of wonder drugs like Prozac, Ritalin, and (sooner or later) memory enhancing drugs.

To become posthuman, does it suffice to modify our vision of the human being, or to make changes in our psychological nature? It would be an error to interpret posthumanity in such a limited way. The transformations called for are of another order: "Radical technological transformations to our brains and bodies are needed."[8]

The posthumanism that aims at transforming what we call human cannot be separated from biotechnology. It is the most powerful example of what Dominique Lecourt has called "proud techno prophetism." It is, however, not the only optimistic trend in the field of neuroscience. For some neuroscientists and philosophers, the development of neurobiology engenders unbridled enthusiasm because it challenges the classical vision of what it means to be human and

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takes intellectual debates in new directions. The works of the neurobiologist Jean-Pierre Changeux are enlightening examples of an attempt to explore a new humanism and a new universal ethics.

Changeux, a member of the faculty of the College de France and former president of the French National Ethics Committee, is a neuroscientist with an international reputation. His scientific research is grounded in issues of a philosophical nature. He has published, among other things, *Neuronal Man: The Biology of Mind* and, more recently, *L'homme de vérité*. In 1998, he published *La nature et la règle*, translated in 2000 under the title *What Makes Us Think?*, a challenging dialogue with the philosopher Paul Ricœur. Changeux concludes *L'homme de vérité* by saying:

> Having decoded the human genome, scientific research gives us hope that we will understand the brain and its functions, at the individual as well as at the societal level. Everything that traditionally belonged to the spiritual, the transcendent, and the immaterial domain is in process of being materialized, naturalized, and, dare I say, humanized. Is it the end of humankind? On the contrary, I rather see a prodigious, vital ferment.[9]

Jean-Pierre Changeux has a comprehensive agenda, described by the author himself as "immense."[10] Its aim is to re-create those periods in history before scientists and philosophers went separate ways[11]; the scientific enterprise was, at the same time, a philosophical one. Changeux's goal is to develop an approach that infers what ought to be from what is. If Changeux himself recognizes, on the one hand, that such a statement is contrary to what has been endorsed since Hume, he adds, on the other hand, that his enterprise "is in keeping with a long philosophical tradition which includes Hume himself, Saint-Simon and Auguste Comte, Darwin and contemporary ethology."[12] The scientific knowledge that reveals how the brain works instructs philosophers as to the nature of humans.

Changeux's thinking does not take him back to an ancient world where natural law was based on the finality of nature. On the contrary, in his debate with Paul Ricœur, he states, regarding Spinoza: "Can anything more exciting be imagined than to try to reconstruct human life in a way that rejects teleology, that rejects anthropocentrism, that rejects all conceptions of the world that take shelter in religious superstition?"[13] Ricoeur interprets the naturalization of ethical models as *dehumanizing* because these models become separated from the symbolic systems of particular cultures. On the contrary, thanks to naturalization, the way is now clear for understanding what is the most authentically universal and open-minded in the ethical project.[14]

Human beings are naturally disposed to resolve moral dilemmas, and ethical normativity is the result of the dynamics of evolution. Indeed the natural predispositions to make moral judgments are based on the extreme complexity of the human brain, a complexity characterized by levels of organization developed through the evolutionary process. According to Changeux, the brain's complexity will, in the end, make it possible "for humankind to create a future where 'the good life, with and for others, within just institutions' (Ricoeur's definition of ethics) is reached. Let us hope that it will lead to increased happiness."[15] This clearly optimistic thesis regarding neuroscience is

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challenged by an opposing, frankly pessimistic, view. Dominique Lecourt calls it "catastrophism."

Neuroscience and Pessimism

A discussion of major concerns arising from biotechnology within the field of neuroscience will help to introduce the apocalyptic vision. In his book, *Our Posthuman Future*, Francis Fukuyama devotes a great deal of space to the domain of neuropharmacology. He mainly alludes to Prozac and Ritalin as examples to illustrate the neurotransmitter revolution—"that is, a vast increase in scientific knowledge about the biochemical nature of the brain and its mental processes."[16] It is not surprising that psychotropic drugs "have emerged as a major cultural phenomenon in the late twentieth century."[17] They constitute wonder drugs because they affect "that most central of political emotions, the feeling of self-worth, or self-esteem."[18] To gather recognition is at the very core of the American culture; it is an issue of self-identity. They make possible the pursuit of happiness, which, in the United States, "is a strange sort of duty": "We are compelled to pursue fulfillment through enhancement technologies not in order to get ahead of others, but to make sure that we have lived our lives to the fullest."[19]

Fukuyama's main critique of neuropharmacology is that drugs are diverted from their therapeutic aim to promote instead well-being and enhancement: "The path is opened toward a drug that in certain ways looks uncomfortably like the soma of Aldous Huxley's *Brave New World*."[20] Our way of understanding the human being is largely impoverished, the latter being totally reduced to its biology. Other dimensions that helped us to understand the human condition and human behavior are dismissed. Personal responsibility for one's own actions is greatly reduced by the medicalizing of more and more behavior; corporate interests are all too ready to profit from this situation, and medicine has colluded in the process.[21] The consequences of this trend are appalling; posthumanism is equivalent to the end of humanity as we know it.

The concept of neuro-essentialism as meaning the end of the human is another aspect of the pessimistic vision. The techniques of functional imaging such as position emission tomography—PET—do not only offer information about neurological diseases, but also reveal the basic physiology of cognitive phenomena. This knowledge raises the same challenge we face with genomics. In discussing the sequencing of the human genome, some authors equate the human being with its genes. In *Science*, Alex Mauron raises the question: "Is the Genome the Secular Equivalent of the Soul?"[22] The content of many neuroscientist articles leads to a similar question. Indeed, in fathoming the secrets of the brain, science can appear to penetrate the mystery of subjectivity and personal identity. In their analysis of the print media's content on neuroscience, Racine and collaborators use the concept "neuro-essentialism" to describe this interpretation: "The brain is used implicitly as a shortcut for more global concepts such as the person, the individual or the self."[23]

In my view, neuro-essentialism corresponds to the biological naturalism of a number of neurobiologists and philosophers: "Mental phenomena are caused by neurophysiological processes in the brain and are themselves features of the brain."[24] This is an aspect of the positivistic and materialistic trend for which

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truth cannot be found outside the experimental method. No knowledge is possible outside its measure. All other forms of knowledge that would allow us to express the living reality of the human person are excluded because they have no relevance: The human being is nothing more than its brain. Is this not *The Astonishing Hypothesis* enunciated by Crick in 1995?[25] As the knowledge of the brain expands, the field of consciousness shrinks. What about soul, mind, consciousness? What about the other dimensions of human experience?

By reducing human reality to its scientific dimension and mind to brain, a number of personal, social, and cultural dimensions are cast aside. In the healthcare field, this is implicit in the fact that we prioritize symptoms over causes. Although we recognize that for "millions of people in the world who are clinically depressed . . . Prozac and related drugs have been a godsend,"[26] it remains easier to prescribe a psychotropic drug that will anaesthetize the patient's suffering than to listen to him or her. By unraveling the secrets of the brain, neuroscience makes itself "the most opaque screen for the body to unveil its true human reality."[27] The human being is deprived of different dimensions of its humanity.

Between Proud Prophetism and Apocalyptic Catastrophe

The previous pages have presented opposing views on the role of neuroscience in the way we think of the human. These theories are not simply those of philosophers debating among themselves; they affect healthcare, for which neuroscience has become an integral part, as well as bioethics, whose orientations rest on our specific understandings of human nature. The ethical interpretations of neuroscience already confront us at the clinical level, many neural interventions being already easily accomplished. Of course many of the ethical issues are similar to those that are faced in medicine. Others are specific, neuroscience raising questions about basic dimensions of our human identity. "Our definitions of competence, mental health and illness, and death" will likely be affected.[28] Neuroscience is not without an influence on the way we care for patients or we look to the future of healthcare. As Farah and Wolpe mention, the concerns are not only related to the safety of the drugs and procedures used in neuroscience but mainly with "neuroscience-based enhancement":

> This is actually a group of related concerns resulting from the many ways in which neuroscience-based enhancement intersects with our understanding of what it means to be a person, to be healthy and whole, to do meaningful work, and to value human life in all its imperfections.[29]

The critics of cognitive enhancement "worry that these enhancement technologies will separate us from what is most our own."[30] In *Better Than Well*, Carl Elliot shows, through fascinating stories, that in the American dream "many enhancement technologies are interesting (and sometimes unsettling) not primarily because they enhance people, but because they affect something central to their identities."[31] Through these debates, the very meaning and praxis of healthcare are at stake. These debates concern the whole community.

To this first remark I would add a second: Neuroscience does bring a positive contribution to our understanding of ethics, especially bioethics. Standard bio-

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ethics, to borrow McKenny's term,[32] "considers the body only in terms of the moral status of persons, their rights, and so on."[33] It leads to the exclusion from the absolute respect for the human person that is basic to bioethics those who do not meet its criteria; for example, those with minimal brain development are excluded.[34] Tristram Engelhardt is the best representative of this trend: "Not all humans are persons." Humans are "distinguished primarily through their biological peculiarities as primates." To be a person is not important to belong to this entity; it requires being self-conscious.[35]

Neuroscience forces us to develop an *incarnate* notion of ethics, wherein the body is affirmed: "If specific abilities, personality traits and dispositions are manifest in characteristic patterns of brain activation and can be manipulated by specific neurochemical interventions, then they must be part of the physical world."[36] By the recognition of its grounding in human biology, ethics reestablishes a link with the corporeal and with the universal.

In its work on the biological foundations of the consciousness, neuroscience reaffirms the central importance of the body for ethics: The body has something to teach ethicists. Among other things, as Damasio's works show, ethics cannot neglect the emotions, because reason and emotions are closely linked. In its debates focusing on the human body and the human person, bioethics could be greatly enriched by neurobiology.[37]

Neuroscience allows ethics to reestablish links with the universal. The exclusive cultural approach advocated by ethical relativism closes each community in on itself. Each of them has its own culture and values: How can they be challenged? In restoring a place for the body and the species, biological approaches open avenues that have been closed to ethics, especially bioethics.

The third point focuses on the assertion that neuroscience calls for a naturalization of ethics. A number of neurobiologists are convinced that their field of research has firmly established the natural or scientific foundations of ethics. Changeux, among others, largely refers to social Darwinism to base his view. This view had already been criticized by George Edward Moore in his *Principia Ethica*. He called it "naturalistic sophism."[38] In his discussion with Jean-Pierre Changeux, Paul Ricœur challenged the point of view of his colleague, for whom there is a duty "to replace a static world, created by God, with an evolving world having neither cosmic teleology nor purpose."[39] Indeed, according to the philosopher, to take Darwinism seriously "would appear to suggest that the picture of life as a dispersed phenomenon has nothing to contribute to an understanding of morality, considering, not the actual morality, but its *normative significance*."[40]

Ricœur explains the naturalistic sophism by the fact that neuroscientists, like Changeux, in hoping to establish a "neurology of meaning," "are dealing only with a psyche found in the psychology laboratory, which may not be the rich psyche of lived human experience."[41] To successfully "group together all related disciplines under the banner of neurobiology,"[42] neurobiologists must dismiss the *esprit* (in French in the text) as a part of human experience,[43] and distort it by reducing it to a scientific fact. To understand inner human experience or the lived world is of no interest to such neurobiologists.

Beside this materialism to which many scientists subscribe, looming ahead we see a huge revival of interest in "the inner meaning of the universe and human life"[44]: spirituality, in other words. Whatever the interpretation given to

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this spiritual movement, it is clearly one of the highlights of the present century. If some see it as an out-of-date battle, others discern in it a desire to regain contact with the experience of the self. Others see it as a search for the transcendent, requiring the self to focus outward, which is essential for meeting the diversity of the other-than-self. Emmanuel Levinas's ethics is very enlightening in connection with this orientation.[45]

It seems to me that the most dangerous theory is the one that asserts its superiority without attempting to understand the total human experience. Toward the end of *What Makes Us Think?* Paul Ricœur tries to help Jean-Pierre Changeux understand the meaning of his religious experience. To the latter, who invites him "to travel the same path without religion," Ricœur answers: "Fine, I've got nothing against it. I'm trying to explain to you what a religious man says and does in response to your arguments."[46] What Ricœur fears is the lack of recognition for other ways of thinking, recognition essential for acknowledging the other, without which there is no ethics.

Neuroscience is another example of how divided we are about many of the major issues that concern our life together. Bioethics originated from the dream of restoring the dialogue between "biological knowledge and human values."[47] In spite of interdisciplinary work, commissions and committees, and endless studies, we have not yet succeeded in bioethics at enriching the dialogue about who we are and our place in the universe. There is no denying that casuistry remains a useful tool for deciding what to do in many of the perplexing situations facing healthcare. It does not promote such a dialogue about who we are; it knowingly puts it aside. The anthropological themes raised by the breakthroughs in neuroscience might further develop the ethical dialogue envisaged at the outset of bioethics.

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