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**Jean-Pierre Changeux and Paul Ricoeur: What Makes Us Think? □□□□**

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# 1 — A Necessary Encounter

## Knowledge and Wisdom

Jean-Pierre Changeux: You are a well-known and admired philosopher. I am a scientist. My professional career has been devoted to the theoretical and experimental study of the elementary mechanisms involved in the functioning of the nervous system and, particularly, the human brain. If I seek to understand the brain by approaching it through its most microscopic structures, which is to say the molecules that compose it, this hardly excludes a desire to understand its highest functions, which traditionally come within the domain of philosophy: thought, the emotions, the faculty of knowledge, and, of course, the moral sense. As a molecular biologist I find myself confronted with a formidable problem: how to discover the relationship between these elementary molecular building blocks and highly integrated functions such as the perception of beauty and scientific creativity. After Copernicus, Darwin, and Freud there remains the conquest of the mind, one of the most formidable challenges facing science in the twenty-first century.

Since the most ancient antiquity, philosophers have argued about what traditionally in France is called *l'esprit*—not *l'Esprit* with a capital E, or “Spirit,” but what Anglo-American authors mean by “mind.” Even though our respective positions may seem as far removed from each other as they could be, the encounter between philosophy and neurobiology seems to me not merely welcome but necessary. I have enormous admiration for your work. I have not found many authors in France—perhaps owing to the fault of my own ignorance—

who have thought as deeply about the problems of morality and ethics as you have. Why should we not work together to try to construct a common discourse on these topics? Perhaps we shall not succeed. But our attempt will at least have the value of identifying points of agreement and, still more importantly, of exposing areas of disagreement and throwing into relief the gaps that one day or another will have to be filled.

Paul Ricoeur: I wish to respond to your words of welcome with an equally warm greeting addressed to a renowned man of science and the author of *Neuronal Man*,<sup>1</sup> a work worthy of the closest and most respectful attention.

What we are undertaking is a discussion, in the strong sense of the word. It is motivated first by a difference in our approach to the phenomenon of human life that has to do with our training, respectively, as a scientist and a philosopher. But it is motivated also by a desire, if not to resolve the differences related to this difference in our points of view, at least to raise them to a level of argumentation permitting the reasons of one to be regarded as plausible by the other, which is to say worthy of being defended in the context of an exchange governed by an ethic of debate—what the philosopher Jürgen Habermas calls *Diskursethik*.

I want to make my position clear at the outset. I am a partisan of a current of European philosophy that contains three distinctive approaches, typically referred to as “reflective philosophy,” “phenomenology,” and “hermeneutics.” The first approach, reflectivity, emphasizes the mind’s attempt to recover its power of acting, thinking, and feeling—a power that has, so to speak, been buried or lost—in the knowledge, practices, and feelings that exteriorize it in relation to itself. Jean Nabert is the leading representative of this first branch of the tradition to which I belong.

The second, phenomenology, refers to the ambition of going back “to things themselves,” which is to say to the manifestation of what presents itself to experience as the least encumbered of all the constructions inherited from cultural, philosophical, and theological history. This concern, by contrast with the reflective approach, lays stress on the *intentional* dimension of theoretical, practical, and aesthetic life and defines all consciousness as a consciousness of something. Husserl is the eponymous champion of this branch.

The third term, hermeneutics, refers to an approach that derives from the interpretive method applied first to religious texts (exegesis), classical literary texts (philology), and legal texts (jurisprudence), and stresses the plurality of interpretations associated with what may be called the reading of human experience. The masters of this third branch, which challenges the claim of any philosophy to be devoid of presuppositions, are Dilthey, Heidegger, and Gadamer.

Henceforth I will use the generic term “phenomenology” to designate the philosophical tradition that I represent in this discussion in each of its three branches—reflective, descriptive, interpretive.

Changeux: In my case the experience of belonging to the world of scientific research, and more particularly of biological research, has profoundly influenced my thinking.

While still quite young, as a student, I took part in what might be called the molecular biology movement. Its aim, in the 1960s, was to elucidate the structure and function of the molecules that are situated at the ultimate boundaries of life. This program met with success, as is well known,<sup>2</sup> and led to further research. Certain of these molecules, called allosteric proteins, possess a crucial and dual feature: they serve, on the one hand, to determine a particular biological function, for example a chemical synthesis; on the other hand, they obey a

signal that regulates this function. These proteins introduce flexibility into cellular life, acting as switches that help to coordinate the functions of the cell but also to promote the cell's adaptation to the conditions surrounding it.<sup>3</sup> To understand in strictly physico-chemical terms biological functions that are essential to the life of the cell has been, and continues to be, the objective of a tradition of research of considerable scope and vitality with which I enthusiastically align myself.

More unexpected was the demonstration that followed. The brain was shown to possess molecules that are very similar to these bacterial switches—receptors of chemical substances known as neurotransmitters that assist communication *between* nerve cells.<sup>4</sup> Our cerebral functions, from the most modest to the most elevated, are also rooted in physico-chemical nature by virtue of the fact that they are mediated by these molecular switches.

The extreme complexity of cerebral organization and its development became accessible to the methods of molecular biology by the end of the 1960s, opening up a second line of research. It was no longer possible to think of the brain as a computer composed of circuits prefabricated by the genes. To the contrary, connections between nerve cells are gradually established over the course of development by a process of trial and error. The selection and elimination of such connections are regulated to a substantial degree by the newborn infant's interaction with the environment and with itself. In short, the brain cannot be viewed as a strictly genetic machine; it incorporates, within a defined genetic envelope peculiar to the species, a series of nested "epigenetic" imprints that are established by variation and selection.<sup>5</sup> Another way of stating this hypothesis is to say that evolutionary (epigenetic) competition inside the brain takes over from the biological (genetic) evolution of species and creates, as a consequence, organic links with the physical, social, and cultural environment.

A very fruitful interface is produced in an entirely natural way, then, with the human sciences and society.

A third line of research, so far theoretical for the most part, relies on the new methods of modeling made possible by computer technology to try to further exploit our still quite partial knowledge of the functional organization of the brain. It consists, for instance, in devising the simplest plausible neural architectures that constitute a formal, or artificial, organism capable of carrying out a defined cognitive learning task. Two features distinguish this approach. On the one hand, it is “neurorealist” in the sense that it appeals only to known elementary components of the brain, for example the molecular receptors of neurotransmitters I have already mentioned; on the other, it tries to define the minimal degree of complexity that a network of nerve cells capable of carrying out specifically human tasks must possess.<sup>6</sup> The theoretical program consists in trying to give an account, in a rigorously formal way, of a behavior defined on the basis both of the anatomical organization of a network of nerve cells and of the activity that takes place in this network. This enterprise, known as connectionism, has illustrious antecedents: the cybernetics of Norbert Wiener, the universal computing machine conceived by Alan Turing, and the first neural network model developed by Warren McCulloch and Walter Pitts to represent the “embodiment of mind.”<sup>7</sup>

As a member of the faculty of the Collège de France, I am required to present the current state of knowledge in my field, which is continually evolving, in a didactic form. *Neuronal Man*, to which you referred a moment ago, represented a synthesis of my first seven years of lectures. Its aim was to make the dazzling progress of the sciences of the brain more widely known. I realize today that this attempt to organize the available knowledge regarding the brain, from the molecule to mental activity, has had a powerful retroactive effect on my

own conception of the brain and its functions. In this regard I share with René Thom the view that what counts in the modeling process is its *ontological import*, its impact on our conception of the origin of things and beings—in other words, its underlying philosophy. While writing *Neuronal Man* I discovered Spinoza's *Ethics* and the full rigor of his thought. "I shall consider human actions and appetites," Spinoza says, "just as if it were an investigation into lines, planes, or bodies."<sup>8</sup> 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—what Spinoza called the "refuge of ignorance"? This reading came to complete and enrich my acquaintance with the pre-Socratic philosophers. I have always been and remain still very attached to Democritus, in particular, among the ancient atomists.

None of this suffices to explain the very marked interest I have in ethical questions, which led me to read your work *Oneself as Another*.<sup>9</sup> The decisive event was a talk I gave on the neurosciences shortly after *Neuronal Man* appeared to a working group of the Comité Consultatif National d'Éthique dans les Sciences de la Vie et de la Santé, the committee that advises the French government on issues in bioethics. In the very lively debate that followed I found myself driven into a corner. How can neuronal man be a moral subject? I have not ceased since to reflect upon this question, to make a serious attempt to give new meaning to an ethics of the good life—a joyful, humanist ethics compatible with the free exercise of reason. It is this attempt that sparked my interest in talking with you today.

The cleavage between scientists and philosophers is relatively recent. In antiquity, philosophers such as Democritus and Aristotle were also excellent observers of nature; mathematicians such as Thales and Euclid were philosophers as

well. With the Hippocratics, a rational medicine grew up alongside the shamanistic medicine (or medicine not far removed from shamanistic traditions) that was still dominant in ancient Greece. Rationality came to be introduced into the domain of traditional medicine with the rejection of all assumptions of magical or divine intervention and the search for natural causes. The physician made a diagnosis and, on the basis of this, proposed a treatment, a course of medication. Instead of hunting demons, a pharmacological agent was now employed to attack material causes of illnesses. No longer a demiurge, the physician was now a rationalistic and scientific philosopher.<sup>10</sup>

The cleavage between scientists, philosophers, and artists occurred after the Renaissance, though one still finds during this period artist-scientists such as Leonardo da Vinci and later, in the nineteenth century, a certain tradition of philosophical thought among scientists—I am thinking here, for example, of Augustin Cournot and Henri Poincaré and, more recently, Jacques Monod. On the other hand, a tradition of interest in scientific knowledge has been carried on in philosophy by William James, Henri Bergson, Bertrand Russell, Rudolf Carnap, Maurice Merleau-Ponty, and, in our own time, by philosophers such as John Searle, Daniel Dennett, and Paul and Patricia Churchland.

Ricoeur: I think of Georges Canguilhem, also Gaston Bachelard. For me, Canguilhem's *La Connaissance de la vie*<sup>11</sup> is an important point of reference. Canguilhem was both a philosopher and physician. He showed how human beings structure their environment and project "vital values" that give *meaning* to their behavior. They thus manage to inaugurate a normativity that is distinct from the operation of physical law. As for Bachelard, he recognized in *La Formation de l'esprit scientifique*<sup>12</sup> a distinct form of inventiveness related to the

power of “epistemological rupture” but comparable to poetic creation.

Changeux: Bachelard examined the mental activity of the scientist in a particularly original way, it is true. One might also cite the dialogue between Karl Popper and John Eccles, the one a philosopher and the other a neurobiologist, as it happens. In their joint work *The Self and Its Brain*<sup>13</sup> one finds an entire program worked out, in fact.

Ricoeur: They tried to construct a philosophical system that organized in a hierarchical way the levels at which the sciences of the brain and the philosophy of mind interact. No doubt we will encounter this problem quite often in our discussion as well.

Changeux: Yes. We have therefore at least one relatively recent example of dialogue between a philosopher and a neurobiologist. Eccles’s approach was different from mine, however. He was interested in the electrical activity of the nerve cell and of groups of neurons. The point of departure for his thinking was therefore at a level more organized than that of the molecule, which may explain some of the differences between our points of view. Eccles was also perhaps one of the last neurobiologists to believe in the dualism of mind and brain.

## Knowledge of the Brain and Self-Knowledge

Changeux: The exchange of views to which we both look forward turns on a question that seems to me essential, namely to what extent the spectacular progress that has been made in our understanding of the brain over the last twenty years or so will lead us to reexamine the fundamental problem of what

is usually called the relation between body and mind or, as I would prefer to characterize it, the relation between the brain and thought. The past few decades have seen the emergence of an entirely new field, cognitive science, that draws upon work in physiology, molecular biology, psychology and the human sciences. It has given rise to highly promising interdisciplinary collaboration involving not only researchers in the natural sciences but also anthropologists and other social scientists. This new alliance holds out the prospect of achieving a unified and synthetic view of what was formerly a question reserved for philosophy (when it was not reserved for religion) by building upon our present state of knowledge about the brain and its functions. It now becomes possible, I would argue, for a neurobiologist to legitimately take an interest in the foundations of morality, for example, and, conversely, for a philosopher to find material for reflection, even edification, in the results of contemporary neuroscience.

The fundamental question—a philosophical question, on which I would like our debate to focus—is whether the progress of knowledge in the sciences of the nervous system, the brain, and, more generally, cognition calls for a reexamination of the crucial distinction made in the eighteenth century by David Hume, which many philosophers and scientists seem still to endorse today, between the factual—what is—and the normative—what ought to be; that is, between knowledge, in particular scientific knowledge, and moral rules. Does this distinction need still to be upheld or can we now inquire into the relationship between moral rules and nature by using our scientific knowledge of the brain and its higher functions to enrich ethical reflection? I am aware that this question, despite its importance, is a highly sensitive one. Many of our fellow citizens continue to regard morality as belonging to the domain of religion. In fact, I should think that most people believe that morality serves to protect us against science and

technology. Well-intentioned persons wonder with what right a scientist can chair a committee on bioethics, as I did for six years, rather than a jurist, for example. Others challenge the very presence of scientific experts on such a committee. As a result, it is hard to see how any cooperative relationship can be established between scientists and ethicists.

Few members of the general public realize that the idea of a science of ethics is not new. It is found in the work of Auguste Comte,<sup>14</sup> who proposed a positive morality of altruism subordinating selfish desires to sympathetic instincts that would stand as the “seventh science,” the science par excellence, uniting the natural with the scientific and the social to produce morality. Comte even went so far as to propose “phrenological physiology” as a scientific basis for morality, relying upon Gall’s notion that the seat of each innate and irreducible faculty is localized in a particular part of the brain. Comte exploited Gall’s model in order to advance the hypothesis that the more or less complex interaction of these faculties affects the emotional states that govern moral judgments.

Comte was not the only one to posit scientific laws of morality. Spencer, and after him Darwin, did so as well, though in contrary ways: Spencer emphasized the doctrine of *laissez-faire* and the success of the fittest at the level of society, Darwin the enlargement of sympathies and the social instinct peculiar to the human species. After them, the Russian prince Peter Kropotkin, remembered chiefly as the theoretician of anarchism, found in nature an objective moral law in the form of mutual aid. Similarly, the French politician Léon Bourgeois, a prime minister under the Third Republic and later one of the founders of the League of Nations, advocated solidarity as a secular republican morality on the model of Pasteur’s theory of protection against contagious disease.

Here one must be extremely careful. The grave perversion

of biology, and particularly of genetics, on behalf of exclusionary ideologies that encouraged racism and genocide is well known. Nonetheless the question whether ethics can be reconceived as an objective science of morality remains a very lively and topical one. Habermas, for example, has argued forcefully that moral judgment comes under the head of truth. For me, this question—at bottom an ontological question—is the first one we need to address.

Ricoeur: Is this question, which you call ontological and which I would call one of philosophical anthropology, really the first question we ought to consider? Permit me to come back to the way you pose the question of the relationship between nature and moral rules. I quite agree that this fundamental difficulty, well formulated by Hume, is one that we must tackle. But we cannot, to my way of thinking, take it up without first having clarified the epistemological status of the neurosciences. For my part, I cannot avoid taking a position with regard to a problem bequeathed by the most ancient philosophical tradition, from Plato to Descartes and from Spinoza and Leibniz to Bergson, namely that of the relation between the soul and the body. This relation is located at the level of ultimate, irreducible, primitive entities that are constitutive of what analytic philosophers like to call the furniture of the world. This is the level of fundamental ontology. In Descartes's time—and that of his followers, Malebranche, Spinoza, Leibniz—it was supposed that ultimate reality could be apprehended in terms of substance, which is to say in terms of something that exists in and of itself. The question thus arose, on the assumption that things are made of substance, whether man is made of one or of two substances. This grand quarrel, sustained by a considerable argumentative apparatus, survives today only in bastard and skeletal forms such as psychosomatic parallelism, inter-

actionism, reductionism, and so on. To oppose spiritualist dualism to materialist monism amounts to a crude oversimplification of what was at issue in the seventeenth century.

I do not propose to argue on the ontological plane, whose bases were undermined by Kant in the Transcendental Dialectic of the first *Critique*. Relying instead on the resources furnished by phenomenology, I will restrict myself, modestly but firmly, to considering the semantics of two distinct discourses—one concerning the body and the brain, the other what I will call the mental.

My initial thesis is that these discourses represent heterogeneous perspectives, which is to say that they cannot be reduced to each other or derived from each other. In the one case it is a question of neurons and their connection in a system; in the other one speaks of knowledge, action, feeling—acts or states characterized by intentions, motivations, and values. I shall therefore combat the sort of semantic amalgamation that one finds summarized in the oxymoronic formula “The brain thinks.”

Changeux: I avoid using such formulas.

Ricoeur: I proceed, then, from a semantic dualism that expresses a duality of perspectives. The tendency to slip from a dualism of discourses to a dualism of substances is encouraged by the fact that each field of study tends to define itself in terms of what may be called a final referent, something to which appeal can be made as a last resort. But this referent is final only in its respective field, and comes to be defined at the same time as the field itself is defined. It is therefore necessary to refrain from transforming a dualism of referents into a dualism of substances. Prohibiting this elision of the semantic and the ontological has the consequence that, on the phenomenological plane where I take up my position, the term *men-*

*tal* is not equivalent to the term *immaterial* in the sense of something noncorporeal. Quite the opposite. Mental experience implies the corporeal, but in a sense that is irreducible to the objective bodies studied by the natural sciences. Semantically opposed to the body-as-object of these sciences is the experienced body, one's own body—my body (from which I speak), your body (the body that belongs to you, which I address), the body of another (his body or her body, about which I make up stories). Thus the body figures twice in the discourse I propose, both as “objective” body and as “subjective” body or, as I would rather say, one's own body. I prefer to speak of one's own body, rather than of the subjective body, because the body in question is not only mine but the body of others as well. Therefore: body as part of the world, and as that *from which* I (you, he, she) apprehend(s) the world for purposes of orientation and in order to live in it. Here I am very close to P. F. Strawson's position in *Individuals*,<sup>15</sup> where he shows that two series of heterogeneous predicates can be applied to the same person, considering him or her either as an object of observation and explanation or as enjoying the relationship indicated in our language by possessive pronouns such as “mine,” which themselves belong to the list of expressions that linguists call “deictic,” or demonstrative—here, there, now, yesterday, today, and so on. The deictic form that interests us here is the “mine” of my body. My initial hypothesis, then, which I submit for your consideration, is that I do not see a way of passing from one order of discourse to the other: either I speak of neurons and so forth, in which case I find myself in a certain language, or I speak of thoughts, actions, and feelings that I connect with my body, to which I stand in a relation of possession, of belonging. Thus, I can say that my hands, my feet, and so forth are my organs in the sense that I walk with my feet, I grasp with my hands—but this comes under the head of personal experi-

ence, and I do not have to commit myself to an ontology of the soul in order to speak in this way. By contrast, when I am told that I have a brain, no actual experience corresponds to this; I learn about it in books—

Changeux: Except when you have a headache or when a cerebral lesion, due to an accident for example, has deprived you of speech or of the capacity to read and write.

Ricoeur: We will come back later to the question of what sort of instruction clinical observation may provide for the conduct of life, that is, apart from the need for treatment, the need to adjust behavior to a “reduced” environment, to use Kurt Goldstein’s phrase.<sup>16</sup> For the moment, let’s stay on the epistemological plane. A critical point, which at first sight appears to be simply linguistic but which in fact goes far beyond this, is that there is no parallelism between the sentences “I grasp with my hands” and “I think with my brain.” Everything that I know about the brain is one kind of knowledge. However, there are other kinds of knowledge as well. I suspect you and I may disagree about the answer to the following question: Does the new knowledge that we have about the cortex add to what I already know through direct bodily experience and, in particular, everything that I know about emotions, perceptions, everything that is genuinely psycho-organic and connected with my possession of my body? There is only one body that is mine, whereas all other bodies are outside me.

Changeux: I see the problem. First, I agree with you that there exist two types of discourse that refer to two distinct methods of investigation in the sciences of the nervous system. One bears upon the anatomy, the morphology of the brain, its microscopic organization, nerve cells and their synaptic connections; the other concerns conduct, behaviors, emotions, feel-

ings, thoughts, and actions on the environment. These two modes of description have long been separated from each other, all the more so because at the beginning of the century one tradition of research on animal and human behaviors—behaviorism—deliberately omitted to take into account the anatomical and pharmacological aspects of the central nervous system. The brain was put aside as a “black box.” This research nonetheless had a positive effect: it led to the objective analysis of animal behavior in experimental situations—learning, for example, or feeding habits, vocalizations, sexual behavior, and so on. These observational data, described in their own special terms, are indispensable for research in the neurosciences. In many cases where one attempts to model cognitive processes, in fact, such behavioral data constitute an obligatory point of departure.

But the description of cerebral anatomy concerns objects and uses a vocabulary that in no way coincide with the objects and vocabulary of behavior or, as you call it, personal experience. No neurobiologist would ever say that “language *is* the posterior part of the frontal lobe of the cerebral cortex.” That is meaningless. One says instead that language “makes use of” or, better yet, “mobilizes” particular areas of the brain. The term *mobilize* is particularly appropriate because it involves a set of processes that is not covered by either of your two discourses: dynamic and transitory *activities* that occur throughout the neural network. These electrical and chemical activities constitute an internal link between the anatomical organization of neurons and connections, on the one hand, and behavior on the other. It becomes necessary to introduce a third discourse, anticipated by Spinoza, that draws upon this functional dynamic in order to *unify* the anatomical and the behavioral, to link the neuronal description with that which is perceived or experienced. I would say therefore that I am not guilty of semantic confusion, or amalgamation, but that I uti-

lize instead several “discourses,” or descriptions, that need to be related to each other in an adequate and operational form.

Ricoeur: It’s not only the anatomical and the behavioral that have to be related to each other, for they both fall under the category of objective knowledge; but observed and scientifically described behavior, on the one hand, and, on the other, personal experience—and this in a meaningful way, in terms of what Canguilhem called “vital values.” It is at this level that the duality of discourse presents a problem.

Chanqueux: A problem, to be sure, but not an incompatibility. With regard to your second point, once again I find myself in agreement with you. The discourse about the body-as-subject, “my body from which I speak” and “his or her body that I make up stories about”—as distinguished from the discourse about the objective body, or brain, whose anatomy *and* observable activities I describe—comes under the head of the subject’s processes of conscious perception and the attribution to others of mental states, knowledge, emotions, and even intuitions. At first sight it may seem impossible to pass from the one discourse to the other, as you suggest. This is an issue of great importance, and we will certainly come back to it at length.

At this stage of our discussion I shall content myself with making two points. It is, of course, true that a person’s individual history, the memories accumulated during childhood together with the course of one’s affective life, give each person’s experience a particular “color,” “tone,” or “value”; but this owes nothing to some elusive metaphysics. It has to do instead with an epigenetic signature stabilized in our patterns of cerebral organization and acquired by each person over the course of his or her life. But the simple fact that we can communicate this experience with others through narratives,

poems, and works of art indicates, I believe, that despite individual variability our brains give us access as human beings to experiences that are in agreement with—if not always very similar to—our own. Moreover, despite obvious errors to which we are all liable, the capacity to attribute our own mental states to others indicates that another person has “personal experience” that is close to “mine.” We will see that new technologies of brain imaging allow the experience of others to be “objectively” analyzed and reproduced from one individual to another.

Nonetheless, I grant you, this type of neuroscientific investigation has so far yielded only partial advances. Such research is concerned with highly integrated functions of the human brain, conscious processes that open onto the world. The ability to model them constitutes a crucial step forward for our discipline. There is much that is unknown, but for all that nothing that is unknowable! Just the same, we must proceed with great care and humility. Grand though our ambitions may be, we are nonetheless obliged to take small steps, proposing models that are simple, partial, and fragmentary.

Ricoeur: The particular “tone” of each person’s personal experience does not depend on some “elusive metaphysics”; it depends on descriptions that have their own criteria of significance and that lend themselves to what may be called an essential analysis. As for the narratives, poems, and works of art that you rightly evoke in this connection, these are modes of discourse or expression that are on the same plane of understanding and interpretation. The way in which you present the research program of the neurosciences, incorporating conscious processes in it, makes it clear you are not a reductionist.

Changeux: Thank you very much—I am very frequently accused of being one!

Ricoeur: Reductionism is a reaction against ontological dualism. This leads on, if you will permit me to continue, to the next part of the question you regard as primary. I, too, am concerned with a dualism—a semantic dualism. If I had to claim a philosophical ancestor it would be Spinoza, whom you have mentioned already. For him the unity of substance was to be sought at a much higher level, which in Book I of the *Ethics* he calls *Deus sive natura*. Either I speak the language of the body, a finite mode of discourse, which for Spinoza was that of space; or I speak the language of thought, a distinct finite mode, which he persisted in calling the soul. I speak both languages without, however, being able to merge them. Whence my question: does any knowledge that I may have of the brain add to the knowledge that I have of myself simply through direct acquaintance with my body, without knowing anything about my brain? This initial question finds an echo in the ethical sphere to the extent that I am entirely prepared to say that ethics is rooted in life and that normative ethical behaviors find their origin in the impulses of life. Here again we find the problem of the duality of discourse. Life may mean two different things: there is life as seen by biologists, and life as it is—

Changeux: Experienced.

Ricoeur: Yes, as it is experienced. I do not much like this expression on account of its immediacy, which I think is quite influenced by language—a conversational, narrative language. In this regard I am something of an anti-intuitionist. In any case it seems to me there are three problems. The first results from the existence of two ways of talking about the body, one a discourse of appropriation and belonging, the other a discourse of distance, in which I consider a brain—the brain—that is not characterized by any property of appropriation or

by any deictic; it is neither here nor there, whereas one's own body is here in relation to other bodies that are there. One's own body may belong to me or to another person, someone incarnate—

Changeux: An observer.

Ricoeur: An observer who has a body, a body to which he stands in the same relation of possession; a corporeal, embodied observer for whom there are bodies, physical bodies, and among these physical bodies the brain. My first problem is therefore epistemological: do the neurosciences allow us to correct the linguistic dualism that I am insisting on? This would be the case if one could show that what one knows about the brain leads to changes in ordinary experience outside pathological or—to use Goldstein's term—catastrophic situations, and that therefore I would speak differently about myself once I had acquired knowledge about the brain. I have my doubts, but at the same time I wish to keep an open mind on account of the second problem, which arises from the implications of theories of evolution and their application to moral issues. Is this doctrine, which is known as “naturalism,” anything more than an attempt to shore up ethics by appeal to the biological facts uncovered by the science of the brain and observation of the behavior of living beings? Now, I am ready to grant much to the idea that human experience has a biological basis, much more than Kantian moralists would do. In this respect I am quite Aristotelian. What I call ethics—as opposed to morality, with its laws and prohibitions—seems to me to have deep roots in life, even if I cannot avoid passing over into the normative sphere at some point.

What makes this passage from ethics to morality obligatory? Well, because in the course of evolution, life has left us in the lurch, so to speak. By this I mean that biological organization

may lead us to have a certain disposition toward association, toward benevolence; but given the existence of violence and war, proscriptions must be devised, against murder and incest for example, so that we find ourselves faced with both continuity and discontinuity—continuity between life and an ethics rooted in life, and discontinuity at the level of a morality that compensates for its own costs, as it were, life having abandoned us to our own devices without providing rules that would make peace prevail over war and violence. This position, at least with regard to discontinuity, links up finally with that of Kant. I am very attached in particular to Kant's essay "Idea of a Universal History from a Cosmopolitan Point of View" (1784), in which he shows that life has bequeathed us the burden of an "unsociable sociability" and entrusts us with the "task" of devising a peaceful political order.

What is the origin of this task? This is the problem. There are several possible replies. On the one hand, as I say, there is the continuity of ethics, which is very deeply rooted in life, and on the other there is the discontinuity of morality, which is born in a moment of rupture. I was recently reading Thomas Nagel, one of the best contemporary moral philosophers, on the subject of impartiality.<sup>17</sup> For Nagel this is the moral moment par excellence, to which he attaches almost more importance than to justice; but the two come to the same thing, to the extent that justice consists in treating equals equally. This subject will need to be reserved for another time, however. For the moment I distinguish three discourses: yours, on the objective body; a second discourse on one's own body, with its vast ethical implications; and finally a normative discourse, dealing with legal and political issues, grafted on the two preceding discourses.

Changeux: You raise two important questions: does what one knows about the brain lead to changes in ordinary experience?

Is it necessary to create any sort of discontinuity or rupture between ethical discourse, which you regard as rooted in life, and moral, normative discourse? Later we will examine this problem in detail, drawing upon the most recent scientific results. My immediate response will be to refer to two philosophers: Lucretius, who affirmed in *De rerum natura* that “Our terrors and our darkneses of mind must be dispelled [. . .] not by sunshine’s rays, not by those shining arrows of the light, but by insight into nature”;<sup>18</sup> and Spinoza, who extended this conception of knowledge to man and the “human soul.” As Robert Misrahi has pointed out, Spinoza in the *Ethics* constructs “an integral knowledge of man and of his situation in the world,” a sort of “rational psychology.”<sup>19</sup> His new ethics aimed to show that the sources of the *value* of our actions and of our passions are to be discovered in man himself.

Whatever interpretation may be given to Spinoza’s philosophy, I take from it the notion that reflective knowledge of our body, our brain, and its functions (the soul) is fundamental to ethical reflection and moral judgment. I do not find grounds for assuming any moment of rupture; instead I carefully examine such new questions as may arise. To create a priori ruptures in discourse opens the way to irrationality, to the arbitrary and authoritarian normative discourse that we hear in so many parts of the world today. Is there any better way to protect ourselves against such irrationality than to lift the veil and to relentlessly seek *all* those truths to which scientific knowledge in its various forms and disciplinary expressions gives us access, without regard for the type and level of organization of the object studied? Why posit a discontinuity of discourse when objective knowledge of what determines our behavior holds out the prospect of greater wisdom, perhaps even greater freedom? As Spinoza remarked, “Experience tells us no less clearly than reason that it is on this account only that men believe themselves to be free, that they are conscious of their

actions and ignorant of the causes by which they are determined.”<sup>20</sup>

Ricoeur: Do you mind if I interrupt you in connection with Spinoza? This remark must be put in its full context, beginning with the theory of the unity of substance and the multiplicity of attributes and modes in the first book of the *Ethics* and concluding with the wisdom and bliss of the marvelous fifth book. The freedom that Spinoza criticized was that of the free Cartesian arbiter. But there is another philosophy of freedom, understood as necessity. This becomes clear only in relation to the beginning and end of the *Ethics*.

Changeux: There have, of course, been many reappropriations of Spinoza—particularly by persons belonging to the same school of thought as those who persecuted Spinoza during his lifetime. But I would like to come back, if I may, to the virtually inscrutable lines of demarcation that you draw between types of discourse. Such semantic dualism has had dramatic consequences not only for the development of ideas but also for the way in which scientific research is carried out and how research institutions function. The tendency to disciplinary isolation is very strong as it is, particularly in France, where physicists speak a language that is comprehensible only to physicists, where physiologists and sociologists alike use concepts that only they understand. These examples could be multiplied. The tendency to disciplinary partitioning undermines the work of our research institutions, although everyone is well aware of the considerable contribution made by physics to brain imaging, by chemistry to the symptomatic treatment of mental disease, by archaeology and history to the search for the origins of the major religions and to the redaction of their founding texts, and so on. The institutional gap that separates the life sciences from the humanities and social sciences

has had catastrophic results. Experience has shown that it is often at the boundaries between disciplines that great discoveries take place. Why rule out, as a matter of principle, the possibility that advances in reflective knowledge may succeed in establishing a continuity between analysis of the objective body and of one's own body, between ethical discourse and normative discourse? An interdisciplinary approach is likely to be fruitful, it seems to me, so long as one is scrupulously attentive to the meaning of words and the proper use of concepts.

I am nonetheless grateful that you do not insist on directing our conversation toward questions that from my point of view are without interest or even, as in the case of reductionism, a future. If I understand you correctly, we will also be able tentatively to put to one side all reference to systems of belief in a soul distinct from the body or in the immortality of the soul that so often figure in discussions of morality. I am delighted by this.

Ricoeur: You cannot decide in advance what is without interest or without a future. The question of reductionism is at the heart of philosophical discussion in Anglo-American circles; beliefs about the soul and the body have exercised the greatest minds and deserve to be discussed "within the limits of reason alone," as Kant did in his philosophy of religion. As for research on reflective knowledge, I do not evaluate it a priori since it is on the basis of exactly such research that I seek to pose the problem of the relationship between reflective knowledge and objective knowledge. It is also the basis on which I pose the problem of normative discourse. And there I am in agreement with you. I believe in the universal character of morality.

Changeux: So do I—but do we believe in it for the same reason?

Ricoeur: There are several kinds of reason. Charles Taylor in *Sources of the Self*<sup>21</sup> distinguishes a first kind, on the level of ordinary discourse, that he calls “strong evaluations”; another kind consisting of philosophical or other rationalizations; and a third kind, what he calls “sources” or deep motivations for belief, that is found in the cultural heritage of the great civilizations. Our own heritage Taylor sees as deriving from three traditions: Judeo-Christianity, the Enlightenment, and also Romanticism, which in his view extends up through the ecological movement of the present day. I believe that democracy draws upon this treasure of sources, or resources, and rests upon the capacity of citizens not only to support each other but also to aid each other. This capacity has its roots in all three traditions, the first of which founds justice on love, the second on reason, and the third on our relationship, and that of the natural environment, to life.

Chanqueux: This is a very Western view of “sources” and cultural heritages. It seems to me just as important to take into consideration those of Confucianism and Buddhism, as well as the heritage of the philosophical atomists of Greek antiquity, in addition to the Judeo-Christian tradition. On the other hand, I think that you make quick work of democracy. We should not forget the extreme animosity of Enlightenment thinkers toward Judeo-Christianity.

## The Biological and the Normative

Chanqueux: One of the issues we ought to tackle at the outset, it seems to me, has to do with the relationship between the language we use and the objects that matter to us and that we deal with in everyday life. It strikes me as essential, first, that together we examine whether a bridge cannot be created be-

tween the first two discourses, the one involving the body and the brain as objects of knowledge by an external observer, and the other a discourse of the self resting on a representation that we have of our body. For a neurobiologist such as myself, the notion of representation in this context constitutes a central point that may allow us to establish a real link between what might be called the objective and the subjective—I oversimplify, but these are the terms that are customarily employed. In trying to establish such a link we would be following the lead of certain philosophers today who are attempting to “naturalize” phenomenology. This is a rather rough way of putting things, I realize. The question at issue here is how far the knowledge that we have about our brain gives us a new conception of ourselves, a different representation of our ideas, our thoughts, and the dispositions that intervene when we make judgments. With regard to moral judgments, in fact, it is fundamental. The knowledge that we are now in the process of piecing together about the human brain ought to allow us to have a clearer idea—I am perhaps overly optimistic—of the direction in which we wish to see human society develop. Spinoza encourages us to construct a model of man as a social being that we can contemplate with satisfaction both now and in the future. I would like to see how far we can succeed in matching up these two discourses about the body, in achieving a synthesis that at first sight may seem to be impossible.

Ricoeur: I quite agree with this program; but before we try to put the two discourses about the body in correspondence with each other, I would like us first to assess the implications of the semantic dualism that I defend. This dualism, formulated in strictly corporeal terms, propagates itself along a line that divides personal experience from all the ways of objectifying integral human experience. It extends to mental phenomena

for which a knowledge of the brain does not seem pertinent, such as high-level cognitive activities associated with language and logic. I am thinking here of all those functions in which philosophers of mind and cognitive scientists are interested—beliefs, desires, and wishes expressed in terms of what are called propositional attitudes (“I believe that . . .”, “I desire that . . .”, “I decide that . . .”).

I would argue, however, that a still more subtle semantic dualism insinuates itself between experiences organized at a prelinguistic level and disembodied representations of mental experience that may be computationally formalized. It is not an exaggeration to say that the semantic gap is as great between the cognitive sciences and philosophy as it is between the neurosciences and philosophy. The gap between phenomenological experience and objective knowledge extends the full length of the line dividing these two approaches to the phenomenon of human existence.

But I hasten to say that this semantic dualism, expressing a genuine asceticism of reflective thought, can only be a point of departure. Owing to the multiplicity, abundance, and completeness of human experience, the two discourses continually intersect at a great many points. In a certain way—how I am not at all sure—it is the same body that is experienced and known; it is the same mind that is experienced and known; it is the same person who is “mental” *and* “corporeal.” From this ontological identity arises a third discourse that goes beyond both phenomenological philosophy and science. To my mind this would be either the poetic account of creation in the biblical sense or the speculative discourse that was raised to its height by Spinoza, overcoming the division between the attributes of thought and extension in order to assert the unity of substance. Descartes had hoped to be able to compose such a discourse but, in the end, abandoned the attempt. Spinoza, however, had the daring to go forward with it. Here one must

read Descartes's sixth *Meditation*, the *Passions of the Soul*, and the *Letters to Elizabeth*. In his system, which remained unfinished, it was to be the discourse of what some commentators on Descartes have called "the third substance," namely man. Well, the semantic dualism from which I proceed contains a comparable reference, if not to this possible third substance (and, beyond this, to Spinoza's doctrine of the unity of substance), then at least to man *tout court*. But I do not hesitate to say that as a philosopher I profess considerable skepticism with regard to the possibility of constituting an overarching discourse of this sort, above and beyond the profound unity of what appears to me sometimes as a neuronal system, sometimes as mental experience. In the last analysis we are dealing with two discourses of the body.

Changeux: I concur with your distinction between these various discourses, between organized experience and objective explanations of such experience, and I note your reluctance to propose an ontological identity involving a third scientific discourse. I do not join you, however, in seeing this attempt as a poetic discourse of creation in the biblical sense. You characterize your position as one of cautious agnosticism. Isn't *not believing* in the possibility of constituting such a third discourse evidence of an idealist prejudice? Doesn't this amount to weakening somewhat the *emendatio intellectus*, the discipline of thought, the asceticism of reflective thought that both of us uphold? Spinoza's speculative discourse seems to me quite distinct from poetic discourse, from the many myths of creation to which you compare it. His approach seems to me to be immensely more constructive. Spinoza himself wished to proceed with the same rigor of method as geometry. The scientist formulates hypotheses that, taken together and stated formally, constitute a theory. The researcher cannot hide from the facts. He runs the risk of being wrong. Scientific models

are subject to the verdict of facts. They are judged by facts. The exactitude of models can be tested. They can be falsified—and if they prove to be false, they are abandoned. Theory assumes the intelligibility of the world in advance of experiment. Nonetheless it is constrained by natural processes, by the phenomena that are studied. It is not a matter of discovering the Truth about being, but of progressing step by step in the acquisition of truths, aware that no scientific model can pretend to exhaust reality, whether it be physical, mental, or “experienced.” Why shouldn’t we revive Spinoza’s doctrine of the unity of substance, while acknowledging that the word *substance* no longer has the same meaning it had in the seventeenth century and that it must be redefined on the basis of present knowledge? You yourself have said that an ontology remains possible in our time, to the extent that the philosophies of the past remain open to reinterpretation and reformulation.

Ricoeur: There are several points to be made in response. I do not put the poetic discourse of the biblical myth of creation—which I mentioned a bit provocatively, I admit—on the same plane as the speculative discourse of Spinoza’s *substantia actiosa*, though they speak of the same fundamental unity. The one belongs to a realm of myth that is no longer ours (which is why you will not see me challenge evolutionary theory with any form of creationist dogma) but that may still stimulate thought in a free, speculative way that draws upon an ancient fund of wisdom disguised as a narrative account of origins. The other belongs to a speculative style of thought that has perhaps become inaccessible to us since Kant, unless through Fichte, Schelling, and the great system builders. For my part, I maintain a cautious agnosticism toward this kind of unitary discourse. But why then dismiss doubts about the possibility of elaborating a third discourse as an idealist prejudice? As for

your quite Popperian pleading on behalf of modeling and verification/falsification, I consider it irrefutable in your field, which is to say in the service of objective knowledge of nature and man. But this discourse does not move us an inch nearer to a renewal of Spinoza's unity of substance, which, once again, supposes that we accept the definitions of the first part of the *Ethics* and the final theorems of the fifth part. Spinoza's anthropology cannot be separated from his entire system. Nonetheless, despite my epistemological caution, I remain interested in attempts to reexamine and rework the great metaphysical doctrines of the past.

That said, I agree entirely that we should take the notion of representation as our touchstone in assessing the correlation of the two discourses, because it will force me to defend my presumption that in using this term there is a particularly great danger of confusion. The use of the term *representation* in the two languages, I fear, is ambiguous.

Changeux: Is the danger one of confusion or fusion?

Ricoeur: You notice that I referred to a "presumption" on my part. I enter into this discussion with a certain wariness: on the mental level I know what a representation is, because I have the notion of intentionality, the notion of purpose, the notions of subject and object; but I do not see how I will find representations in the brain.

I am therefore wholly in agreement about taking the notion of representation as central. Let me make it clear at the outset that it interests me not only on the epistemological plane, where the question of truth is at issue, but also in the context of our subsequent discussion of the passage from the vital, biological level to the normative level—to the moral plane. More important for me than the notion of representation, however, is the notion of capacity, which plays such a great role in Aris-

totle and Leibniz. For me, the able man is one who is capable of speaking, acting, talking about himself, subjecting himself to norms, and so on. Certainly the endowment with capacities is deeply rooted in the biological world, but the accession to moral competence supposes language, moral obligation, institutions—a whole normative, juridical, and political world. Here we meet again with the problem I mentioned a moment ago of continuity and discontinuity. Now this problem does not exactly coincide with that of the correlation between the neuronal and the mental with which we began. The problem in establishing such a correlation is a theoretical one, in which the scientific point of view confronts the phenomenological point of view. But with the question of human capacities we enter into the practical sphere. It is at this moment that the continuity-discontinuity problem presents itself. I propose therefore to distinguish between two problems, one associated with the idea of representation and the other with the idea of human ability or capacity to act.

Changeux: The notion of predisposition, or capacity, is essential for the neurobiologist. I unambiguously distinguish between dispositions to form representations and representations themselves.

To summarize the foregoing, then, I would say that the question we must address amounts to examining how far the normative can be rooted in the biological evolution and cultural history of humanity. Can a “new ethics” be devised according to which, following Darwin, the propagation of moral norms throughout human societies proceeds through the learning of “social instincts” of sympathy that have their origin in the evolution of species?

Ricoeur: That is precisely the question.