

Stephen J. Gould, Between Humanism and Anti-humanism. Neoteny, Exaptation and Human Sciences

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Abstract The aim of this chapter is to analyze the “effects”, more or less expected, that the neotenic conception of human nature, proposed by Gould in *Ontogeny and Phylogeny*, produced and may still have on the human sciences. Showing that man is a primate characterized by a developmental Heterochrony—a primate who “was born a year too early” and that “overexposes” his plastic and premature brain to a social and natural environment for a very long period of development—Gould has opened the way for all a series of cognitive and neurobiological consequences, psychological and linguistic, anthropological and philosophical of which we have not yet taken full measure. As it has been done on the basis of Gould’s theories by many scientists, the human brain—because of its high neotenic plasticity—can be considered as an extremely powerful device for the refunctionalization (exaptation) of preexisting biological structures, for purposes other than those selected by evolution. However, it is also possible to show that humans can compensate for the disadvantages caused by this neotenic condition only by establishing a communicative relationship with himself and with the world. Through this communicative relationship, the eye and the hand, ear and voice come to entertain synesthetic intersensory relations, unavailable to any other animal, which the unusual structure of metaphorical human experience and the propositional structure of the human *logos* are based on. It follows a conception of human experience that transcends the traditional distinctions between *Naturwissenschaften* and *Kulturwissenschaften*, and that sheds new light on the condition of man in our times.

In one of his most significant works, David Bohm—the great quantum physicist—observed that the biology and psychology in the second half of the twentieth century were still tied to epistemological mechanistic and deterministic models, completely overcome by the physics of the twentieth century. Although sciences of life and mind are fields of study in which the active and creative character of the

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instances which animate the “undivided wholeness of nature” become more apparent, biologists and psychologists insist on reducing the emerging and hierarchically ordered structures of living nature to molecules, genes, neurons or other supposed elementary particles. The virtualities, potentials and physical gradients that express themselves temporally and spatially, interacting with a living body that is part of this totality, are so reduced to hypothetical ““basic building blocks” out of which everything is made” (Bohm 1980, pp. 19–20). These ideal and mechanical atoms are not actually more, according to Bohm, than imaginary projections, ontological hypostasis of our language and patterns of action of our body. In other words, they are anthropomorphic metaphors.

Although this view is shared in different ways by many scholars educated by the great revolutions in physics of the twentieth century (Penrose 1989; Stapp 2007), we believe that this view does not apply to Stephen J. Gould’s biological reflection. Other contributors in this volume committed to showing the novelty of Gould’s idea of life, in the light of concepts of virtuality, potentiality, hierarchies of causal levels and networks of nonlinear spatiotemporal relations that closely resemble Bohm’s concepts. Rather than examine these issues in order to revise that judgment, however, we would like to focus on a seemingly marginal aspect of the scientific and philosophical production of Gould: his conception of man. This view seems innovative because of two facts. First, it provides us with an image that overcomes not only the determinism still prevailing in life and mind sciences, but also its dialectical antithesis: the idea that the main property of human nature is that of not having one, the idea of a “non-nature” of man. Secondly, this conception of man seems innovative to us because of the “effects”—in part unexpected by Gould himself—that it has produced in a series of border researches, which have made two simple and effective ideas—the concepts of exaptation and neoteny—the cornerstones of a new anthropo-biological model.

Let us briefly consider the first point. The question of human nature is a real front line for contemporary thought, the theoretical front of a war of which Gould, more than any other contemporary author, has highlighted the ideological and political stakes. The fact that this battle is overloaded with ideological and political values does not mean that this issue is hopelessly flawed, or that dealing explicitly with this issue necessarily means, as some assert, to commit the sin of anthropocentrism. Giving this a “positive” response, as Gould has attempted in the last chapter of *The Mismeasure of Man*, means showing that on the one hand if “we are inextricably part of nature”, on the other “human uniqueness” cannot be “negated thereby”. ““Nothing but” an animal—Gould argued—is as fallacious a statement as “created in God’s own image”” (Gould 1981, p. 354). Since, however, Gould’s warning was not enough to curb the wrong statements, we must then wonder which instances have come to occupy the two opposite extremes of God and animal in the current scientific-philosophical debate. And why does man feel the compulsive need to identify with what is not, with the *other* of himself, either God or the other animal?

Since Gould directed his criticism against the pseudo-scientific program that is called sociobiology or evolutionary psychology—which claims to bring human attitudes, behaviour and feelings to cognitive and behavioral modules, selected

from the species during the evolution and stored in the human genome in the form of discrete packets of information and rules required for the functioning of these robots pre-programmed by nature that are nothing but human beings, as well as every other living thing—the ongoing conflict on the issue of human has further widened, at least as far as philosophy is concerned. Split down between the two opposing sides of the “analytical” and “continental”, philosophy is divided into two factions: on the one hand, those who, motivated by a need for modeling cybernetic or formal logic, reduce the problem of human nature to the identification of a “super-mental program”, functionalist or connectionist, implementable “at will” in the brain or in the circuits of a powerful computer; and on the other hand, those who, aware of the risks of any formalization, strongly argue that the peculiarity of “human nature, is to have not one”, because the human being is the being who builds up his own nature in the course of history, through society, language and culture.

Although it appears to be unitary, this Continental position conceals significant differences, ranging from those who believe that any attempt to raise the problem of human nature in terms of “a what”, implies an inevitable “ontological degradation” of “the Who” of the one who interrogates, to those who believe that man is only a “texture effect”, or “sign” bound to vanish like a face drawn in wave-eroded sand. This continental position, however, proves to be fragile, especially with regard to current challenges. Habermas’s case is exemplary in this regard. In an attempt to argue against “liberal eugenics”, the last great heir of the Frankfurt School has been accused by his detractors of making use of a metaphysical concept of human nature that he had dismissed as ideological since the mid-50s, in his critical engagement with the only philosophical movement that had set the question of man on the double track of natural sciences and philosophy: German philosophical anthropology. In short, he couldn’t get rid of the problem of human nature, despite the legitimate suspicion and caution of *Critical Theory*.

The case of the great Richard Lewontin shows that even the most sagacious science isn’t free from such an impasse. After observing that every theory and practice of political power requires, more or less explicitly, a doctrine of human nature, and after denouncing the ideological use that liberal and individualistic contemporary society makes of biology, and in particular of the reductionist program of sociobiology, Lewontin (in one of his finest works, *Biology as Ideology*) concludes by quoting Simone de Beauvoir: “a human being is “*l’être dont l’être est de n’être pas*” (Lewontin 1990, p. 49). According to Lewontin, only the consciousness of this fundamental fact can return to the human species the consciousness of its responsibilities for action—responsibilities which, for better or for worse, are not given to any other animal, because no other species is given the opportunity to decide its own extinction. What moral should we draw from this paradox after which current biology converges on the same “meta-theoretical negative” positions of continental philosophy?

First of all, it shows us that not even the healthy use—implemented by Lewontin, and, recently, many other authors—of developmental biology, critique of genetic reductionism, and the return to a constructivist and dialectical conception

of the relationship between external and internal instances, between genes and environment, against any theory (Darwinian or Monodian), of their rigid opposition, is enough to magically produce a *positive* image of human nature. From a more creative and contingent nature, endowed with temporality and “history” already at the level of the embryonic development of a drosophila or a bee, it does not pass to the question of man in a gradual manner, but only with a meta-theoretical jump thanks to which the human nature comes to be thought out properly only by negation: *neither creature of God, nor monkey with a highly gifted brain, nor computational robot*. But how do we respond *positively* to our compulsive need for *identification*?

Let us start from a paradox. Commenting on King and Wilson’s pioneering results (King and Wilson 1975), on the minimum difference that separates the human from the chimpanzee genome, in *Ontogeny and Phylogeny* and *Ever since Darwin* (Gould 1977a, p. 405, 1997b, p. 45), Gould noted that the close genetic and evolutionary proximity risks leading to paradoxical difficulty. How can we explain that a small genetic difference, of 1, 4 per cent, may result in a behavioral difference, significant enough to ensure that no monkey will ever write the *Iliad* or the Beethoven’s *Fifth Symphony*? On the basis of a hypothesis advanced by King and Wilson, the only solution to this paradox may lie, according to Gould, in genes of special type—variously known as “key genes”, “master”, “architect”—responsible for a number of cascade effects (anatomical, cognitive and behavioral), distinctive features of the “anthropological difference” between humans and chimpanzees. What are they and where are these genes located? At present, Gould replied, unfortunately we do not know, but we know the way they act by regulating the timing of activation of other protein-coding genes. We also know that, in humans, their effects were described, in the second half of the ‘20s, by Bolk and de Beer (Bolk 1926; de Beer 1933), in terms of a general slowing of development that allows the human race to preserve even in adulthood twenty-five morphological and behavioral neotenic traits—“nudity”, orthognathism, advanced *foramen magnum*, hallux non-rotatable, persistent cranial sutures, shape of the pelvic bones in women, small teeth, prolonged childhood, etc.—typical of the juvenile, fetal and infant stages of the chimpanzee. But there’s more. As shown by Adolf Portmann (Portmann 1956), such ontogenetic development is in fact characterized by a *dual heterochrony* in which the *slowed* development phase is preceded by an *accelerated* one, intrauterine and postnatal, that determines, at first, an increase in the rate of development of the brain, and a necessary anticipation (of almost 1 year) of the birth’s moment and, afterwards, the slowed and prolonged overexposure of a “premature” and “almost fetal” brain to the human and natural stimuli of the environment. But—we must now pose a question—what evidence has contemporary biology given in support of this hypothesis that Gould proposed in the mid-70s? And also, what kind of philosophical consequences does this heterochronical development, this accelerated/decelerated process of individuation of the human body and brain, produce?

It is known that, in the mid-90s, Gould himself in his last colossal work (Gould 2002, p. 1322), hailed the harvest of results produced in two decades by the newborn

Evo-devo biology, as an experimental genetic confirmation of his earlier heterochronical theories of development and evolution, once forced to return to unidentified regulatory genes. Assumed at first—at the macro-descriptive level—by pioneers such as de Beer, Goldschmidt and Gould himself, these genes were indeed located for a few decades in these Hox genes, and other developmental regulatory genes, which determine, on the one hand, the *Bauplan* of the body of an individual belonging to a given species and, secondly, the timing of activation of other structural genes. Also Bolk, de Beer, Portmann, Gould's hypothesis, that the human being is nothing more than a primate with an accelerated/decelerated development now enjoys a certain credit even among Evo-devo biologists away from Gould's "saltationist heresy" (Gilbert 2003, p. 361; Carroll 2005, p. 107). It is, moreover, shared by contemporary neurobiologists, such as Alain Prochiantz, Steven Rose and Gary Marcus, who offer us precious arguments in support of the philosophical argument (almost Hegelian) that we would like to enunciate here: *the advantage offered by nature to a primate that was born a year too early—which enters the world with an only 23-percent-developed brain, and overexposes its plastic and premature brain to a social and natural environment for a very long period of development—is to consolidate intra-specific and social relations that inscribe in the brain matter the symbolic, language and institutional structures accumulated by species* (in the course of a rapid process of cultural Lamarckian evolution).

Before arguing the "tightness" of this neurobiological argument, we will attempt to briefly clarify its most general psychological and anthropological implications. Using the concepts of the phenomenological psychiatrist Erwin Straus, one could argue that, during the delayed human development, interpersonal relationship with the Other (*heteros*), precedes the relationship with the otherness of the world (*allon*) (Straus 1958, p. 68). Consequently, the relationship with the world is dialectically mediated, metaphorized, compensated by the communicative relationship with the *other*. Using the concepts of psychoanalysis, one could argue that the communicative, emotional and nutritional relationship with the other inscribes its structures in the neurobiology of the brain through the mediation—to use the term coined by the U.S. psychoanalyst Donald Meltzer—of the "sensory-motor montages" of the body (Meltzer 1975). In turn, psychoanalytic concepts find a new legitimacy and a new foundation in this anthropo-biological context: the Oedipus complex may also be read as a kind of mythical transposition of the original trauma of premature separation from the womb (Mahler 1968; Melandri 1968; Mahler et al. 1975; Tustin 1972, 1990), and paternal super-ego can be interpreted as the result of a process of "internal socialization", of "communication with oneself", which inscribes its effects in "the inside layers from which the drives echo" (Gehlen 1940, p. 304), in the unconscious itself.

At this precise point, in our opinion, a second argument intervenes, which is vital to understand the "human": the thesis of the neotenic heterochronie requires the theory of the communicative structure of human experience as a necessary complement. In part, this theory is present in the writings by Gould, who supported it by adducing the data provided by Montagu and developmental psychologists such as Passingham, but it can be better clarified by bringing together the analysis

provided in the mid-twentieth century by one of the leaders of philosophical anthropology: Arnold Gehlen. According to Gehlen, the human being can indeed compensate for the disadvantages caused by this condition of prematurity and overexposure only by establishing a communicative relationship with itself and with the world. Through this communicative relationship, the eye and the hand, ear and voice establish intersensory and synesthetic relations (Mazzeo 2005), unavailable to any other animal, and to those—as pointed out by the above-mentioned psychoanalysts—in whom such communicative relation fail to be established: people suffering from autism. This communicative relationship triggers off a number of processes of exoneration and refunctionalization of anatomical, neurobiological, and cognitive structures that are the basis, on the one hand, of the unusual metaphorical structure, which Gould as well as cognitive linguists like George Lakoff and Mark Johnson (Lakoff and Johnson 1999; Lakoff and Núñez 2000), attribute to human experience and, on the other hand, of the propositional structure underpinning the deliberative logos of the “rational animal”. The human being does not achieve this result because predestined by God or by evolution, but because it can exploit, in the process of cultural “homination”, the creative trick that, as shown by Gould, Vrba, and Jacob (Jacob 1977; Gould and Vrba 1982), nature uses everywhere: the exapting *bricolage*, or the exemption of a structure from old tasks and functions, and its reutilization for new ones. Relieved of walking, the hand is, for example, reused for communication purposes, which in turn are taken on by sign and gestural painting, and finally by the voice. In conclusion, the “voice of conscience” is not just a metaphor for deliberative thought that emerges with the rational animal, but the most archaeological trace of a process of biological and cultural evolution, which leads to a stable and effective result only when the phono-auditory apparatus, exempted from phonatory action itself, assumes the role of model and guide of the entire sensory and motor system. Therefore, the consciousness of one’s possibility of and responsibility for action, which Lewontin attributed to the human species through a sort of leap into the void, can perhaps be established more gradually.

To justify this collection of theses from the neurobiological point of view, we must go back schematically through three stages I have developed in detail elsewhere (Gualandi 2009).

- (a) On the basis of the analysis of contemporary neurobiologists such as Alain Prochiantz and Gary Marcus, we must first highlight the crucial role that development genes play in the processes of differentiation, construction and evolution of the brain, since “the basic model of the brain”—with partitions in hindbrain, midbrain and forebrain, and between right and left brain—is the same in all vertebrates because of regulatory genes (those that produce proteins that regulate the activation or deactivation of other genes) such as *Otx* and *Emx* (Marcus 2004, p. 141). Unlike the *Hox genes*, *Otx* and *Emx* do not follow, however, the rule of colinearity, that is, the topological arrangement of these genes on chromosomes does not correspond to the topological structure of the different sensory and motor areas of the brain. Therefore the sensorimotor

Homunculus of Penfield and Rasmussen cannot arise directly from them, but along a track mediated from *Hox* genes which govern the construction of the body. This must be remembered to understand the follow-up.

- (b) In the second place, starting from the Steven Rose's analysis (Rose 2005, p. 134), we have to demonstrate that genes such as *FOXP2*, responsible—according to some—for only human cognitive processes such as the propositional language, are not genes that determine the possession of a greater number of syntactic mechanisms and cognitive modules, deputed to specific functions, as evolutionary psychology would like to teach on the basis of the “model of the Swiss boxcutter” or of the “chimpanzees' highly gifted brains”. How could that happen—suggests Sean B. Carroll—if in humans, compared to chimpanzees, there are only two different amino acids out of a total of 716 that make up the protein encoded by the gene *FOXP2* (Carroll 2005, p. 264)? They are instead regulatory genes that, acting on the timing of activation of other genes, allow greater brain plasticity and a consequent exaptation of perceptual and cognitive structures already existing in other primates. As Gehlen and Plessner, the leaders of twentieth-century philosophical anthropology, had already guessed, the main feature of the neotenic human brain lies in that widespread “hyperconnectivity” which—according to Vilayanur Ramachandran (Ramachandran 2003)—allows the different sensory modalities to associate themselves through processes of exoneration and exaptation, which create intersensory patterns, synaesthetic and metaphorical relations, unavailable to other animals. These relations are the basis of the symbolic perception and the vocal and graphic language, as well as of the function of feedback/feedforward (Edelman 1989; Churchland 1995; Changeux 2002) that our “quiet conscience” has exapted from that sensory modality that connects us with the *Other* since the earliest days of life: our hearing. With the help of the analysis already proposed by Gehlen by the middle of last century, we can try to provide the first reconstruction, strictly materialist, of the genesis of that phono-auditory structure, which neurobiologists called “superior-” or “secondary-consciousness” and philosophers “self-consciousness”. This theory was otherwise confirmed by Straus's phenomenological aesthesiology and Jaynes's Psychiatry (Straus 1958; Jaynes 1976), the audio-phonology and the theories of lateralization advanced by Annett and Crow (Tomatis 1963; Annett 1985; Lieberman 1991; Crow 2004), the study of paleoanthropology made by Tattersall and Corballis (Corballis 1991, 2002; Tattersall 1998, 2002; Mithen 2005).
- (c) Going back to the developmental genes and Alain Prochiantz analysis, we could finally show that the sensorimotor montages and intersensory patterns, which allowed humans to speak and think in a particular way, are made possible by the fact that the developmental *Hox genes* affect the brain—leading to the sensory and motor homunculus of Penfield and Rasmussen—only through the mediation of the body, or through the feedback of the peripheral (sensory and motor) system on the central nervous system during the long process of individuation. Contrary to what cognitive psychology claims, we could show that “it is not the brain that thinks, but the body”

(Prochiantz 1997, p. 157) or, in other words, the brain only acts as a transducer of signals or sensitive interface to the dialectical relationship that the body engages with the world (Lewontin 1991, p. 45). In conclusion, the sensory-motor montages that the human body develops in its historical and cultural relationship with the external environment are placed in the plastic and premature neotenic brain, forming a sort of “outside inside” or “inner world outside” (Gehlen 1940, pp. 231, 298), or—to quote the words of the philosopher of cybernetics Andy Clark—an “objectified prosthesis” or an “external scaffolding” of the human mind (Clarck 1997, pp. 167, 191). Lewontin’s conception of a dialectical and interactive relationship, between the internal organism and the external environment, becomes now slightly more precise in the case of man.

But let us pose this question once again: why does the postmodern man feel the need to identify with a cerebral highly gifted monkey, with a computational machine or with an ontological nothing? This paradox can be explained primarily from a fact we already know. According to Prochiantz, the human being lives in the paradox of being “highly individuated” and being at the same time, a “very social individual”, an “extreme individual” that, as such, can be constituted in the course of a greatly delayed process of individuation (Prochiantz 1989, p. 78). Because the human brain is born a year too early, lacking those extra-specific coordinations that allow other animals to adapt “instinctively”—through a kind of “genetic memory of the species” (Prochiantz 1997, p. 148)—to species-specific pre-determined environments, the human being can indeed compensate for his “ultra-neotenic” condition of prematurity and overexposure (Mazzeo 2002), only by means of a sort of exaptation or primary cognitive *metapherein*. It can compensate for this condition only by transferring on the external environment the intra-specific coordinations, and the mediated structures of “sense”—intersensory and cognitive, affective and symbolic—linking it, from early childhood, to its peers. We must now notice that this communicative *transfert* has two primary consequences. If, on the one hand, it allows a great adaptive advantage, since it provides the human species with an openness to the world, namely flexibility and plasticity, that no other species knows, and that allowed it to populate the entire globe, keeping its (nomadic) “center” within itself, in its clan, language and culture, on the other hand, it gives rise to a withdrawal into the self and into their “intra-specific coordinations”, which is the basis of all anthropocentrism and anthropomorphism, ethnocentrism and cognitive, linguistic, cultural, political transcendentalism. Instead of demonizing it, anthropocentrism can be finally explained as the means by which man compromises with the *Open*. As recently observed by some researchers (De Carolis 2008), if the phase of withdrawal completely prevails over the one of opening, or vice versa, or if there is a clear dissociation of one phase from the other, there will be the rise of those individual and social pathologies that mark our times. Modern’s man need for identification of modern man with the machine, with nothingness or the animal provides an example of this phenomenon: partial communicative transfer, or division and rigid

expulsion of the opposite pole. The famous case of the autistic child Joey—who identified his organs and his body with a patchwork of machines, created by him, to stay alive and protect himself from the open—is paradigmatic in this sense.

However there is another fact that must be considered to account for this paradoxical need. The intra-specific hereditary coordinations that have enabled the human species to breed a neotenic offspring are not in themselves sufficient to assign a familial or social group's identity to individuals. To know who they are and how they must act collectively, in the course of their history, human groups have needed to identify themselves with symbolic and cultural institutions that have taken each time the aspect of the great wild animal to be hunted, the totemic animal, the god-kings of ancient Egypt, the word of the God of monotheism, the cyber-golem, using a socio-historical logic—an exapting, exonerating and communicative logic—similar to the one described above, in order to solve more and more complex needs.

Now, when the last great institutions of the past are wavering, including that institution on which all modern institutions should be based—the meta-institution of language—the human species seems to be faced with the choice of either imploding in its own neotenic nature, by assigning the prehuman semblance of a society of consumerist, couch potato bonobos to the human “fluid mass”, or alienating itself completely in its machinic prostheses, enslaving itself to a technoscientific scaffold, completely independent of human rationality. In other words, Nietzsche's prophecy of a humanity divided into a caste of masters and servants—unformed and malleable mass of people enslaved by the media to the technocratic elite that holds the world's destiny in its hands—seems to become an inexorable fate for the postmodern era. The only difference is that the elites in power seem to have now lost that freedom and creativity that Nietzsche still ascribed to them, as they obey a rational-technical language, now completely autonomous, that imposes its own anonymous and impersonal logic on those who are subjected to it, but also on those who use it.

Although rushed, the juxtaposition of the anthropo-biological logic of language with the logic of money can help to better understand what we mean. Just as language allows the body to be exempt from a set of direct experiences of the world by bearing the perceptual contents of the other senses, money allows the farmer not to worry about tomorrow's or next year's hunger, transforming, as Marx showed, some chosen goods into a symbolic universal medium of exchange. It is through this means that the farmer will not have to exchange his wheat crop as soon as he has finished his supply of wood or wine. In modern times, money thus sets itself up in an abstract system of equivalences in which the whole structure of relations that organize business is symbolically transposed: the hardships of work and the cares of need, the use-value of a product and its exchange-value, profit and wages etc. In other words, money, like language, is a technical means, selected by the species to release the body from the needs of the moment, and then exapting to produce more money and, abstractly, accumulate time. Contrary to what Weber claimed, the capitalist society is thus not the result of a religious ethic, historically determined, but, as Marx showed, the effect of a refunctionalization of an inter-

human form of mediation that ended up destroying and absorbing any other cultural and political institution. Becoming capital, money has in fact turned into an anonymous subject, into an “emerging social structure”—Gould would say—that pursues its goals in a totally autonomous way. And its being well adapted to the technological society depends on the fact that money itself has acquired the form of a symbolic-numerical mega-machine that, increasingly abstract and self-referential, now thinks for itself, rather than through man’s brain.

Something similar can be said also of language. Relieving the body of the direct experimentation of the world—and, in particular, exapting the identifying structure of the haptic sense by means of the name, and the characterising action of the eye by means of the predicate (Tugendhat 1976; Tomasello 2008)—the propositional language becomes the primary means by which the human being, from the great monotheistic religions up to the modern age, experience himself and the outside world. Invented, according to Michael Corballis 50,000 years ago for fun or by accident (Corballis 2002, p. 198), and selected due to its ability to consolidate the inter-specific relationships within the group, the phono-auditory language has a great advantage: it can be refined and tested in early childhood without appealing to any reality other than that of the sound produced by its voice and found to comply with the outcome anticipated in the imagination by its own hearing. But if, on the one hand, this advantage allows man to experience reality on the basis of expectations that he produces autonomously thanks to language, on the other hand, language is likely to lock up the human species in a world of increasingly abstract signs and metaphors separating consciousness from the body, man from man, the human species from nature and from the world. Empowered by writing and infinitely enhanced by digital technologies, the meta-institution of language seems to shatter into a variety of “niches” or “spheres” of meaning (Gould 2001, p. 108), in which every social group and each expert, whether scholar, philosopher or scientist, is imprisoned as a result of a sort of sensorimotor *loop* produced by the ability that the phono-auditory apparatus has to be self-sufficient. In conclusion, what awaits the postmodern man in the new millennium is a kind of collective autism where everyone protects himself in some way against *the open*: that is, against the undivided and becoming Totality that we evoked through Bohm at the beginning of this essay, and that, using Gould’s words, we might call, more simply, Nature. Does this therefore mean that a different relationship with Nature, understood as the open or as the “undivided and becoming Wholeness”, is more desirable and possible for the postmodern man? Or does it mean that despite our arguments, despite the efforts made by Gould and his followers to positive define what man is, the human enigma is still far from being solved?

It is now obvious to all of you that the gloomy and pessimistic picture that I have just outlined contrasts deeply with the personal and philosophical beliefs that accompanied Gould throughout his human, intellectual and scientific adventure. It contrasts with that belief or conviction that some commentators have rightly defined his Humanism: the idea that the human being realizes itself freely in history, the idea that history holds a meaning that transcends nature, which, as Darwin taught us, in itself makes no sense; the idea that the human being has

individual and collective responsibility to plan a better future in history for itself and its fellows (York and Clark 2011, pp. 91, 165, 183; Allmon 2009, pp. 27, 39). As we have tried to show, the image of history and the future that unfolds in the postmodern horizon, however, does not seem to confirm the unlimited creative and self-constitutive potential that Gould attributed to man because of his neotenic nature. Did one who throughout his life struggled more than any other against the closures in the specialized language of science, who more than anyone else tried to offer us a pluralistic and open image of nature, overestimate the man's potential? Or didn't he grasp the intrinsic limitations due to the fact that, in the human being, all freedom is a freedom obtained from nature through nature? That is, obtained by means of a trick that nature itself has taken many times during its course: exaptation? Or didn't he take sufficient account of the fact that denying a sense to nature, in the name of a materialist, contingentist and anti-anthropomorphic conception of nature, makes it extremely difficult to attribute any sense to man? In other words, we must ask, is it really possible to propose—as Gould claimed or attempted—a philosophy of nature which is totally de-anthropomorphized and anti-humanistic, and at the same time appeal to a humanistic image of man as regards the conception that we have of ourselves, of our liberty and our social and historical possibilities? All these questions should be carefully considered, not only by those who are philosophically interested in Gould, but also by those who care about the fate of post-modern man. For the time being, a simple and provisional answer would probably be enough. Neotenic heterochronie and neurobiological and cognitive exaptation are not only conditions of possibility of the human, but also of what has always been present in history and nowadays clearly reveals itself: the inhuman.

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