IDWRG

Innsbrucker Diskussionspapiere zu
Weltordnung, Religion und Gewalt

Nummer 04 (2005)

The Ethics of Technology before the Apocalypse

von
Jean-Pierre Dupuy
(Ecole Polytechnique Paris, Stanford University)

IDWRG

Innsbrucker Diskussionspapiere zu Weltordnung, Religion und Gewalt

Die **IDWRG** (*Innsbrucker Diskussionspapiere zu Weltordnung, Religion und Gewalt*) verstehen sich als unregelmäßige Reihe zur Veröffentlichung von wissenschaftlichen Arbeiten, die im Umfeld des Fakultätsübergreifenden Forschungsprojekts „Weltordnung – Religion – Gewalt" an der Leopold-Franzens-Universität Innsbruck entstanden sind.

Diese Reihe soll dabei helfen, aktuelle Fragen in diesem Spannungsfeld auf wissenschaftlichem Niveau zu diskutieren. Wie das gesamte Projekt möchte sie unterschiedliche Forschungsansätze im Blick auf große gesellschaftliche Probleme der Gegenwart zueinander in Beziehung bringen, und das sowohl ergänzenden als auch konfrontativ.

Themen und Methode sind daher grundsätzlich offen und frei. Beiträge aus dem Themenfeld in verschiedenen Stadien der Erarbeitung und Reaktionen auf Arbeiten sind jederzeit in der Leitung des Projekts oder der Redaktion der Reihe willkommen. Nur so kann dem Wesen einer Reihe von „Diskussionspapieren" auch entsprochen werden.

Die in den Arbeiten geäußerten Meinungen geben freilich jeweils die der Verfasser/innen wieder, und dürfen nicht als Meinung der Redaktion oder als Position des Projekts missdeutet werden.

Leiter des Forschungsprojekts: Wolfgang Palaver, Katholisch-Theologische Fakultät, Karl-Rahner-Platz 1, A-6020 Innsbruck, wolfgang.palaver@uibk.ac.at

Redaktion: Andreas Exenberger, Fakultät für Volkswirtschaft und Statistik, Universitätsstraße 15, A-6020 Innsbruck, andreas.exenberger@uibk.ac.at

Homepage: http://www2.uibk.ac.at/forschung/weltordnung/idwrg

The Ethics of Technology before the Apocalypse

Jean-Pierre Dupuy*

Raffiniert is der Herrgott, aber boshaft ist er nicht.[1]

Ein Teil von jener Kraft, die stets das Gute will, und stets das Böse schafft.[2]

Mephisto Revisited

In her 1958 *Human Condition*, Hannah Arendt wrote with extraordinary foresight: "The trouble concerns the fact that the 'truths' of the modern scientific world view, though they can be demonstrated in mathematical formulas and proved technologically, will no longer lend themselves to normal expression in speech and thought. […] it could be that we, who are earth-bound creatures and have begun to act as though we were the dwellers of the universe, will forever be unable to understand, that is, to think and speak about the things which nevertheless we are able to do. In this case, it would

* Jean-Pierre Dupuy is Professor of Social and Political Philosophy at the *École Polytechnique* in Paris, and Professor of French at the School of Humanities and Sciences in Stanford. Furthermore, he is Director of research at the C.N.R.S. (*Centre National de la Recherche Scientific*) and Director of C.R.E.A. (*Centre de Recherche en Épistémologie Appliquée*), the philosophical research group of the *École Polytechnique*, which he founded in 1982, and researcher at the C.S.L.I. (Center of Language and Information) at Stanford University. Dupuy is by courtesy Professor of Political Science. This text is a tribute to Father Raymund Schwager and was presented at November 25, 2005, at Innsbruck University as a "Raymund Schwager Religionspolitologische Vorlesung".

[1] Albert Einstein.

[2] Mephisto revisited, adapted from Goethe, *Faust*.

be as though our brain, which constitutes the physical, material condition of our thoughts, were unable to follow what we do, so that from now on we would indeed need artificial machines to do our thinking and speaking. *If it should turn out to be true that knowledge (in the modern sense of know-how) and thought have parted company for good*, then we would indeed become the helpless slaves, not so much of our machines as of our know-how, *thoughtless creatures* at the mercy of every gadget which is technically possible, no matter how murderous it is.[3]"

The expression "thoughtless creatures" coupled with the notion of technologies turned "murderous" sends a chill down the spine. We know that three years later, Arendt would witness the trial of Eichmann in Jerusalem and could find but one personality trait able to help explain his responsibility for the horror: "thoughtlessness."

Pondering over what he called our "blindness to the Apocalypse" in his landmark book, *Hiroshima ist überall* (1982) [Hiroshima is Everywhere][4], Hannah Arendt's first husband, Günther Anders, pointed to a similar discrepancy between *herstellen* and *vorstellen*: our capacity to make, to fabricate things goes well beyond our capacity to represent to ourselves what we are doing. What corresponds to Arendt's notion of thoughtlessness in Anders' analysis is the complete lack of imagination of modern man before the consequences of his technological inventions. Criminals without malignity and victims without hatred will constitute the normal correlates of future evils and future disasters, in the wake of such monstrosities as Auschwitz and Hiroshima – Nagasaki. "Technology has brought with it that we can become guiltlessly guilty", writes Anders

I should like to bring to bear those insights upon two major features of our world: 1) the decision to use the atomic bomb; 2) the transformation of the role of the engineer in the framework of the so-called "NBIC convergence" between nanotechnology, biotechnology, information technology, and cognitive science. The former illustration has to do with technologies of death, the latter with technologies of life. The most remarkable feature of our time is that that difference makes no difference.

---

[3] Hannah Arendt, *Human Condition*, The University of Chicago Press, 1958.

[4] Günther Anders, *Hiroshima ist überall*, C. H. Beck, Munich, 1982.

Faust famously asked Mephisto who he was, to get the following answer:

> Nun gut, wer bist du denn? - *Ein Teil von jener Kraft,*
> *Die stets das Böse will, und stets das Gute schafft*[5].

This definition of the Devil must be updated and become:

> *Ein Teil von jener Kraft,*
> *Die stets das Gute will, und stets das Böse schafft*.

If the technologies of life have become as dangerous and murderous as the technologies of death, this tells us something essential regarding the autonomy of technology in relation to the intentions and the will of those who devise, realize, and use it. I will end by reflecting upon this tragic dispossession of modern man regarding what Nietzsche called his *Wille zur Macht*, which is one with his *Wille zur Wille*.

Causing Death From Afar

In 1932, Günther Anders wrote a fable titled *Der Blick vom Turm* (The View from the Tower). Here is an excerpt:

> When Mrs. Glü peered down from the highest lookout tower, her son appeared in the street, like a tiny little toy. She recognized him by the color of his coat. The next moment a toy truck hit that little toy.
> But that event of a minute ago was no more than an unreal, brief accident, involving a broken toy. 'I don't want to come down!' she screamed, resisting fiercely as she was being led down the stairway. 'I don't want to go down! I'll go crazy down there!'[6]

Thirteen years later, in the morning of August 6th, 1945, the pilot Claude Eatherly was to give the "go ahead" signal to the crew of the "Enola Gay" to drop the atomic bomb on the Japanese city of Hiroshima which, seen from

[5] Translation: *Alright, who are you then? - part of the force that stood, / For always wanting Evil, but still creates the Good.*

[6] Quoted and translated by Paul van Dijk, *Anthropology in the Age of Technology. The Philosophical Contribution of Günther Anders*, Rodopi, Amsterdam, 2000, p. 8.

above at a safe distance of six miles, looked like a toy city. Back in his country, Eatherly was celebrated as a hero, along with his companions. However, he started to feel an incommensurable guilt for what he had done. The cognitive dissonance between his dismay about himself and the way people looked at him became intolerable. He claimed his "right to punishment". He committed sham holdups and was eventually declared "mentally ill". Anders started a correspondence with Eatherly, trying to convince him that, by reacting the way he did, he was eminently sane and behaved responsibly, but also that what had occurred far exceeded the accountability of any single human being[7]. Anders also wrote a letter to President Kennedy to protest the relegation of Eatherly's case to an instance of madness. He wrote:

> Happy the time in which fools speak thus, unhappy the time in which only fools speak thus! … Eatherly is not Eichmann's twin, but his great and, for us, comforting antipode. Not the man who proclaims machinery as excuse for lack of conscience but, on the opposite, the man who recognizes machinery as the threat to conscience that we must fear[8].

To view nuclear weapons as a strategic tool, that is, a means to an end, is for Anders the category mistake par excellence. A means merges with its end, it is absorbed by it. The atomic bomb is "absolutely too large" for that. Its effects, actual, potential, and virtual, are incommensurable with any end man can set for himself, since they include the possibility that humankind wipe itself out from the surface of the Earth. "*What limits us is the boundlessness of the consequences of our actions*. Omnipotence is our most fatal defect", Anders wrote in 1987. The very magnitude of those effects makes us completely blind to them. We are intrinsically unable to relate emotionally and intellectually to such gigantic monstrosities. When we are being told that our nation is preparing to kill twenty million children in another nation if the worst should come to the worst, we remain as cold as ice. In Anders' words, the very gigantism and abstraction of the enunciation of such consequences transmogrifies us into "emotional illiterates."

---

[7] This correspondence was published with the title *Off Limits für das Gewissen: Der Briefwechsel zwischen dem Hiroshima-Piloten Claude Eatherly und Günther Anders 1959-1961*, with an introduction by Robert Jungk; and reprinted in *Hiroshima ist überall*, (Reference 4).

[8] Quoted by Paul van Dijk, ibid., p. 63 (Reference 6).

The B29 that carried the team of scientists in charge of observing and measuring the effects of the explosion of the bomb, on that fateful morning of August 6, 1945, was named *Necessary Evil*. These are details or trappings that nobody could make up even if they willed. Hence the contribution of science to the massacre was placed under the honorable label of ethics and moral philosophy. However, this was a charade, a travesty.

Indeed, even today, 90% of the American population believe that the atomic bombings were the price to be paid in order to save the lives of half-million or more American troops, not to mention the Japanese, who would have been killed had the planned invasion of Kyushu on November 1, and then of Honshu the next year, taken place. Sparing those many lives was worth violating (not for the first time, to be sure) the time-honored most basic precepts of Just War Theory.

Unfortunately for that legend, most serious historians now acknowledge that, to use the words of one of them who is not, by far, the most radical "revisionist", "it does seem very likely, though certainly not definite, that a synergistic combination of guaranteeing the emperor, awaiting the Soviet entry, and continuing the siege strategy would have ended the war in time to avoid the November invasion.[9]" In other terms, to say the least, Truman in no way exhausted the possibilities of bringing the war to an end without dropping the atomic bombs on Japan. Barton Bernstein goes so far as to assert that the only option that was not examined or discussed, because it was taken for granted, was precisely the use of nuclear weapons. Hence, what may be the most important and era-opening decision of modern history turns out not to have been a decision at all. Anders was right: the bomb is no means to an end, its essence is in its existence, not in its use.

The doctrine of nuclear deterrence known as MAD (i.e. Mutually Assured Destruction) is a perfect illustration of that claim. In January 2000, President Clinton paid a visit to President Poutin. Clinton's task was to convince his partner that the anti-missile shield that the US was planning on setting up would not prevent Russia from being able to destroy American society if it

[9] Barton J. Bernstein, "Understanding the Atomic Bomb and the Japanese Surrender: Missed Opportunities, Little-Known Near Disasters, and Modern Memory", *Diplomatic History*, vol. 19, no 2 (spring 1995), p. 227-273 [p. 254].

had to. The shield, Clinton explained, would be thick enough to stop ballistic missiles launched by rogue states, but thin enough to be easily penetrated by the Russian missiles (but also the Chinese ones). In other terms, MAD entails the abandonment of the military defense of one's nation: the policy of deterrence does not contemplate doing anything in defense of the homeland. In fact, it positively requires that each side leaves its population open to attack, and makes no serious effort to protect it. The safety can be only as great as the terror is. If the terror were to be diminished – by, for example, building bomb shelters that protected some significant part of the population – then safety would be diminished, too, because the protected side might be tempted to launch a holocaust, in the belief that it could "win" the hostilities. In MAD "destruction" must, perversely, be "assured", as though our aim were to destroy, and not to save, humankind.

All these features of MAD run so consistently counter to the far simpler, more familiar, and emotionally more comprehensible logic of traditional military thinking – not to mention instinct and plain common sense – that the deterrence doctrine, when it was being applied, was constantly under challenge from traditional doctrine. The hard-won gains of deterrence were repeatedly threatened by a recrudescence of the old desire for victory, for national defense in the old sense, and for military superiority.

For a long time, strategic thinking had it that nuclear deterrence rested on an *intention*: the threat to blow up the whole world into an apocalyptic ending were the adversary to take a step forward. There were many problems with the internal consistency of that theory, not to mention its blatant immorality: isn't the readiness to kill sixty million innocent people frighteningly close to killing them for real? One of the major problems had to do with the very credibility of the threat. As Jonathan Schell puts it:

> Since in nuclear-deterrence theory the whole purpose of having a retaliatory capacity is to deter a first strike, one must ask what reason would remain to launch the retaliation once the first strike had actually arrived. It seems that the logic of the deterrence strategy is dissolved by the very event – the first strike – that it is meant to prevent. Once the action begins, the whole doctrine is self-canceling. It would seem that the doctrine is based on a monumental logical mistake: one

> cannot credibly deter a first strike with a second strike whose raison d'être dissolves the moment the first strike arrives.

The solution came with a name: *existential* deterrence. The intention or threat to retaliate and launch a counter-attack that will lead to the Apocalypse is the problem? Let us get rid of the intention. As two major philosophers put it, "The existence of a nuclear retaliatory capability suffices for deterrence, regardless of a nation's will, intentions, or pronouncements about nuclear weapons use." [Gregory Kavka]; or: "It is our military capacities that matter, not our intentions or incentives or declarations." [David K. Lewis]. If deterrence is existential, it is because the existence of the weapons alone deters. Deterrence is inherent in the weapons because "the danger of unlimited escalation is inescapable." As Bernard Brodie put it in1973:

> It is a curious paradox of our time that one of the foremost factors making deterrence really work and work well is the lurking fear that in some massive confrontation crisis it may fail. Under these circumstances *one does not tempt fate*. If we were absolutely certain that nuclear deterrence would be 100 percent effective against nuclear attack, then it would cease to have much if any deterrence value against non-nuclear wars.

The kind of rationality at work here is not a calculating rationality, but rather the kind of rationality in which the agent contemplates the abyss and simply decides never to get too close to the edge. As David Lewis puts it: "You don't tangle with tigers – it's that simple." The probability of error is what makes deterrence effective. But error, failure or mistake, here, is not strategic. It has nothing to do with the notion that a nation, by irrationally running unacceptable risks, can limit a war and achieve advantage by inducing restraint in the opponent. This idea – known as the "rationality of irrationality" theory, was popularized by Thomas Schelling in his landmark *Strategy of Conflict*, published in 1960. Here, on the other hand, the key notion is "*Fate*". The error is *inscribed* in the future. In other terms, the game is no longer played between two adversaries. It takes on an altogether different form. The game is played between one actor, humankind, whose survival is at stake, and its double, namely its own violence exteriorized in the form of fate. The tiger we'd better not tangle with is nothing other than the evil that is in us but that we do not recognize as such: it is as if we were threatened by

an exceedingly dangerous entity, external to us, whose intentions toward us are not evil, but whose power of destruction is infinitely superior to all the earthquakes or tsunamis that Nature has in reserve for us.

Heidegger famously said, "Nur noch ein Gott kann uns retten". In the nuclear age, this (false) God is the self-externalization of human violence into a nuclear holocaust inscribed in the future as both accident and destiny. Günther Anders thought that August 6, 1945 marked the beginning of the final time in the history of humankind[10]. Even if we manage to put off the tragic ending endlessly, its monstrous shadow projects itself back onto the present and we live on borrowed time: "Even if it never happens, the possibility of our definitive destruction is the definitive destruction of our possibilities", writes Anders in *Die Atomare Drohung*[11]. Our life is condemned to be no more than a reprieve – *eine Frist*. We've lost our innocence for ever. Not even a total disarmament would save us: we would not have the weapons, but we would keep the know-how, and everyone would rush to be the first to rearm and preempt the others from doing so by striking them first. Anders concludes: we have become the "masters of the apocalypse", that is, we are omnipotent, but this "negative omnipotence" is undistinguishable from a complete impotence[12].

Making Life From Scratch

"Making life from scratch": few are the "nanobiotechnologists" who have the honesty or the boldness to claim that this phrase expresses what they are really after[13]. Whether this agenda remains hidden or not, there is no doubt that such is indeed the metaphysics that drives their efforts. The "NBIC converging technologies" purport to take over Nature's and Life's job and be-

[10] Günther Anders, *Endzeit und Zeitenende*, Munich, C. H. Beck, 1972.

[11] Günther Anders, *Die atomare Drohung*, Munich, C. H. Beck, 1981, a new edition of *Endzeit und Zeitenende* (Reference 10).

[12] Günther Anders, *Die Antiquiertheit des Menschen*, Munich, C. H. Beck, 1980.

[13] Among them, the Center for Living Technology and ProtoLife Srl, in Venice (Italy). See Steen Rasmussen et al, "Transitions from Nonliving to Living Matter", *Science*, vol. 303, 13 Febr. 2004, 963-965.

come the engineer of evolution. Evolution so far has basically consisted in mere "tinkering". It can lock itself in undesirable paths or end states. It is therefore desirable for Man to take over the role played by Evolution and become the designer of biological and natural processes. *Man can participate in the fabrication of life.*

Scientists and engineers who adopt this agenda are, whether they know it or not, heirs to a famous conjecture put forward by John von Neumann in a classic lecture that he gave at Caltech in 1948, his conjecture on complexity and self-reproducing automata.

Turing's and Church's theses were very influential at the time, and they had been supplemented by cyberneticians Warren McCulloch and Walter Pitts' major finding on the properties of neural networks. Cybernetics' Credo was then: every behavior that is unambiguously describable in a finite number of words is computable by a network of formal neurons---a remarkable statement, as John von Neumann recognized. However, he put forward the following objection: is it reasonable to assume as a practical matter that our most complex behaviors are describable in their totality, without ambiguity, using a finite number of words? In specific cases it is always possible: our capacity, for example, to recognize the same triangular form in two empirical triangles displaying differences in line, size, and position can be so described. But would this be possible if it were a matter of globally characterizing our capacity for establishing "visual analogies"? In that case, von Neumann conjectured, *it may be that the simplest way to describe a behavior is to describe the structure that generates it.* It is meaningless, under these circumstances, to "discover" that such a behavior can be embodied in a neural network since it is not possible to define the behavior other than by describing the network itself.

Von Neumann thus posed the question of complexity, foreseeing that it would become the great question for science in the future. Complexity implied for him in this case the futility of the constructive approach of McCulloch and Pitts, which reduced a function to a structure---leaving unanswered *the question of what a complex structure is capable*.

It was of course in the course of his work on automata theory that von Neumann was to refine this notion of complexity. Assuming a magnitude of a

thermodynamical type, he conjectured that below a certain threshold it would be degenerative, meaning that the degree of organization could only decrease, but that above this threshold an increase in complexity became possible. Now this threshold of complexity, he supposed, is also the point at which the structure of an object becomes simpler than the description of its properties. Soon, JVN prophesied, the builder of automata would find himself as helpless before his creation as we feel ourselves to be in the presence of complex natural phenomena.[14]

At any rate, JVN was thus founding the so-called *bottom-up approach* that is the essence of the NBIC program. In keeping with that philosophy, the engineers of the future will not be any more the ones who devise and design a structure capable of fulfilling a function that has been assigned to them. The engineers of the future will be the ones who know they are successful when they are surprised by their own creations. If one of your goals is to reproduce life, to fabricate life, you have to be able to simulate one of its most essential properties, namely the capacity to complexify itself always more.

It would be a mistake to think that, although novel, our current situation before the consequences of our technological choices is not the outcome of a long historical process. Discontinuities and ruptures must always be analyzed against the background of continuous dynamics. Let us return once more to Hannah Arendt's masterly study of the frailties of human action, *Human Condition*. There she brought out the fundamental paradox of our time: as human powers increase through technological progress, we are less and less equipped to control the consequences of our actions. A long excerpt is worth quoting here, as its relevance for our topic cannot be overstated – and we should keep in mind that this was written in 1958:

> [...] the attempt to eliminate action because of its uncertainty and to save human affairs from their frailty by dealing with them as though they were or could become the planned products of human making has first of all resulted in channeling the human capacity for action, for beginning new and spontaneous processes which without men never would come into existence, into an attitude toward nature which up to

[14] On all that, see Jean-Pierre Dupuy, *The Mechanization of the Mind*, Princeton University Press, 2000.

> the latest stage of the modern age had been one of exploring natural laws and fabricating objects out of natural material. To what extent we have begun to *act into nature*, in the literal sense of the word, is perhaps best illustrated by a recent casual remark of a scientist who quite seriously suggested that "*basic research is when I am doing what I don't know what I am doing*." [Wernher von Braun, December 1957].
>
> This started harmlessly enough with the experiment in which men were no longer content to observe, to register, and contemplate whatever nature was willing to yield in her own appearance, but began to prescribe conditions and to provoke natural processes. What then developed into an ever-increasing skill in *unchaining elemental processes*, which, without the interference of men, would have lain dormant and perhaps never have come to pass, has finally ended in a veritable art of *'making' nature*, that is, of creating 'natural' processes which without men would never exist and which earthly nature by herself seems incapable of accomplishing [...].
>
> The very fact that natural sciences have become exclusively sciences of process and, in their last stage, *sciences of potentially irreversible, irremediable 'processes of no return'* is a clear indication that, whatever the brain power necessary to start them, *the actual underlying human capacity which alone could bring about this development is no 'theoretical' capacity, neither contemplation nor reason, but the human ability to act* – to start new unprecedented processes whose outcome remains uncertain and unpredictable whether they are let loose in the human or the natural realm.
>
> In this aspect of action [...] processes are started whose outcome is unpredictable, so that *uncertainty rather than frailty becomes the decisive character of human affairs*[15].

No doubt that with an incredible prescience this analysis applies perfectly well to the NBIC convergence, in particular on two scores. Firstly, the ambition to (re-) make nature is an important dimension of the metaphysical underpinnings of the field. Secondly, as explained before, it will be an inevitable temptation, not to say a task or a duty, for the nanotechnologists of the future to set off processes upon which they have no control.

[15] Arendt, *Human Condition*, pp. 230-232, emphasis added (Reference 3).

There is no need for Drexlerian self-assemblers to come into existence for this to happen. The paradigm of *complex, self-organizing systems* envisioned by von Neumann is stepping ahead at an accelerated pace, both in science and in technology. It is in the process of shoving away and replacing the old metaphors inherited from the cybernetic paradigm, like the ones that treat the mind or the genome as computer programs. In science, the central dogmas of molecular biology received a series of severe blows recently, first with the discovery that the genome of an adult, differentiated cell can be "reprogrammed" with the cooperation of maternal cytoplasm, secondly with the discovery of prions, which showed that self-replication does not require DNA. In technology, new feats are being flaunted every passing week that illustrate that we can *fabricate* self-organizing, complex entities.

The sorcerer's apprentice myth must be updated: it is neither by error nor by terror that Man will be dispossessed of his own creations but *by design*.

Setting limits

The reconceiving of life as an artifact, as something that can be fabricated, has obviously important ethical and epistemological implications. It is interesting to analyze what the promotors of the NBIC convergence imagine to be the stance of those they take to be their "enemies," or at the very least their critics. The same words are always used to sum up this presumed stance: human beings do not have the right to usurp powers reserved to God alone; *Playing God* is a forbidden game. Often it is added that this taboo is specifically "Judeo-Christian." In one of his most insightful reflections on his responsibility in the bombings of Hiroshima and Nagasaki, Oppenheimer said in 1965, echoing in a way this imputation:

> Long ago, I said once that in a crude sense … the physicists had known sin. I didn't mean by that the deaths that were caused as a result of our work. I meant that we had known the *sin of pride*. We had turned to effect in what proved to be a majority way the course of man's history.

> We had the pride of thinking we knew what was good for man […] This is not the natural business of a scientist[16].

The reference to the "Judeo-Christian", I am afraid, completely misconstrues the lesson of the Talmud as well as that of Christian theology. It gets them mixed up with the ancient Greek conception of the sacred: the Gods, jealous of men guilty of *hubris*, send after them the goddess of vengeance, *Nemesis*. But the Bible depicts man on the contrary as being the co-creator of the world. As the biophysicist and Talmudic scholar Henri Atlan notes when analyzing the literature about the Golem: "One does not find [in it], at least to begin with, the kind of negative judgment one finds in the Faust legend concerning the knowledge and creative activity of men 'in God's image.' Quite to the contrary, it is in creative activity that man attains his full humanity, in a perspective of *imitatio Dei* that allows him to be associated with God, in a process of ongoing and perfectible creation."[17] As to Christianity, a whole series of major authors, from Max Weber to Louis Dumont, from Marcel Gauchet to René Girard, have analyzed it as "the religion of the end of religion": they hold it responsible for the desacralization of the world (the famous "disenchantment"), and, consequently, for the progressive elimination of every taboo, prohibition or limit. This, moreover, is why the same authors view Christianity as the primary cause of the scientific and technical development of the West, for science and techniques depend precisely on the overcoming of every limit.

It fell to science itself to pursue this desacralization of the world set in motion by the religions of the Bible, by stripping nature of any prescriptive or normative value. It is therefore utterly futile to try to paint science as being at odds with the Judeo-Christian tradition on this point. Kantianism conferred philosophical legitimacy on this devaluation of nature by making the latter a world devoid of intentions and reasons, inhabited only by causes, and by separating it radically from the world of freedom, where the reasons for action fall under the jurisdiction of moral law.

---

[16] Interview on CBS News, 5 August 1965. Quoted by Bernstein, "Understanding the Atomic Bomb …", p. 270 (Reference 9).

[17] Henri Atlan, *Les Etincelles de hasard*. Tome 1: *Connaissance spermatique*, Paris, Seuil, 1999, p. 45.

Where then is the ethical problem located, if there is one here? It is clearly not in the transgression of who knows what taboo or limit guaranteed by the sacred, since the joint evolution of religion and science has thoroughly undermined the very concept of a moral limit, and hence of a transgression. But that is precisely the problem. For no free and autonomous human society exists which does not rest on a principle of *self*-limitation, even when it believes it has received this principle from some kind of transcendent authority. Rousseau and then Kant defined freedom or autonomy as obedience to the law one gives oneself. Rousseau wanted the laws of the political community to have the same exteriority with respect to men as the laws of nature, even though it is men who make the former and even though they know this. But in a society that dreams of shaping and molding nature to its desires and needs, it is the very idea of an exteriority or alterity which loses all meaning. The substitution of the made for the given is obviously a part of this same process. Traditionally, nature was defined as what remained exterior to the human world, with its desires, its conflicts, its various depravities. But if, in our dreams, nature becomes entirely what we make of it, it is clear that there is no longer anything exterior, so that everything in the world will sooner or later reflect what men have done or not done, sought or neglected.

How are we going to set limits? On what are we going to ground them, in the absence of any form of legitimizing authority other than our own agreement? This is the most important challenge of our times.

I have no ready-made solution to offer. What I know for sure is that we will always keep the liberty to set limits to ourselves. In other terms, I do not advocate any form of technological determinism. It is only when some critical thresholds are crossed that everything happens *as if* we were the puppets of our own creations. The philosopher who ponders over this self-inflicted alienation must discard the temptation of sociological analysis. He fully endorses the claim that "science is not neutral", but he gives this phrase a meaning altogether different from the idea that science and technology are embedded in a social context and interact with it. If Anders is right, any leader other than Truman would probably have made the decision he made: possessing the bomb meant using it. Anders was a radical thinker, but an historian as subtle and moderate as Barton Bernstein says as much when he ends his analysis thus:

> [there is little reason] to conclude that the leaders or most citizens of any of the other major wartime powers – Britain, the Soviet Union, China, Japan, or Germany – would have sought to avoid dropping the bomb on the enemy and its non-combatants. Painfully, it seems necessary to conclude that America was unique primarily because it alone possessed the bomb, and it did use it[18].

If von Neumann is right, similarly, there will necessarily be a "social context" that will cause the decision to "make life from scratch" to be successful. The top priority, it seems to me, is for us to ask, will we then still be able to think through what we are doing? Won't we have irreversibly turned into those "thoughtless creatures" Hannah Arendt so much feared we might become?

The remaking of the world and the mystery of love

Since we are in Austria, I would like to pay tribute in conclusion to a great friend of mine, the late Heinz von Foerster, a Viennese Jewish immigrant to the United States who would found second-order cybernetics after having served as secretary to the Macy Conferences, which were the cradle of the first cybernetics.

Heinz loved to tell the following story, a true story that took place in Vienna toward the end of 1945. The story concerns another Viennese Jew, the psychiatrist Viktor Frankl, the celebrated author of *Man's Search for Meaning*. Frankl had just returned from the Auschwitz-Birkenau camp, having miraculously survived, he had discovered that his wife, his parents, his brother and other members of his family had all been exterminated, and he had decided to resume his practice.

Here is the story as my friend Heinz told it to me:

> Concentration camps were the setting for many horrific stories. Imagine then the incredulous delight of a couple who returned to Vienna from two different camps to find each other alive. They were together

[18] Bernstein, "Understanding the Atomic Bomb …", p. 268 (Reference 9).

> for about six months, and then the wife died of an illness she had contracted in the camp. At this her husband lost heart completely, and fell into the deepest despair from which none of his friends could rouse him, not even with the appeal of "Think if she had died earlier and you had not been reunited!". Finally he was convinced to seek the help of Viktor Frankl, known for his ability to help the victims of catastrophe.
> They met several times, conversed for many hours, and eventually one day Frankl said: "Let us assume God granted me the power to create a woman just like your wife: she would remember all your conversations, she would remember the jokes, she would remember every detail: you could not distinguish this woman from the wife you lost. Would you like me to do it?" The man kept silent for a while, then stood up and said "No thank you, doctor!" They shook hands; the man left and started a new life.
> When asked by von Foerster about this astonishing and simple change, Frankl explained, "You see, Heinz, we see ourselves through the eyes of the other. When she died, he became blind. But when he *saw* that he was blind, he could see!"[19]

Such at least is the lesson that von Foerster drew from this story, in typical cybernetic fashion. But I think that another lesson can be drawn from it which extends the first. The thought experiment to which Frankl subjected his patient echoes one of the most famous Greek myths, that of Amphitryon. In order to seduce Amphitryon's wife, Alcmena, and to pass a night of love with her, Zeus assumes the form of Amphitryon. "All through the night, Alcmena loves a man whose qualities are in every particular identical to those of her husband. The self-same description would apply equally to both. All the reasons that Alcmena has for loving Amphitryon are equally reasons for loving Zeus, who has the appearance of Amphitryon, for Zeus and Amphitryon can only be distinguished numerically: they are two rather than one. Yet it is Amphitryon that Alcmena loves and not the god who has taken on his form. If one wishes to account for the emotion of love by the propositions that justify it or by the qualities attributed to the objects of love, what rational explanation can be given for that "something" which Amphitryon

[19] "Wir sehen uns mit den Augen des anderen. […] Als er aber erkannte, daß er blind war, da konnte er sehen!" The story is from the Von Foerster Archives in Vienna.

possesses but not Zeus and which explains that Alcmena's love is directed only at the former and not the latter?"[20]

When one loves somebody, one does not love a list of characteristics, even were it to be sufficiently exhaustive to distinguish the person in question from everyone else. The most perfect *simulation* still fails to capture something, and it is this "something" which is the essence of love, that poor word that says everything and explains nothing. I greatly fear that the spontaneous ontology of those who wish to be the makers or re-creators of the world knows nothing of the beings who inhabit it but lists of characteristics. If ethics is the least bit related to love, its "supervenience base," to use the jargon of analytic philosophy, is condemned, by this ontology, to remain fundamentally incomplete.

[20] Monique Canto-Sperber, entry "Amour" in the *Dictionnaire d'Ethique et de philosophie morale*, M. Canto-Sperber (ed.), 4th edition, Paris, Presses Universitaires de France, 2004.

Übersicht über bisher erschienene Nummern:

2005

01 **Raymund Schwager** (Universität Innsbruck): *Jean-Pierre Dupuy als möglicher Referenzautor für das interfakultäre Forschungsprojekt „Weltordnung-Religion-Gewalt".*

02 **Jörg Becker** (KommTech Solingen und Universität Marburg): *Die Informationsrevolution frisst ihre eigenen Kinder: Internationale Medienpolitik zwischen Terror, Militarisierung und totaler Entgrenzung.*

03 **Andreas Exenberger** (Universität Innsbruck): *Eine Weltordnung des Hungers? Nahrungsmittelknappheit im Zeichen der Globalisierung.*

04 **Jean-Pierre Dupuy** (Ecole Polytechnique Paris und Stanford University): *The Ethics of Technology before the Apocalypse.*