Chapter 2
Defining Bioethics: Back to the Sources

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1 Introduction: What Is Defining?

To define is not an activity that is foreign to philosophy. Quite the contrary: it is constitutive of much of it, and has been present from its origins. Plato, through the voice of Socrates, was basically seeking definitions: what is virtue, beauty, courage, piety, philosophy…? He did not want us to respond by a series of examples of acts, or brave or virtuous men, or beautiful works. He wanted the idea itself be presented: the very essence itself of courage or beauty. He expected a definition imposed by reality itself: the one reality, perfect, immutable, universal. Put in a different manner, Plato sought an ontological definition. These types of definitions also carry a normative scope: they express the ideal and the truth-value that sensible empirical realities cannot approach.

The desire for the real, essential and necessary definition that should prevail over all can be found throughout the history of philosophy and to a certain degree in science. From Platonic idealism, this desire is perpetuated through substantialist Aristotelian essentialism, Cartesian rationalism, critical and transcendentalist Kantianism, logicism and phenomenological eideticism, etc.

I have for quite a long time distanced myself from this powerful essentialist tradition, too often dogmatic, in favor of a more empiricist approach that is more widespread in European Anglo-Saxon thought than in what is called Continental (meaning for the most part French and German) philosophy. My way of

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approaching the problem of definition is, and for a long time has been, inspired by the philosophical work of Ludwig Wittgenstein. Wittgenstein takes, specifically, the example of the word "game." What is a game? For the illusory desire to free the concept or the essential meaning, Wittgenstein substitutes a more modest goal—tolerant, pluralistic and open—a family of uses.

When considering what are called "games," we can see an enormous variety of examples, cases, and contexts of use. Here it seems pointless to want to repeat the Platonic gesture which claims to see the uniqueness of an idea behind or beyond this diversity, an essential trait common to all. Between all the myriad uses of the word "game" there are of course similarities, as there are always similarities between members of a family. But these similarities are many and no one characteristic is necessary and shared by all. If A, B, C, D, E, F, etc. are examples of games, it is perfectly plausible that A, C, D and M share the characteristics alpha, beta and gamma, but only C and D have in common with D, E, F and G, the characteristics delta and epsilon, or even that D and J have in common the lambda and mu characters, and so on. A, therefore does not have a common trait with J, but is connected to J via D. Thus, the series holds together, loosely but at the same time quite firmly. It is not, Wittgenstein observes again, because a single fiber runs throughout the rope that it is resistant. It is the collection of several fibers of limited length that makes its sturdiness.[1]

Certainly, in a family, some characteristics are more common than others and it is usually possible to reach a core that is more representative of games examples, i.e. a paradigmatic core nucleus. But this by no means indicates that when one characteristic is particularly widespread, or even present everywhere, we have a clear criterion of what a game is. Suppose, for example, we could say that all games are entertaining or governed by rules. But what is it to be "entertaining"? We certainly do not all entertain ourselves in the same manner and under the same circumstances. What is a game for one is not for another. And what is a rule? There are many kinds of rules and ways to follow them: administrative, legal, moral, aesthetic, logical, mathematical, technical, and monastic. "Rules," "entertainment," "game" all are terms that correspond to families of uses, not clearly defined and unchanging concepts, and these families of usage variously intersect.

When one navigates through the uses of the word "Bioethics"[2] and the various definitions that are given, we are confronted with a similar kind of "family" in the

[1]On this point see Wittgenstein (2009), Philosophical Investigation no. 66.

[2]See, for example, Callahan (1973); In the first edition of the *Encyclopedia of Bioethics* (1978) the definition written by Danner Clouser is essentially a vehicle for the message that bioethics is nothing more than the application of traditional ethics to new aspects of ancient problems raised by developments in medicine: "The position taken in this article has been that the revelations and capabilities mediated by science create an urgency for moral guidance but do not require a new morality, revised in its basic principles" (vol. 1, p. 125). It mentions, very briefly, Potter, who as we will see below is an opponent of this view. Instead of defining bioethics in its essence, better to characterize it as relative to a series of questions sharing some "family resemblances." But Clouser is not content to stop at this, nor does he mention Wittgenstein. In the second edition of the Encyclopedia (1995), the entry on "Bioethics" was written by Daniel Callahan, a Catholic

sense that Wittgenstein describes. This situation does not prevent proponents of the various definitions of bioethics from claiming to present the true or the single proper definition, without realizing or wanting to admit the interested, partial, biased, subjective, normative or even outright controversial nature of their proposals. Of course, it is entirely legitimate, in specific contexts (technical, scientific, educational, etc.), to cut loose semantic tissue from clearly defined meanings and purposes. But these are normative rational decisions, whose products are largely constructed and not given by a reality or common sense that would be all encompassing, and that claims simply to discover and to explain.

In philosophy there is also another manner of revealing reveal the "true meaning" of words that is equally as old—it is found as early as Plato's *Cratylus*. This approach had a major success in the twentieth century, especially in the hermeneutics inspired by Heidegger. It seeks the original meaning of a word by tracing its history through a language or a succession of languages, as is the case for the philosophical terms: "reason," which refers to *ratio*, which in turn refers to *logos*; or "nature" which refers to *natura* which refers to *physis*; "morality," which refers to *mos*, which refers to *ethos,* etc. The hermeneutic looks at how these terms were used and what they meant in the early presocratic philosophical texts. This undertaking is of an undeniable philological and historical interest, but it also participates in an almost mythological valorization of origin (think of a Golden Age) where truth and meaning would have shined only to have faded and been lost during the subsequent history. It is a process of recovery of the past, of tradition and of nature and it may prove to be as dogmatic as essentialist idealism, because it is still pretending to read the real and unique signification without assuming active responsibility in this normative discovery.

"Bioethics" is a constructed word; a dated artifact whose paternity is known[3] and it seems to somehow evade the temptation to trace its origin very far into the past.

(Footnote 2 continued)
philosopher benefiting from a broader historical perspective. This entry is much richer than the first and illustrates the vast diversity that we find in the use of the word at the end of the twentieth-century, encompassing medical ethics, environmental ethics, social and political questions (biopolitics). Bioethics here concerns the "sciences of living." Potter is acknowledged as the inventor of the word, but only one paragraph is devoted to him. Callahan strongly insists on the interdisciplinary character of bioethical inquiry, however he maintains that it runs primarily on insights from various branches of moral philosophy (consequentialism, deontological principalism, virtue ethics, casuistry, feminism, narrative approaches, hermeneutics, etc.), while emphasizing that a practical agreement on narrow questions does not postulate a theoretical agreement on the ultimate philosophical foundations or theological justifications. *The Birth of Bioethics* (1998) is also an essential reference for the formation and history of bioethics, both the term and the field of study. Its author, Albert R. Jonsen is close to the Georgetown group (discussed below). But again, his mention of Potter is minimal. This is a brief and incomplete account of the formation of the term and field—bioethics, but I thought it helpful to point out several significant landmarks.

[3]I have recently discover the use of the term "Bio-Ethic" by the protestant theologian Fritz Jahr in a text from 1927, but it is a hapax and did not have any influence on the history of bioethics that started in the 1970s. I do not deny the existence of a pre-history of bioethics that can be traced back to antiquity.

But the components and amalgam that it uses—Greek roots "bios" and "ethos"—are inherited from a millenary tradition. It would be an interesting and curious exercise to apply to the word "bioethics" the methodology of etymological hermeneutics in going back towards the original meanings of bios and ethos and seeking to find to what extent these words meet and are linked. This path would willingly borrow a Heideggerian ending, probably leading to the conclusion that whoever coined the word "Bioethics" did not know himself what he was doing by bringing these ancient Greek roots together to forge the neologism.

It is Van Rensselaer Potter who first developed the term "bioethics," without the hermeneutic exercise dear to certain strains of twentieth century Continental philosophy. However, simply blaming Potter's philologico-philosophical ignorance would be too pretentious and, in addition, unfair. As we shall see, Potter advanced with a clear understanding that he was constructively defining something new, for which he assumed responsibility and which aimed at the future, not the past.

2 Bioethics According to Its Inventor

Here are the first lines of Van Rensselaer Potter's book *Bioethics. Bridge to the Future* (1971) where the term "bioethics" was coined forty years ago:

> The purpose of this book is to contribute to the future of the human species by promoting the formation of a new discipline, the discipline of Bioethics. If there are "two cultures" that seem unable to speak to each other—science and the humanities—and if this is part of the reason that the future seems in doubt, then possibly, we might build a "bridge to the future" by building the discipline of Bioethics as a bridge between the two cultures. […] What we must now face up to is the fact that human ethics cannot be separated from a realistic understanding of ecology in the broadest sense. Ethical values cannot be separated from biological facts. We are in great need of a Land Ethic, a Wild Life Ethic, a Population Ethic, a Consumption Ethic, an Urban Ethic, an International Ethic, a Geriatric Ethic, and so on. All […] call for actions that are based on values and biological facts […]. (Potter 1971, pp. VII–VIII).[4]

These few lines contain crucial indications. The aim is the future: not the near future and not just any future prospects, but the survival of the human species in the long term and taking into account, which he specifies later, requirements for the quality and improvement of life.

The problem is one of "two cultures," referring to Snow's famous lecture (2001). Himself both a scientist and writer, Snow observed a very deep divide between proponents of literary disciplines and those of the technical and scientific disciplines between which there is no communication and no shared vision of the world. Associated with this harmful dichotomy that continued to widen in the twentieth century, there is another older opposition that is itself partly constitutive of modernity (see for example, Galileo, Hume): the radical separation between fact and value.

[4]The term had already appeared in an article from 1970, "Bioethics, The Science of Survival", this article was integrated into the 1971 book.

Bioethics is introduced as a response to legitimate concerns regarding the future of humanity, and it seeks to do so by building a bridge between the two cultures, denouncing their dangerous mutual ignorance and the cleavage between facts and values. Recognizing that one cannot separate individual and collective action based on values and standards on one hand, and knowledge of the laws and scientifically proven facts that shed light on the conditions and the actual consequences of the action on the other, is at the heart of the solution to the problem of the two cultures and its devastating effects. An ethics (from personal morality to politics) that inspires action cannot ignore facts that are established through biological knowledge.

Bioethics is thus defined as the discipline that builds bridges: a bridge from the present to the future by means of a bridge between two cultures, between facts and values. It is in this sense a discipline that appears therefore as inter- or multidisciplinary, and particularly broad in the range and scope of issues it addresses and the resources it uses to do so. But we must also proceed with a clear understanding that the failures stemming from the problem of "two cultures" are not just on one side, i.e. that of those in the literary and intellectual world of the Humanities who ignore the hard sciences. Scientists must share the responsibility. This is in no small part due to the hyper-specialization of which Potter himself is a lucid representative: trained as a chemist, he became a specialist in some specific aspects of certain type of cancer: "Thus, I began as a chemist, then chose biochemistry, then the biochemistry of cancer, then the biochemistry of one kind of cancer, and I am presently interested in special aspects of that biochemistry" (Potter 1971, p. 150). At the end of his *Preface,* he observes that the range of readings of a specialist is reduced as his specialization is increasingly narrowed to this absurd conclusion where we become the only expert of a hyper-specialized domain, "we read only what we write" (VIII).

Thus Potters's bioethics corresponds to what is today sometimes called "macrobioethics": it concerns human health problems, taking into account social, cultural and natural environments. It is an ecological or global approach to bioethics. The long-term survival of the human species—prior to any consideration of health—is endangered by the modern ideology of progress and unlimited growth, a thoughtless process and one that does not seem to tolerate any negative feedback which would invite it to curb or modulate its own actions or drives. More than once, Potter uses the analogy of cancer: uncontrolled human development on Earth depletes the natural substrate where it proliferates. It is like a cancer in which the cells multiply without order or limit at the expense of the host that the cancer eventually kills resulting in the same time its own end (3).

This fatal growth is global demographics associated with the unbridled exploitation of limited and vulnerable natural resources. Here, as on the issue of "two cultures," Potter reacts to a historical context which began to question the modern ideology of progress based on economic growth and the advancement of science and technology. He cites Paul and Anne Ehrlich, Rachel Carson and welcomes the advent of an Office of Technology Assessment (IX; 3), and he places his book under the aegis of Aldo Leopold. The broader historical context is obviously that of the post-war period which has finally highlighted the ambivalence of science and

technology developed under the unequivocal flag of progress (58). It is in this context that Potter speaks of "dangerous knowledge."

But if he means on the one hand that science can be consciously used adversely and diverted in favor of selfish interests, he wants more specifically to say that knowledge is potentially dangerous when in the hands of narrow specialists devoid of bad intentions or even animated by intentions they believe to be good: "Knowledge can become dangerous in the hands of specialists who lack a sufficiently broad background to envisage all of the implications of their work" (69).

The first chapter of Potter's book has a title that defines bioethics on the basis of this anxiety, coupled with a sometimes apocalyptic tendency: "Bioethics, the Science of Survival." In this chapter, bioethics is a *science*; but a science of acting correctly, it is individually and collectively based on science in a more classical sense: one that examines biology and the environment together. A little further, bioethics is defined as *wisdom* in the sense that it brings "knowledge of the use of knowledge," a sort of meta-science of the good use of science and technology: a good use that would ensure "the survival of man and the improvement of quality of life" (1), for present and "future generations" (6). Bioethics is again presented here as a "new ethics," and "*interdisciplinary ethics*." "Interdisciplinary" is defined in a special way so as to include both the sciences and the humanities (4). Moreover, Potter combines these aspects meta-, inter- and multi-: wisdom is "knowledge [of] how to use science and how to balance it in relation to other knowledge" (49).

Defined as a discipline, a science, an ethic, a wisdom, a multidiscipline, bioethics is proving difficult to identify: it is science and more than science. It is a science of science or the *regulation* of science. Here, Potter's interest is carried toward the cybernetic paradigm, another salient aspect of the scientific-cultural context of the time, and mentioned above in reference to the absence of negative feedback in the modern conception of progress. I will come back to this.

And to whom is a bioethics addressed? Scientists of course and, ideally any informed individual, but perhaps first of all to university teachers and politicians (2) because they are the ones who can, through education and regulation, disseminate and enforce the measures recommended by bioethical knowledge, "explain to the public new policies that could provide a 'bridge to the future'" (2) or "make recommendations in the field of public policy" (5). From the outset, bioethics is always bio-politics founded in bio-knowledge. The knowledge it undertakes to develop is a rational knowledge which is of practical significance. The practice of bioethical rationality wants something more and indeed other than the reductive, analytical and positivist rationality that dominates the life sciences. It seeks what Potter claims a "holistic view of biology."

But here we have to be careful and not read this as an invitation to replace scientific methodology, analytical study of the facts and the intersubjective verification of objective causal laws with irrational intuition. What it takes, is more sciences (in the plural) and scientists without blinders to listen to others outside the boundaries of their own strict specializations, scientists capable of seeing the object of their study in the complexity of the relations and interactions which bind the object to its immediate context and the larger contexts that it fits into.

Potter calls himself specifically a "*mechanist*" *and not a* "*vitalist*," *but a* "*pragmatic mechanist*" (11). His invocation of holism is a way to remind the scientists: (a) to not lose sight of the complexity and the total context, in which knowledge is of course never complete or assured in anticipation of its evolution; and (b) not to forget, therefore, the limits of scientific knowledge at a given time, and recognize that we cannot master all the complexity and all the implications of something. His invocation of holism is, in reality, as much moral as epistemological: he invites us to humility, caution, and implores us away from "technological arrogance" (9).

Potter does not encourage a wisdom—vaguely philosophical or religious—which would be a conservative and contemplative holistic vision. He knows that man has always chosen to intervene in nature. Natural evolution itself has led man in a cultural evolution that is interventionist, experimental and which is at the base of the human species' success in the struggle for survival on Earth. It is not about ceasing to intervene; we must only learn to intervene more intelligently (11).

It is in this context that he proposes a conception of man inspired by the cybernetic paradigm that confirms his adherence to causal mechanism, but also to complex "reflexive," open, and prudent systems. The section "Man as an Error-Prone Cybernetic Machine" (12ff) invites us to recognize in the mechanisms of evolution, at all levels, the role of error, randomness, disorder, and the unexpected. These irruptions and interference are necessary, because they are a source of innovations and creations, without which no adaptation or evolution would be conceivable. But they are also risky, inappropriate and often destructive events. This applies both to human intervention in nature and itself. This is why we must develop the knowledge and institutions that allow us to achieve the positive products of this random mechanism and manage its dangers. Potter adheres to Darwinian evolutionism and draws on a number of crucial findings for his remarks. Evolution teaches us that: all species eventually disappear; this is due to the fact that the mechanisms of evolution—environmental selection, random, spontaneous or induced mutation, the struggle for survival, adaptation to the environment etc.—only take account of the short term. The species that adapts best to a given environment certainly dominates but eventually disappears because of its success: its proliferation and expansion come to destroy the environment in which it lives, or its hyper-adaptation to a specified setting takes away any resilience when this environment is suddenly changed. What looks like progress then returns as a progression towards extinction (47).

The human species will not escape this evolutionary fate unless man becomes able to break away from the tyranny of the short term.[5] Man has indeed shown himself capable of developing a biological knowledge that allows him to take

[5]"Man is the sole product of evolution who knows that he has evolved and who is capable of taking steps that might help to insure survival" (Potter 1971, p. 48). In *Global Bioethics* (1988), Potter acknowledges his debt to Dobzhansky on this point: "In 1958 Dobzhansky made three important points that influenced all my subsequent thinking: (1) no biological law can be relied on to insure that our species will continue to prosper, or indeed that it will continue to exist; (2) the human species is the sole product of evolution that knows it has evolved and will continue to evolve."

account of the long term and not only of immediate and/or special interests. Without dwelling on it, Potter notes that materialistic civilization oriented toward unlimited growth and guided by capitalist laissez-faire ideology is only a kind of vulgar transposition of short-sighted evolution. More generally, the economy, politics and R&D that these civilizations deploy do not go in the direction of caution and conscious foresight of the long-term (47ff).

At the conclusion of Chap. 3 Potter turns his attention to Teilhard de Chardin, who he salutes as a man who has a vision of the long term and a concern for the articulation of the sciences and the *humanities*. Potter however distances himself from *eschatological* evolutionism of Teilhard who believes that enlightened by Christian faith, man knows where he is going: "I think, with other contemporary evolutionists, that the ultimate destiny of mankind is unknown and unpredictable, and that no path can be declared assured of success. All we can hope to do is keep the way open and allow several pathways to be followed" (30).

Potter attaches as much importance to cultural evolution as he does to natural evolution, noting that the former should not be modeled on the latter, as is too much the case in our current dominant short-term conceptions of design and unilateral progress:

> The scientific-philosophic concept of progress which places its emphasis on large-range wisdom is the only kind of progress that can lead to survival. It is a concept that places the destiny of mankind in the hands of men and charges them with the responsibility of examining the feedback mechanisms and short-sighted processes of natural selection at biological and cultural levels, and of deciding how to circumvent the natural processes that have led to the fall of every past civilization. (52)

Potter is a rigorous evolutionist who takes seriously Darwinism and its consequences for all living species. But at the same time he considers evolution as it has taken place so far to not have been inevitable. The human species, with its knowledge of Darwinism can intervene in its own evolution. It is up to bioethics to illuminate this intervention. Clarifying the scope of biopolitics in his thought, Potter devotes a whole chapter (Chap. 7) to the idea of a "Council on the Future": "A proposal to cope with the gulf between scientific knowledge and political direction" (75). It is interesting to summarize how he defines this Council:

- Its mission is to "predict the consequences and interactions that can result from applying new knowledge" (77) and "consider the consequences of major research programs" (78);
- It is "above politics and not responsible for political action" (77–78);
- It has no legislative power but should be able to recommend legislation in a published report (78);
- Its composition should be interdisciplinary in the broadest sense; and this "professional group" could be balanced by a "democratic forum" (78).

It is easy to recognize in this outline the well designed anticipation of what will be or should be bioethics committees at the national and international levels.

Although, as a researcher in oncology, Potter is close to the medical world, medicine and medical ethical problems are not at the center of bioethics as he designs it. It is not that he underestimates their importance; rather he wants to break with the specialized and individualistic approach. Thus, for example, all the difficult and controversial issues associated with assisted human reproduction (contraception, abortion, etc.) or end of life (euthanasia, futile medical care) are to be considered in light of the more general problems of demography and economics, technology and limited biological resources (grafts of tissues and organs), without excessive focus on only the individuals at stake. The same shoud be said of the issues, at the time much more speculative than today, concerning the improvement of the human species by biological means (genetic) and cultural (education, habits, life, legal, legislation, information, etc.) that bioethics currently faces. Potter clearly favors the cultural approach—which includes the development of bioethics itself—over experimental or future enterprises of biological improvement (see Chap. 12 "Science and Biological Man"). Eugenics, cloning, and the like are at this stage considered "dangerous knowledge" and certainly not priorities (153ff; 157).

Though a defender of science, Potter does not share the technoscientific futuristic optimism displayed by many scientists proclaiming: "Give us the laboratories and we will give you the future" (151). Neither optimistic nor pessimistic, he advocates an "informed realism that includes humility […]. [A] humility that causes us to listen in order to utilize the thoughts of others" (151). This means that encouraging "pluralistic approaches to social problems" founded on the recognition that no one person can predict the future with certainty will give us a greater chance of being on the right side of the future (150).

These problems must be identified and then we must be careful not to choose the wrong priorities. Potter lists these in order "population, peace, poverty, politics and progress" (151). The complex problem of demographic control, the solution to which culture (education), the economy (the end of poverty) and technology must all work clearly comes out on top. As he says: "Acquiescence to uncontrolled fertility will in my opinion lead to war, pollution, poverty, and pestilence beyond the point of no return. As a moral philosopher I therefore say such acquiescence is immoral" (159).

The penultimate chapter returns to the cybernetic paradigm to make "Biocybernetics, the key to the science of the environment" and therefore an essential foundation of bioethics. It should overcome the hard opposition between ecology and economy, both candidates for driving political conduct in public affairs. Economists believe that the only valid criterion for assessing technology is economic growth and the extent in which it serves the economic interests and institutions of those who decide to use it or not (165; 167). However, evaluation should also be made in terms of species survival. For that, you need control mechanisms including the negative feedback and inhibitors indispensable for control and stability. In a system that knows only positive feedback, the acceleration of the process will become such that the system will eventually explode or implode after exhausting all available resources (169). The biocybernetic approach

should help achieve "an ecosystem running optimally with a level of human population surviving indefinitely" providing a satisfactory life for all and improving quality (180). To this end, we must guide R&D, including "in deciding what proportion of scientists will be free to pursue pure research and how much will be paid to seek solutions to the problems of society" (184).

In the last chapter "Survival as a Goal for Wisdom," Potter calls for a "common system of values for the future" (184): an axiological shared platform on which the various religions and philosophies informed by scientific information and maintaining the same concern about the survival of the human species and the same attention to the quality of life of future generations would agree. He relies on Kant (184ff) and goes on to formulate a "Bioethical Creed" consisting of five core beliefs associated with the five commitments arising from a profession of secular and humanist faith that he also presents as revisable (193–196) and that he does partially revise, in fact, in his later work, *Global Bioethics*.

2.1 "Global Bioethics"

Almost twenty years later, Potter published a second book entitled *Global Bioethics* (1988). This book has an interesting foreword by H. Tristram Engelhardt, who had more than once mentioned Potter in his *Foundations of Bioethics* (1986). In his foreword Engelhardt highlights that bioethics now has a history. The word has encountered extraordinary success, partly due to its vague signification and openness, permitting it to build bridges between realities, problems and issues until then treated as separate and disparate: "Such a word has a fruitful or strategic ambiguity" (Potter 1988, p. VI); "The word 'Bioethics' has rendered a brilliant service by bringing together a wide range of cultural concerns. The term has been deeply heuristic" (IX).

But this success of the word was unrewarding in relation to the original intentions according to which it had been created. The medical world had seized upon it to form a sort of updated label for medical ethics that primarily served to express a distance from medicine and traditional deontological medical ethics. Potter was well aware of this and he designated Georgetown University and its Center for Bioethics, put in place from the beginning of the seventies, as being primarily responsible for applying the term bioethics to problems only considered in narrowly medical terms. Engelhardt is close to this group which includes André Hellegers, LeRoy Walters, and Warren Reich, and his influence grew steadily, especially through the first Encyclopedia of Bioethics, which appeared in 1978.

Despite these developments, Potter lays out, in this second book, a very strong continuity with his initial approach which he sets about to bring back, deepen and justify with new arguments in *Global Bioethics*. Starting with the ecological and ecoethical dimensions of bioethics, much more than in his 1971 book, Potter emphasizes what he owes to Aldo Leopold: "Unquestionably the first bioethicist,"

as he writes in his Preface (Potter 1988, p. XIII).[6] We should not underestimate that between the beginning of the seventies and the end of the next decade, environmental ethics had also vigorously developed and become independent, such that to preserve a distinct identity, bioethics was tempted to move closer to medical ethics.

Potter did not ignore the importance of medical issues in his first book. He wanted to place them in a more complete light, taking into account their complexity. He returned to the subject in 1988 with more space and attention: he devotes a whole chapter to "Dilemmas in Medical Bioethics." But he also criticizes traditional medical ethics as not being distinct from what he denounces in the ordinary approach to the problems raised by R&D within the context of economic, political and common morals: the short term vision, a vision limited to interests and the individual rights or immediate needs and a denial of the wider responsibilities (1; 74; 95; passim). And, I quote: "We can no longer consider medical options without considering the ecological science and the broader problems of society on a global scale" (2).

"Global bioethics" is an expression, all in all, *redundant*, because the first definition of bioethics places at its center this "holistic" requirement for a comprehensive global approach. But redundancy has become necessary because the initial conception of bioethics has been bypassed somehow by its identification with a revisited medical ethics which has not itself expanded and been made more complex by the consideration of global society and, especially, of the global natural environment, i.e. taking into account global demographics and questions of lifestyle/consumption. Potter now speaks of "global bioethics" because it is clear that the two major components of bioethics—the medical and ecological—tend more to depart from one another than to converge: "Much has been written about environmental ethics without mentioning the need for controlled fertility [which raises medical questions and medical ethics] while much has been written about the rights of individuals without discussing the need to preserve a healthy ecosystem" (75). "Global bioethics" is "a unification of medical bioethics and ecological bioethics" (75; 76). One of the characteristics of the Potter's approach is his desire for balance: "It's all a matter of balancing the options!" he notes (75). This concern seems to me, as a philosopher, although very important, not easy to support, because while we want to speak in a balanced way, we might neutralize the message or at least make it unsuitable for direct action. This risk is present unless we indicate, as Potter tries to do, in what sense there in an imbalance; but then one enters a more or less polemical discourse and there is a risk of being identified and reduced to the trend that one strives to defend because it is considered under-represented.

It should not surprise us to find at the center of Potter's concerns the question of the survival of the human species related to the uncontrolled demography: a problem he considers to be seriously underestimated, especially in the medical world (see, Potter 1988, Chaps. 3 "Human Survival" and 7 "The Control of Human

[6]Potter gives his book the sub-title *Building on the Leopold Legacy*, and dedicates the first chapter to Leopold. See Leopold (1949).

Fertility"). In addition to these fundamental concerns, there are also some interesting new themes in *Global Bioethics*. For example, linking the worries about population and demography to feminism. Potter argues that women are particularly sensitive to all matters relating to human reproduction (free choice, birth control) as well as those relating to the preservation of a healthy environment: they understand the meaning of "care" (86; 88). This sensitivity compensates for the primacy of the "macho morality" of "male domination and male independence" that is "in part the source of the belief that it is possible to find a technical solution to any technical disaster" (90).

We must be attentive not to read into this any technophobia or sciencephobia; rather the primary concern remains for the sense of balance: medicine must be informed about the societal global consequences of its technoscientific progress and drive to push always further. The cult of medical performance and the "tyranny of survival" of the individual lead to serious imbalances. Here, as elsewhere, Potter dreams of harmonious complementarity: "global bioethics must be based on a combination of rights and responsibilities in which the male and female are not seen as mutually exclusive dimensions of a bipolar continuum" (90). Potter is however not a dreamer: Much more than the first book, *Global Bioethics* takes on what we today call "biopolitics," analyzing and commenting on several legal trends, legislation and policies from the 1980s in the USA.[7]

Potter retains a philosophical bent, or rather a leaning towards a kind of practical wisdom, which is not exactly the same thing. He does not know philosophy well and only mentions it briefly so as to underline its limits ("The Limits of Philosophy", p. 80ff). In fact, Potter is and remains above all a scientist who does not conceive of ethics (and philosophy in general) as other than essentially fact-based.[8] This is also why he thinks it possible to develop a quasi "scientific" bioethics, a universal bioethics at least as far as science is universal. In this, he remains thoroughly modern. This is also an aspect that separates Potter from bioethics as it developed under the leadership of Georgetown whose major proponents are often philosophers and theologians. Engelhardt is one of these, but he offers the uniqueness of being a philosopher, physician and theologian.

So, what does Potter tell us about Engelhardt? Like Engelhardt, he sees Bioethics as secular: "a secular program," not to be confused however with "secular humanism," because this current of thought accords too dominant a place to humans within the biosphere, as if man was substituted for God in Judeo-Christianity. Bioethics cannot be based on religious dogma and the separation of Church and State is fundamental (Potter 1988, p. 146ff). Along with Engelhardt, Potter advocates tolerance. But, in addition, Potter is confident of the fact that members of the various religions could agree on key bioethical goals of survival and quality of life (152ff). Engelhardt does not share this belief.

[7]For example, the 1985 "Wisconsin Legislation" (Potter 1988, p. 145).

[8]From the first lines of his introduction he constantly reminds us that ethical values cannot be separated from biological fact (Potter 1988, pp. 1, 59, 75).

According to Potter, Engelhardt also insists much too exclusively on the principle of autonomy at the basis of medical ethics and in so doing only considers individuals and their interpersonal relationships.[9] What does that mean? It is necessary to go beyond the exclusively procedural and individualistic character of Engelhardt's bioethics, which allows for the peaceful management of religious and philosophical diversity, but which does not take account of the biological and ecological realities. Moving beyond diversity is possible from the point of view of global bioethics because it takes into account the scientifically established realities (the facts), and it still assumes a fundamental convergent interest of all when it comes to the survival of the species and the improvement of the quality of that survival. This is why the "global bioethics" approach must lead to conclusions and substantial decisions to which everyone can refer. This is what Potter thinks, believes and wants, and it is a result of his modern universalist vision, which includes the values of justice, solidarity, equality.

Unlike Engelhardt whose individualistic and communitarian positions, but also ethical and epistemological ones, are of a more postmodern trend, Potter has a sense of a global justice, with global (world) meaning (154): he seeks a balance between the desire of each person (rights and individual responsibilities) and concern for all. He wants to empower individuals in an accountable way not only vis-à-vis themselves and, where appropriate, of their community, but to all in general. And it is in this perspective that the problems of survival of the species and natural resources are essential. Engelhardt's bioethics focused on medical issues between individuals and is not concerned by these issues: "Clearly limited to the roles of health care givers and receivers, [Engelhardt's] book does not mention problems of overpopulation or changes in the environment. Nor does it embrace the concept of positive health for populations local or world-wide as a goal for medical bioethics" (156).

2.2 A Last Call

I had the honor and the pleasure to attend (via video link) the lecture where Potter spoke at the opening of the Global Congress of Bioethics at Gijón in June 2000. He died the following year. It was therefore, one of the final reflections on bioethics on the part of its initiator.[10] I was struck by a number of things: First, there was a very strong continuity in his thought, which in the meantime had found new "allies."[11]

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[9]"Engelhardt's commendable vision of a peaceful, secular, pluralist society needs to be extended beyond the issues of health care for individuals, beyond the conflicting value differences of traditional religions, and into the biological realities that shaped 'The Land Ethic'." (Potter 1988, p. 121).

[10]Together with "Moving the Culture Toward More Vivid Utopias with Survival as the Goal" (Potter 2001).

[11]His principle references were to Lester Brown and his Worldwatch institute with its annual publication of the "State of the World" report and its call for a "new ethics."

Second, an insistence that "globalism" continues to concern firstly the taking into account of the natural environment for the survival and sustainable development of the human species, but references to the global society and the requirements of social justice are at least as important. In a 2001 article (Potter 2001) he calls for a "realistic balance between anthropocentrism and biocentrism" after having specified: "acceptable survival must be defined as survival that on the one hand is compatible with the continued diversity and symbiotic relations of full-blown species diversity and, on the other, compatible with diverse ethnic populations living in health and dignity in 'civil societies'." This is the vision of his utopia. Third, a continued emphasis on the fact that these problems cannot be resolved by traditional ethics and that bioethics in its broad sense is essential. The problem with traditional ethics could be coarsely summed up by saying that they do not concern themselves adequately with the future, other than in the short term, they are centered on the individual, they ignore the teachings of science and in particular biology. Finally, these last reflections from the founder of the bioethics were marked by a notable sense of urgency: we are living in a state of emergency, "for one hundred years to come, we need a bioethics *policy* with a sense of urgency."

3 A Personal Journey

I also belong to the first generation of "bioethics," in fact, to the generation of those who, coming from different disciplinary backgrounds, have discovered or invented and explored and established this new (inter-) disciplinary field. I belong to that generation of pioneers who have met *independently and following paths often very personal, the same family of questions.* I'm not saying the same questions, but questions that have a family air to them because they have an ethical dimension and are associated with the development of science and technology. My journey towards and in bioethics differs from that of Potter, whose name and existence I was totally ignorant of when these problems first started to demand my attention. We must go back in the mid-1970s when I was working on my Ph.D. thesis (1973–1976) as a philologist and a philosopher. I was at the time much more interested by the philosophy of language and philosophy of the sciences than in moral and political philosophy. But this interest was very critical of the dominant philosophy of the 1960s and 1970s whether it was French, German, or Anglo-Saxon. It is in this framework that I was led to create a new word that has, much like the term "bioethics", subsequently travelled at the discretion of those who used it: "techno (-) science." I have to speak about the introduction of this neologism to illuminate my path to bioethics.

3.1 Techno (-) Science and (Bio) Ethics

3.1.1 The Philosophical Context: Response to an Outdated Image of Science Conveyed by a Resigned Philosophy

I introduced the term "techno-science" giving it a range that is both positive and critical. Positively, it seemed more appropriate for describing contemporary science. Negatively, it allowed me to criticize the traditional concept of science as primarily theoretical and discursive, aiming at a symbolic representation of reality. In addition, the concept of techno-science offered a base to denounce the dominant currents of mid-twentieth century philosophy, a philosophy enclosed in its problems of language, unable to face the extra linguistic reality with all of the new questions raised by techno-science.

The first appearance of "techno-science" was in my doctoral thesis from the Université Libre de Bruxelles, *Essay on the Causes, Forms and Limitations of Inflation of Language in Contemporary Philosophy* (Hottois 1976). The thesis was published in book form in 1979 as *Inflation of Language in Contemporary Philosophy* (Hottois 1979).[12] The first sentence in which the word appears immediately indicates the scope and radical criticism of philosophy: "The hypothesis: What contemporary philosophy has excluded is techno-science, the cosmic confrontation, deprived of real illumination [*lumière*], that techno-science opens up, the universe with its transhuman possibilities. Is it a result of the increasingly extensive and complex stranglehold of techno-science on the real that philosophy has lost its ontological reference?" (Hottois 1979, p. 52).[13]

This original association between "techno-science" and "trans-human" is currently of great interest as the discourse around trans/posthumanism is increasingly raising attention and controversy. It is in the third part of the thesis (and the book), entitled "The Cosmic Wall" that the concept of techno-science becomes quite central. In it, a very critical view of philosophy is developed, with however a partial exception: Martin Heidegger, who had seen the importance of technology and what it implies in terms of putting in question—or even denying—human being, language, nature, history, the world, and even Being itself. But Heidegger strives to retrieve, to assimilate the radicality and otherness of technoscience in claiming that what matters to the thinker is not actual, physical techniques, but the essence or better, the "being" of technology, which he calls the "*Gestell*" (framing), meaning that in its essence technology frames or structures all of human existence, rather than being a simple

[12]The thesis is available from the ULB library and as there are some differences between it and the published text, most significantly in the notes, I will make reference to both here.

[13]The translation has altered significantly the form of the original passage: "*L'hypothèse: le forclos* (*de la philosophie contemporaine*) *est la techno-science, l'affrontement cosmique dépourvu d'authentique lumière qui s'y pratique, le cosmos aux possibles transhumains. Est-ce par suite de la mainmise de plus en plus étendue et complexe de la techno-science sur le réel, que la philosophie a perdu la référence ontologique*?".

instrumental means to an end.[14] However, Heidegger argues that Being unfolds in language, in words, and not in objects and processes. To understand what happened with the techno-sciences, one doesn't need to be an engineer or cyberneticist or geneticist, but a philologist and hermeneutician: query the word "technique" and its origin, as well as the words to which it is akin, and seek their original and authentic meaning in the texts of tradition dating back to the Presocratics. Despite his being aware of the importance and radicality of technology, Heidegger's solution remains part of the nebula which I later called "linguisticist idealism."

3.1.2 Characterizations of Techno-science and Its Ethically Problematic Scope

The concept of techno-science primarily emphasizes four aspects:

1. The crucial role of technology and more widely procedure (operativity) in modern and contemporary science;
2. The basic operative (and non-theoretical) relation of humankind to the cosmos itself: a relation of transformation, production, manipulation;
3. The dimension of the future as open and opaque;
4. Failure of a simply anthropological concept of techno-science: cosmic operativity (creativity), in which techno-science inscribes itself and intervenes, extends itself indefinitely before and beyond *anthropos*, to the past and to the future, and through cosmic space.

Let us develop this description somewhat along the following themes:

Techno-science and the End of Man

Techno-science is closely associated with the question of the end of man. Not in the sense of finality, but meaning the disappearance by *mutation or annihilation.* Religions and historical philosophies—from Christianity to Marxism—project the future in terms of finality, a sense of accomplishment: the human essence, present since origin but imperfect (fallen or alienated), will be carried or fulfilled out at the end of time or history. Techno-science refers to the disappearance, pure and simple, of the physical human, following some technical or cosmic cataclysm: a physical annihilation without descendants. This idea haunts the imagination of the future, but it seems to especially betray a *lack* of imagination. The idea of the *mutation* evokes not a pure and simple disappearance, but a rupture (sudden or gradual), a change of specific scope, that alters the "essence" of the human. "Techno-science" thus refers to these representations and actions in ways that raise both theoretical and practical

[14]In English *Gestell* is normally translated as "framing." In French the translations of this term in the Heideggerian context are more varied: "*arraisonnement*" (framing), "*dispositif*" (device), "structure," and "machine" are among the most common.

questions concerning the end (but not the finality) of the human species. A purely anthropological concept of techno-science misses this *transanthropologic scope.*

Techno-science and the Future

To characterize techno-science by reference to the future is a no-brainer. But my goal in emphasizing the distant and even very distant future in relation with techno-science was to evoke the strangeness and potential otherness, using the analogy of turning the temporal vector upside down. When compared to the biological, cultural and technical aspects of our present form of human life, the strangeness of the distant future might be as deep and as amazing as the strangeness of forms of terrestrial life from the first or second eras. Nothing could have allowed the inference, prediction or even imagination of our present civilization from the very distant past of paleontological eras. It is therefore not prohibited to imagine for the distant future a strangeness of the same weight if not the same content or same form.

The influence of the Darwinian evolutionary thinking on techno-science and how it conceives temporality is crucial.[15] The distant future must appear as radically *open and opaque*. We must avoid reducing these qualities to one or another prophetic projection and, in particular, to a socio-political utopianism. This kind of projection may have some value for the near future provided that it remains critical and does not aim to lock up evolution in the deadlock of a final utopia. The question about the distant future of man must remain unanswered—and especially avoid recourse to a fixed single answer—not only is this a philosophical question, it is a question that the philosopher has a responsibility to keep open. Keeping this question open and without an unequivocal answer is not without consequences for the evaluation of more concrete issues that arise today, including about techno-scientific R&D. I never forget this opening of the future when practicing and thinking in the field of bioethics.

Techno-science and Cosmic Prospecting

What I called "cosmic prospecting" is not reducible to the exploration of space, even if I do maintain that cosmic space and not terrestrial nature is, *par excellence*, the challenge of the future raised by techno-science. Indeed, in space, away from the support of the terrestrial biosphere, man is totally dependent on techno-science. The spaceship represents an absolute or nearly (insofar as it remains connected to the Earth by radio) absolute micro-technocosme. In the radical break with terrestrial nature and the cultivated historicity of a meaningful world, cosmic space is rough and endlessly opening without direction or horizon, it is delivered up to anthropotechnic adventure. It may involve the technical redesign of the humans that will

[15]Gérard Klein notes in the preface to *Histoires de Mutants*: "The Darwinian revolution introduces an even more vertiginous decentering than its precedent (the Copernican revolution) because it takes a lot of determination to reveal to a whole species the table of its origins and its probable disappearance and replacement in the world, establishing this upheaval in the natural order of things and not in the context of an eschatological global catastrophe." (Klein 1974).

undertake it: hence the idea of the cyborg that I mentioned as a (non-primarily organic) mutational possibility.

When the philosopher asserts that the (Kantian) question "what is a human being?" should be asked without end, indefinitely, this is not only to be understood in the hermeneutical sense of an explorative speculative or narrative discourse, that is in the sense of a merely symbolic practice. The question is also to be understood in the sense of techno-scientific experimentation itself. It is the exploration through operative procedures that are biophysically creative, transformative and inventive. Speech and narrative can accompany and recap, but not anticipate (or just barely) this process, and even less, substitute for it. In short, the exploration of what it is to be a human being, now and in the future, must be undertaken as more than a hermeneutic activity. It is also the activity of techno-science itself.

Futurology expresses however a vital responsibility for the future, but it provides only a "very pale light that accompanies the cosmic exploration" (Hottois 1979, p. 470). Cosmic-prospecting is technoscience running on all fronts. It is productive of the future, while at the same time all eschatology fades in its wake. Cosmic-prospecting, beyond the adventure of space travel, is the attempt at everything possible with the awareness that no particular standpoint, no discourse and no theory will allow for an account of the experience it produces. It is the questioning of man pursued operatively as well as symbolically.

I noted that the first occurrence of "techno-science" is associated with "transhuman" (17; Hottois 1976, pp. 52, 350); I also used the term "post-human" more or less synonymously with "*abhuman*" in this context because it functioned to distance these terms from any kind of mythology of the Superman. I remember having long hesitated between these three words (trans-, post-, abhuman), none seemed quite satisfactory to me. Alluding to the unqualifiable, these terms range from a lack of meaning and reference to over-determination and an arbitrary and naive polysemy. They are however at the heart of my original introduction of "techno-science". Techno-science contributes to the receding, and perhaps eventual removal of "limit-situations" (see Karl Jaspers concept of "*Grenzsituation*") specific to human finitude, declared insurmountable by most philosophies and religions, such as being born, suffering, vulnerability, aging, culpability, death…. I however expressed a reservation or a warning against this optimism, such a future is not expected in a simple and unequivocal manner: "Because effectively challenging limit-situations does not lead to any redemptive and accomplished superhumanity. It opens on the ab-human, the post-human" (Hottois 1976, p. 346, 1979, p. 457). "Attentive to the cosmic exploration, the philosopher," I wrote, "shows the inhuman or abhuman forces that work the human up to the limits of our imagination" (Hottois 1976, p. 362).

Techno-science and Ethics

Up to this point, in my account of the arguments put forth in *Inflation of Language in Contemporary Philosophy* you will have noted, there has been absolutely no question of ethics. It is not until the last section of the thesis and the book that I begin to express my hesitation and perplexity as to how to develop and formulate the new ethical issues invoked by techno-science and speculative imagination. This

last section is entitled "The—ethical?—fundamental question." The question mark is quite significant.

The reason for this reluctance is that the categories of ethics appear as "human, too human." Moral sensitivity and conscience belong to the form of human life. Values and standards are historical and cultural. How could one seriously undertake to assess the future of the human species, make choices and decide about its future deliberate developments while using categories that were all internal to human life?

Being itself at stake, judge and party, can ethics do more than protect and encourage the conservation of the natural-cultural human against any deep and adventurous temptation for radical change without immediately rejecting such possibilities as immoral? Is ethics not intrinsically inclined to place "the ultimate dignity of man" in "the assumption of its nature (especially of the parameters of human finitude)" against "the audacity and the risk of the negation of this nature"? (Hottois 1976, p. 368).

I concluded, that however unsatisfactory and not devoid of risk themselves, the ethical categories appear all the same as "less inadequate" (363) to seriously addressing the issues from a philosophical point of view than the alternative of eschewing them. At the time, ethical categories had in fact begun to receive specific and concrete formulations, in particular in the fields of biomedicine and biotechnology, specifically in the form of the then-nascent bioethics in institutional form (commissions, committees of medical ethics).

The position of the French writer, Michel Butor, admirably reflects my own thinking here which I phrased as such: "I would reject the term of humanist if we saw in this idea an absolute validation of a human concept defined once and for all, in opposition to what is not human. […] any idea of man which does not push its boundaries towards the animal or machine, or more generally the abhuman and the superhuman necessarily leads to the oppression of man by himself" (368).

3.2 Evolution

The evolution of my approach to bioethics during the 1980s was decisive. During the first half of this decade, I opened up my thinking even more to ethics, including the more political aspects, but it was not centered on bioethics. What was important to me was a philosophical reflection on technology and techno-sciences, and particularly on the very problematic relation that philosophy and its history still had in the twentieth century (and continues to have) with technology, an attitude often best described as marked by ignorance or contempt (technophobia or techno-indifference). In several works from the 1980s, *Le Signe et la technique* (1984) and *Pour une éthique dans un univers technicien* (1984), I attempted to develop a general philosophy of technology with special emphasis on ethical issues. The latter book—which is a sort of an anthology of commentary and critique of important texts for thinking on technology—is also significant for somewhat broader reasons. Some texts contained in the volume do address bioethical issues, but neither biotechnology or biomedicine

occupies a central place. In 1990 nearly the entire text of this small volume was integrated into a larger book published under the title *Le paradigme bioéthique* in French and Spanish at the same time (later also in Portuguese and Italian). What happened between 1984 and 1990 leading to the second publication was primarily a policy event. In 1986, the Belgian Ministry of Health organized the first big national multidisciplinary and pluralistic colloquium in Belgium on "Bioethics in the 1990s" bringing together all Belgian universities. At the time, I was one of the few professors or researchers at the ULB (Université Libre de Bruxelles) who addressed ethical questions associated with techno-scientific R&D. I was therefore asked to represent my University within this framework of bioethics debate that began to become institutionalized and also express policy issues.

It was then, during 1986–1987, that I founded Centre for Interdisciplinary Research in Bioethics (CRIB) with the help of population geneticist Charles Susanne, and I began to commit myself more and more to the field of bioethics, which up to that point I had only touched upon. Previously having been only a particular chapter within a much wider study of the philosophy of technology and techno-sciences or techno-scientific R&D, bioethics became increasingly the center of my research interests. The most productive decade of my work in bioethics extends from the beginning of the 1990s to the first years of the 21st century when I was membre of the European Group of Ethics for Science and New Technologies (EU) and the Comité Consultatif de Bioéthique de Belgique. I will mention here the most significant steps in this development.

In 1993 the first French "bioethics dictionary" with an encyclopedic aim was published: *Les mots de la bioéthique*, which I co-edited. This edition mainly brought together collaborators from CRIB and a medical ethics group at Université Laval in Quebec. In 1999, I published a collection of essays, *Essais de philosophie bioéthique et biopolitique*. The title perfectly illustrates how the focus of my interest had shifted to issues that I had first not contemplated (biopolitics) without abandoning the philosophical issues surrounding "bioethics." This work represented what might best be called a "bioethico-political" trend—what I considered to be a free, secular, and non religious approach. I also always strongly maintained a lively philosophical concern for compliance with the pluralistic and multidisciplinary methodology of bioethical discussion.

This concern expresses itself through the design and direction of the *Nouvelle Encyclopédie de Bioéthique* (Hottois and Missa 2001) and the short book *Qu'est-ce que la bioéthique*? (Hottois 2004a, b). These two works best illustrate my way of dealing with bioethics. In parallel with this ideologically and philosophically "committed" bioethical activity, I continued my independent and comprehensive philosophical reflection on technology and the techno-sciences.[16] These last few years, I started to deal in depth with the issue of the imaginary of science and

[16]Examples of this being *Simondon et la philosophie de la 'culture technique'* (1993), *Philosophies des sciences, philosophies des techniques* (2004a, b), *La science : entre valeurs modernes et postmodernité* (Hottois 2005), and *Dignité et diversité des hommes* (Hottois 2009).

technology in the twentieth century. Having looked at the development of my own approach to bioethics as well as some of the institutional developments in the French-speaking world, let us now return to the question of bioethics itself.

4 Two Bioethical Approaches

Confronting Van Rensselaer Potter's point of view with my own allows us to illuminate certain salient aspects of bioethics. We are both sensitive to the issue of the *two cultures*, although I became aware of it later and in a progressive manner. But we come from *extreme opposites*. Potter's background is as a specialized scientist: he marks off the problems, determines their priority and focuses on the solution. He never doubts that science is unitary, universal and objective. He sees technology as applied science. My background is as a philosophical generalist: the key issues are the ultimate questions, those that remain without a definitive answer. I see science as techno-science, I don't fundamentally distinguish between science and technology and I wonder about the reciprocal impact of techno-science on the ultimate questions and the latter on the former.

This does not prevent us from meeting up on a pragmatic field: when problems are scientifically or objectively established, it is necessary to resolve technical or practical measures. But Potter seems to consider these solvable problems with the conviction that everyone should be able to agree on their solution. His pragmatism is of a scientific and ecumenist orientation. I have sometimes described my own pragmatism as "speculative": I do not want to forget the unanswered questions that lurk in, above, or below issues regarded as solvable. For this reason, I am less convinced than Potter of the possibility that we might all come to agreement at the end of a genuinely pluralist discussion, during which fundamentalist voices for example, are also expressed. As bioethical problems are linked to or even grounded in often-intractable philosophical ones, I, unlike Potter, often see no definitive or consensual answer.

If there is a topic on which we share common ground, it is the importance of the future, beyond the immediate future. But Potter actually sees the future in the medium term, a future extrapolated from the noticeable trends of the present in order to anticipate the problems and risks, and to resolve them. His relation to the future is practical and pragmatic. My first interest in the future is much more speculative: it is the long-term future and even the very long-term, unanticipable, opaque, and open future that grips me philosophically. However, neither Potter nor I have eschatological beliefs concerning the end of time or history and we are not counting on any natural or divine providence.

We are both evolutionary in the sense in which we take seriously the Darwinian revolution. But above all, Potter sees a risk of extinction of the human species by an imbalance and exhaustion of its natural environment. He wants to use science and technology to avert this risk. The danger and the priority that dwarf all other considerations are there: humankind can and should intervene in evolution to escape even its natural fate of extinction. To this end, for the preservation of the

human species, the number one priority is the preservation of nature. Beyond this desire for mere survival, Potter also seeks an improvement of the living conditions of humans (or even living in general). He sometimes speaks of an "optimal environment," a kind of utopia in a reconciled peaceful world, evolving perhaps, but without failures, conflicts, or serious imbalances. The danger is the destructive change of natural balances. My vision of evolution is not primarily focused on problems of conservation and preservation of nature. It further takes into account the possibilities of human self-transformation. Its emphasis is more on creativity, diversity, and growth associated with spontaneous evolutionary processes or human-induced. Techno-scientific intervention into evolutionary processes should not only aim to conserve or to preserve, but also to invent, create, innovate, whether it is nature or the human species itself. I am wary of any form of utopianism which tends to focus on the unique and universal and is considered itself the only good way forward, but which may lead to an evolutionary impasse.

If Potter is haunted by the pure and simple disappearance of the human species, which for him lurks in the foreseeable future, I am fascinated by the possible self-transformation(s) of the human species. And I do not exclude the hypothesis that in the very long term, these are better guarantees for the future of man and his offspring than approaches to preservation and conservation. I will therefore leave wide open this field of research and invention, which is absolutely not on the agenda according to Potter.

Potter identifies nature, and I want to add, the original and final universe of humankind, with Earth's natural environment. It is obviously limited in energy and other resources. Potter absolutely does not take into consideration what I call "the great nature," the cosmos, whose resources are potentially endless. He cannot imagine that man, or at least a fraction of the human species, may one day completely split from this native terrestrial nature, migrate through space and live, transformed, in extraterrestrial natures or in technocosms: entirely artificial environments.

I do not share the feeling of an almost apocalyptic urgency that mobilizes Potter. I do not deny the very serious problems, including the environment, that we face, but I think there are various ways to treat them, i.e. various socio-political and technoscientific responses. I still have more confidence in technoscientific research, technological innovations and pragmatic approaches, than in a certainly seductive wisdom that remains vague and has little effect despite its scientific references. In the range of what he calls global bioethics, Potter is more sensitive to the problems of environmental ethics. Personally, I discussed and practiced bioethics more through the issues associated with biomedical ethics.

But both of us have evolved taking still more seriously issues of "society," what could also be called "biopolitics" and "biolaw": bioethical issues approached in their actual context of formulation and discussion that is social, economic, political and legal. Within this framework, Potter straightaway welcomes a more moderate principle of autonomy which underlines risk of excesses and abuse, as well as possible negative consequences for the environment and for social equality, solidarity and justice. Personally, I have always strongly defended this principle both on the individual and community level as well that of R&D. The freedom of

scientific research cannot be exclusively or excessively dependent on solving problems of society and companies (defined by the policy or/and the economy).

We agree that bioethics is multidisciplinary, pluralistic and secular. But Potter is more optimistic and positive than me with regard to the possibilities and necessities of consensus. This is because he perceives bioethics primarily as a response to *one* pressing problem or at least a set of closely related urgent problems, which he sees based on a modern vision of science that should enable overcoming differences and divergences especially in emergency situations. Bioethics will be able to solve the environmental and societal problems resulting from individual and collective human activity associated with technological development. He sees bioethics as a new *discipline* or inter-discipline, a new ethic and at the same time a new *science*, a regulatory "scientific" wisdom of science. He continues to rely on this vision while becoming more and more sensitive to the political and economic aspects, the multiplicity of the forces at play that tend to make the bioethics a nebula of ethical-political pressure, pretty far from an actual science. I myself have evolved in my vision of bioethics. But it remains for me, above all, a field of new or renewed questions raised by R&D in the fields of biotechnology and biomedicine within a multicultural civilization in the difficult process of globalization. Questions to which there are, most often, several responses and interim responses; others for which there is no answer.

From a philosophical point of view, the elaboration of these issues demands a respectful pluralism that also respects the multidisciplinary methodology of the techno-sciences with their objective operativity, as well as multiculturalism. I care for the preservation of diversity and for the non-confrontational management of this diversity allowing change, creation and evolution. I see agreements and consensus sometimes as essential and sometimes as dangerous. In fact, Potter thinks of bioethics in terms of multidisciplinarity more than pluralism, without clearly seeing that these notions are quite different. Potter is not hostile to pluralism, but his embrace of modern science does not allow him to see all the difficulties of pluralism. I am much more aware of this question of pluralism linked to the issues of postmodernity and technoscience.

Potter often compared bioethics to *wisdom* and this term connotes the virtues of humility, reserve, temperance, etc. Is it not wisdom that philosophy aims for? But it is precisely the word "philosophy" itself that reminds us that we can never reach wisdom. Wisdom is reserved for the gods. The invocation of wisdom by those who claim to possess it inspires mistrust in me, because wisdom usually goes with a paternalistic authority that combines power, truth and virtue (the good), an authority that in all good conscience presents itself as unquestionable. So I have the desire to preserve the spirit of adventure, of contradiction, of transgression, and of new frontiers to explore and conquer. It is not without risk, but the absence of any risk is not life, it is death.

In conclusion, I would say that between the design of Potter's bioethics (at least as I have understood him) and my own there are many similarities, but there are also profound differences. In a very general way, I see Potter as closer than me to the modern ideology of science and progress. Progress, following Potter, only becomes ambivalent and very perilous because of man's ignorance and lack of consciousness. I am more open in my approach to what is called postmodernism—while perceiving

its excesses and by-products—and its suspicion towards the "grand narratives" of science and progress. Despite this, I retain a certain optimism. In the long run, I think more in terms of evolutions and impasses in the plural than in terms of universal and unequivocal progress. The future is full of adventures that will not go without risk. I worry that an excess of caution stifles the spirit of experimentation, research and freedom. Making references among the great names of bioethics, it seems to me that Potter is often closer to Hans Jonas than to Engelhardt.[17] However, Potter does not partake of reservations about science and modern democracy. As for me, I'm probably closer to Engelhardt than to Jonas, even though I don't agree with all Engelhardt's communitarian, neo-liberal or even libertarian choices. What I can say for certain is that in bioethics all the complexities of our era, at once modern, postmodern and pre-modern, are expressed and interact. The practice of bioethics, whatever it is, must never lose the vision of this complexity in motion, which is its wealth as much as its difficulty. Bioethics should not become a narrow specialization, simplifying problems. Let us remember that Potter had invented the word in reaction against specialization, reduction, segregation, biased simplification of issues and responses. Let the current and future (bio)ethicists not forget!

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[17]Hans Jonas's contribution to bioethics is explored in the next chapter—the editor.

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