The Digirati: A Critique of the Futures Industry

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1. Under the Spell of Tomorrow

> These days we are filled with nostalgia for the future - James W. Carey, 1992

The Futures Industry

Over the past decades, the future has become central to our thinking about politics and society. It is difficult nowadays to read a newspaper, a weekly, or an Internet magazine, or to turn on our radio or television set, without being bombarded with information about tomorrow's society, the world's long-term development, or the far-reaching technological innovations that will radically change our lives. There is no end to our fascination with such topics, it seems – their appeal has grown as infinite as the future itself. Yet in most cases we hardly know what to make of the plots and prophecies futurologists and trend watchers dish up. It is as if we have contracted out the future to a separate branch of business, the "futures industry," a venture that supplies us with what we increasingly ask for: projections, predictions, trend reports, concrete scenarios, as well as holistic visions of the future. Clearly, the future has turned into a popular commodity.

A sustained uneasiness, if not outright discontent, with the quality of this product informs this study. They are so much alike, all those rosy narratives about the coming of a new economy and the downing of a digital way of life. It struck me that all of them are rife with utopian projections, in the manner of: "In twenty years children who use the Internet will no longer know what nationalism is," or: "In the next century we will have access to unlimited travel without us spoiling the environment." Predictions of this kind merely aim to attract our attention by challenging our sense of the world and its continuity, I felt, but then again, it was hard to deny that frequently highly respected scholars were the ones who articulated them. The expectation about the effect of the Internet, for instance, originated with Nicolas Negroponte, a professor at the prestigious Massachusetts Institute of Technology. After I began to study the history of the future, I soon discovered what I already suspected: from the Renaissance on, there has been talk about the "glorious days" the future has in store for us. Since about a century and a half, new technologies in particular are seen to harbor the promise of leveling the boundaries between

peoples, or they are assumed to lead us into a blissful future otherwise. Especially the reach and persistence of the belief in the blessings of technology caught me by surprise, though. The train, the steamship, the telegraph, the airplane, radio, television – all these innovations were invariably ascribed some sort of progressive social force at one point. Similarly, the vision of transportation systems that have no harmful environmental effects happens to be part of a longstanding tradition. The dream of ready available and inexhaustible energy sources has been with us for some generations now. Electricity, people thought at the start of the twentieth century, would not just enable a prosperous and free life for the social elite but for everyone, an expectation that even grew stronger with the arrival of nuclear energy. Not only would nuclear fusion provide us with a clean and cheap source of energy, it would offer us a future that was free of war and disease. Significantly, a 1959 Walt Disney movie was titled *Our Friend the Atom*.

My notion of "futures industry" does not refer to everyone who is professionally engaged in making projections about the future. The many planning reports that are commissioned and produced at all administrative levels certainly reflect one instance of the enhanced concern for the future in modern societies, but my uneasiness, or even irritation, is urged by a specific branch that gained ground in the 1990s and that involves a group of various (post)modern technocrats – such as cyber gurus, digirati (prophets of digital life), management consultants, and transhumanists – who specialize in selling bright futures. Because their customers tend to be solely geared toward the future, these techno-salesmen entirely neglect the past as a source of knowledge. Time and again, they frame the future in terms of yet another exciting prediction, regardless of the fact that reality caught up with their earlier prophecies and proved them to be misguided. Why bother, some may feel. After all, these sellers of rosy futures have no stake in being accurate; their predictions are only meant to trigger certain forms of consumer activity – to prompt people to purchase products and stocks or invest in new ideas and companies. "Optimism sells," Disney's private motto was, and this still applies: a product or idea sells best by directly associating it with a desirable future or dream world.

It would be too easy, however, to cast the futures industry in a negative light only and suggest its sole aim is to deceive people. After all, engineers and other product developers tend to have a strong belief in their own optimism, and fortunately so because it drives them to do great things. Moreover, nourishing expectations is part of the art of innovation. Whoever is seeking financial support for a new project or product, for instance, has to make all kinds of promises

about its projected quality and profitability. In so doing, it is merely natural to link a new product with popular views of the future that are circulating in the culture at large. When politicians are craving for environmentally safe technologies be sure to emphasize that these can be delivered – if, at least, the government is willing to secure funding for such innovation.

The formulation of bright promises and rosy futures, then, is an inevitable byproduct of any society that is looking for economic and technological growth. As a strategy it contributes to the readiness of policy makers and company managers to put money in some project. Yet, strictly speaking, predictions about what society or a branch of business will look like ten or twenty years from now do not address that non-existent future at all. Rather, they respond to the present; they are meant to determine what should or should not be done today. Claiming that the future will be dominated by interactive systems of communication, for instance, logically implies that people today would do well to start investing in those systems.

So far the futures industry, the techno-branch in particular, has hardly been taken serious by philosophers and social scientists. Although its projections and predictions may indeed have little scientific value, it cannot be denied that these products may have great political ramifications. In this respect, critics, too, sometimes underestimate the extent to which "bad" predictions of the future can still be decisive in guiding collective action. Predictions about the future of a technological project – no less than those about the future of a city, a nation, or the world as a whole – also function as tools for influencing today's decision processes. Therefore, the quality of such predictions is not just a professional concern for futurologists or of relevance to people in some distant future – it is of actual public concern today.

Philosophers are not capable of solving social problems, but they can analyze, or at least try to do so, how we speak about ourselves, as well as about the world, and they may identify and trace what is lacking in our discourse. We are living in a technological culture, a "mode of living" in which technology and culture influence each other in intricate and often unpredictable ways. However, in our contemporary public discourse about the future we tend to take this subtle interplay of culture and technology hardly into account. It is striking to see that time and again our political or cultural ideals are projected onto new, and frequently as of yet unavailable, technologies in a disconcertingly naïve manner. We always seem to be living under the spell of some new invention that is assumed to radically alter our society, as if longstanding traditions and social institutions can be simply erased by some technological novelty. How is it possible

that in our discourse about the future we fall into the same trap time after time? Why is it that in our public debates we are constantly inclined to speak about technological innovations in very positive terms, or, in an attempt to counter such inordinate optimism, in exclusively negative terms?

I am not against reflection about the future per se, not even against making all sorts of fantasies about what lies ahead: anticipation can be wise and useful in many situations. What bothers me, though, is the said naivety or lack of imagination – the superficiality and predictability of our public discourse about the future, in particular as fashioned in political and governmental circles. After all, such public inconsideration or lack of foresight has at least one very concrete implication: it paves the road for various techno-optimist narratives that are disguised as disinterested explorations of the future while, in reality, they serve the interests of specific commercial sectors.

A second potential misunderstanding I would like to avoid is the idea that every critique of the current techno-optimism is automatically dismissed as an instance of doom mongering. It seems to me that pessimist critics like Jacques Ellul and Neil Postman commonly make the same type of errors in their reasoning as their optimist opponents. That I address the views of techno-pessimists in this study only in passing follows from my decision to focus my argument on the contemporary futures industry, which, as it happens, is dominated by an unlimited belief in progress.

This essay is a philosophical study, not merely because its author is a philosopher but because it investigates the quality of public discourse, specifically the contemporary discourse about the future of a group of influential intellectuals and quasi-intellectual businessmen. My emphasis will be on twentieth-century optimistic views of the future, in particular those associated with the development of our technological culture.

Technological Culture

The notion of "technological culture" reminds us of the circumstance that life in advanced industrial societies has become entirely based in technology. Not only does technology create the conditions for culture, it also produces the consumer goods that help us express who we are or

who we want to be. Our identity is shaped by the science and technology that surrounds us everywhere. Brand names like Saab, Sony, and Apple have become lifestyle symbols.

Culture is shaped by technology, but the opposite is true as well, technology is shaped by culture. This suggests a second meaning of "technological culture": technical systems and designs cannot be isolated from social and cultural processes, even though sometimes they might seem to exist as independent forces. But the centrally guided French communications system Minitel betrays an altogether different view of the role of the state than the American Internet; the structure of the first mainframe computers was closely linked up with the needs and values of the Cold War era, the period in which they were developed; and the realization of big infrastructure projects, such as Hoover Dam and the Chunnel, in large measure depends on the shared interests of politics and technology.

Finally, the notion of "technological culture" reveals more about the ways in which we approach the future. The further development of information technology, for instance, not only reflects the economic promise this technology has in the eyes of many, it also tells us more about concrete cultural expectations, involving a longing for smart software and fast chips that might reduce the pressures of work in the future or that might improve the interaction between individuals. This hope is hardly an isolated phenomenon, but suggests that people today, like their medieval counterparts, still dream of Cockaigne, even though this dreamland is now loaded with high-tech. Moreover, since the nineteenth century utopian beliefs have become closely intertwined with a belief in the blessings of science and technology, while technological achievements like bridges, channels, and skyscrapers express a "sense of the sublime," a notion that eighteenth-century philosophers like Edmund Burke and Immanuel Kant still reserved for the domains of art and nature. Yet in industrial societies technology provokes the same mixture of awe and admiration that previously only natural phenomena like storm and thunder could elicit.

Active and Passive Predictions

So far I have used words like promise, expectation, prediction, projection, wish, future vision, and prophecy more or less interchangeably. But a promise differs from an expectation, while a prediction is only in some cases a prophecy as well. Suppose someone makes the following statements:

1. Tomorrow it will snow.
2. I will return the book tomorrow.
3. Tomorrow we'll have pie.
4. Smart technology will extend people's life.

What is a person who articulates a sentence exactly doing? The philosophers of language J. L. Austin and John R. Searle have taught us that speakers are doing three things at the same time. First, they articulate a set of words. Second, in so doing, they refer to something or to some quality of an object. Third, by uttering a sentence, a person makes an assertion, poses a question, gives an order, makes a promise, and so on. This third type of linguistic actions Austin and Searle called illocutionary speech acts. If we apply this to our four sentences, the act in sentence 1 involves "the articulation of an expectation," whereas the speech act in sentence 2 involves "making a promise." These are different illocutionary acts because they have different practical implications. By making a promise the speaker takes on the responsibility to perform a certain act: he claims to *realize* the promise ("Tomorrow the book will be returned") that is implied in his statement. When we state an expectation or make a prediction we do *not* take on this responsibility.

Now let us consider sentence 3. It can be interpreted as an assertion, but also as an expectation or even a promise. It is unclear what kind of speech act the speaker precisely delivers. This gives us little trouble in practice, because generally the tone or context provides more information about the speaker's intent. But in some situations we may want to exploit the ambiguity of a statement, especially in written language. This is exemplified in sentence 4. What are people doing when they utter this sentence? They seem to be expressing an expectation, but in reality they engage in wishful thinking. A wish is no promise, since it does not include the commitment to realize the content of the wish. It nevertheless contains an active element as well: those who articulate a wish seek to influence the course of events, and this does not hold true in case of an articulated expectation. Sentence 4 can also be viewed as a prophecy, a speech act that is related to a wish. A prophecy has an element of expectation or prediction to it, but it is not merely a passive speech act: like a wish a prophecy seeks to influence the way the future looks. Therefore, a prophecy should be seen as an *active* prediction.

Some examples taken from everyday practice may illuminate the relative distinction between passive prediction (a feature of expectations) and active prediction (a feature of prophecies). Meteorologists basically engage in passive prediction: their forecasts are not meant to change the weather. Scientists engage in both modes of prediction. To secure funding for new research activities they speculate about their likely results and their significance for the future of science and society. By thus raising expectations they engage in active prediction: their visions of the future aim to influence the actions of those who can supply the necessary funding. By contrast, ongoing research often involves passive prediction, if, at least, the results of experiments are not pushed into a certain direction for strategic reasons. Sometimes, though, passive predictions may still influence the outcome of a research project, albeit unintentionally. This is called a *self-fulfilling prophecy*, a phenomenon that may well be the result of what started out as active prediction, as in the practice of stockbrokers. Utopias and anti-utopias, generally presenting one either bright or dreadful image of the future, are also common examples of active predictions, as are trend reports and scenario studies. Policy documents, especially those on large-scale urban planning or spatial projects, usually include an array of passive predictions about, for instance, population growth or the rise of the ageing population. At least in the early stages of planning, they tend to juxtapose four or five possible futures, called scripts, scenarios, or perspectives. In this way, they define the range of available options and set the parameters for how the future should fashioned. Despite this multiple plotting, policy documents may be as little objective as the traditional one-dimensional utopian fictions, especially in terms of the values and interests they embody.

Numbers and Models

In complex and unpredictable situations people tend to have a need for fixed points of reference. For centuries, the oracle, the priest and the scholar have taken on the responsibility of providing such sense of security, but since the nineteenth century they increasingly had to compete with solid numbers. It is true that there has always been a close tie between the art of divining and the art of arithmetic; predictive mysticism is mostly based in the manipulation of figures and doing a horoscope requires a lot of calculation. Yet the rise of the democratic state has been accompanied by an explosive growth of the need for numbers and data. Modern social legislation would be

unthinkable, if not impossible, without the development of statistics. One of the odd features of Western democracies is their blind trust in numbers, contemporary historians of statistics argue. Especially in the twentieth century the democratic desire for objectivity has significantly contributed to a situation in which there is a direct correlation between the social status of professional elites and their reliance on quantitative methodologies. Experts are believed, no longer because they are experts but because they supply figures and numbers. In our society, numbers and models have become the pre-eminent signs of objectivity and reliability.

In practice, however, model-based calculations do not offer more accuracy than the model itself allows for. We know for sure that in twenty years individuals who are now forty will be either dead or sixty years old. From experience we are almost certain that a low unemployment rate leads to a rise in sick-leaves. Scientists combine such fixed data or nearly certain patterns in models, yet the way this is done depends on theoretical assumptions that more often than not are hard to corroborate. If anything, model-based calculations tell us more about the model used. In modern-day democracies, politics and economics have become so complex that most agree it is no longer possible to design policies without relying on models. The confidence in numbers is even such that they serve as markers for the future, especially if a quantitative model allows them to be combined with each other.

However, the results of measurements or calculations can never be taken for granted. The futures industry extrapolates and interprets them for their mutual coherence on the basis of conceptual models, but especially in this context the notion of "model" should be put in quotation marks because generally the data are not based on formal systems of mathematical comparison. The futures industry's reliance on numbers and formulas mainly serves a rhetorical purpose; it is a strategy that makes the desires and interests of specific groups look like scientifically founded expectations. In this way, our discourse about the future, a discourse that seems to become more prevalent with each new day, is reminiscent of an old practice: the magical and mystifying effect of formulas has always been deployed in all cultures to defy and tame the future and its uncertainties.

From Planning to Evolution

Since the 1960s our preoccupation with the future has increased significantly, but the nature of this concern has varied. The German philosopher Karl Mannheim elaborated on the role of the future and the extent to which societies can be planned. The idea of malleability or perfectibility is not restricted to societies based on totalitarian ideologies like communism and fascism, he argued in his classic *Man and Society* (1940); liberalist societies seek to actively shape the future as well. Therefore, whether social and economic planning is desirable or possible matters less than how such planning can be accomplished on the basis of democratic conditions. In the 1960s, Dutch economist Fred Polak viewed "futurology" as the solution. This new science would enable the social and political elite to make "informed" decisions on various alternative future scripts to be supplied by futurologists.

Today this planning scheme appears as dated as the sociopolitical utopianism of the nineteenth century. In both cases it is assumed that we can survey all of society from a bird's eye perspective and also start molding its future from that same detached position. It is this idea of total or integral planning from above that is generally repudiated nowadays by those who claim to believe no longer in the malleability of society. This attitude applies to what social scientists refer to as the theory of classic guidance, rather than to the idea of guidance per se. In today's Western democracies, political leadership is geared toward creating the proper conditions for future socioeconomic stability, including balancing budgets, monitoring the effective functioning of all sorts of regulations and procedures, and realizing concrete, short-term results. The traditional top down approach has been replaced by a network approach. In their effort to shape the future, national governments favor a continuous process of deliberation with lower levels of government, social partners, supranational bodies, NGO's, and special interest groups. The resulting negotiation model, aimed at a broadly based policy process and social consensus, is increasingly challenging the more traditional command model.

Across the board, social scientists and experts in public administration have welcomed this development. They rightly reject the naïve rationalism and outright paternalism of an earlier generation of theorists and politicians of the welfare state. This post-paternalist view of governmental guidance, however, has its downside. If, with Auguste Comte, we conceive of society as a theater play, we can point out that today little thought goes into the task and importance of the director. Trendy sociologists favor formal models and concepts such as self-regulating systems, but the rise of systems theory fails to conceal the high level of quixotry in our

current political practice. At all levels of today's welfare state, the number of policy documents, political debates, and public inquiry procedures knows no bounds, but does this automatically mean that governments face up to the future with courage and conviction?

We have ended up, it seems, with a double dilemma, one that affects both the political left and the political right, if these terms still have meaning at all. First, the articulation of coherent visions of the future has fallen into discredit, while at the same time social processes have become more intertwined. Second, while the major political issues are increasingly turning into long-term issues (consider, for instance, the greenhouse effect and the growing division between rich and poor countries as well as between the rich and the poor within the industrialized countries), the neo-liberalist vision of political steering especially encourages interventions that have short-term effects; after all, governments that focus on results have no time to wait for measurable effects to materialize.

Obviously there are counterviews that aim to provide more substance to debates on the future of our technological culture. National scientific councils, specialized think tanks, UN councils, nonprofit foundations, and governmental agencies try to generate concrete knowledge and raise the public awareness of the future. But often, unfortunately, they go against the current. Once politics and governments discarded the theory of classic guidance, they opened up the opportunity for the techno-branch of the futures industry to bear its stamp on the various debates that address the future. Now that the active effort aimed at planning our society in a comprehensive manner has subsided, the public sphere runs the risk of being inundated by prophecies that cut off further debates about the nature and future of our technological culture, instead of enabling and nourishing such debates. Frequently, the high expectations of what science and technology may accomplish to improve human life, increase global peace, and save the environment hide a quasi-evolutionary view of society – a view that, in effect, renders any form of public debate superfluous. It is a form of determinism I call *technological finalism*.

I refer to a finalistic view of social development because it assumes, mostly implicitly, that human agency is determined by an innate force that leads us to a pre-given goal. This finalism is determinist because it suggests that social change is subject to laws and patterns that basically exist beyond human control. Technological finalism is an evolutionary mode of thinking in the sense that it considers the growth of technology as analogous to the evolution of species; it is quasi-evolutionary because it excludes one minor yet essential ingredient from

classic Darwinian theory. This theory argues that the evolution process is blind and hence non-teleological, but contemporary finalist prophets have abolished this distinction between evolution and progress.

Technological finalism reflects a *neo-liberal* view of government and society, because this mode of prophecy discourages political guidance of scientific and technological developments. A society should create and maintain a productive environment for innovation, for instance, by fostering public and private state-of-the-art research and ensuring quality higher education, especially in the technical disciplines. Only after scientific and technological knowledge have been generated, governments should step in and regulate it, albeit on a limited basis. This regulation consists of two tasks: they should stimulate the economic and social application of new knowledge as much as possible and they should try to avoid its abuse. Although governments sometimes fail to accomplish the latter task, science and technology are by and large a blessing for humanity, especially in the long run. Modern neo-liberal prophets who address the future in this quasi-evolutionary way may be aware that science and technology can create havoc, but they point out that solutions – to, for instance, the greenhouse effect or traffic congestion – basically need to be found in the same technological domain. In due course, the most radical advocates of technological finalism argue, new innovations will be able to solve nearly all our problems. Scarcity and violence will soon belong to the past; and this may even be true of death.

Critique

As indicated, my notion of "futures industry" does not include everyone who is professionally engaged in predicting the future. This essay is primarily concerned with those who speak and write about the future of society, culture, and the special role of technology. This explains why I remain silent about astrologists as well as meteorologists. Moreover, I further limit my use of the term "futures industry" by specifically linking it to the discourse of technological finalism. Rather than claiming that the future of our technological culture is exclusively framed in terms of this discourse, I argue that right now it is certainly one of our dominant discourses about the future.

My critique of the futures industry comprises a broad-based study of the quality of the predictions it produces. I consider the history, culture, and language of predicting and argue the position that modern practices of prophecy hardly differ, in essence, from pre-modern modes of active prediction. In every instance this activity turns out to be bound by specific styles and rhetorical strategies. Like the Old Testament prophecies and the literary utopias of more recent date, contemporary futurologist narratives have a fixed plot. The old and the new stories also share a similar social and political function: they try to bring order to a hodgepodge of events and developments. This does not occur in a neutral manner, as time and again it involves reminding the implied audience of what is important in life. Successful fictions of the future function as a compass, as a map that helps individuals guide their actions in unfamiliar territory. These days, for instance, it is dogmatically asserted that the *individualization* of lifestyles will go on unabatedly, that the *globalization* of the economy has only started, and the *miniaturization* of technology has not even come close to what is possible. Strictly speaking, these predictions cannot be tested empirically, for the future does not (yet) exist. The issue that concerns me in this essay, then, does not involve the nature of the future itself, but – to emphasize this point once more – the current neo-liberal discourse about the future. This means that those who enjoy reading predictions are holding the wrong book in their hands.

Many of those who study the future make it seem as if their estimation of what the twenty-first century has in store for us is an entirely disinterested endeavor, yet they simultaneously impress upon us not only a concrete political message but also a quite specific attitude vis-à-vis the future. In the absence of an empirical frame of reference it is easy to present the future as the inevitable product of linear trends as those just mentioned – as something that *in the long run* will be of benefit to everyone. This speaking in terms of inevitabilities has led, in my opinion, to a deterioration of the public debates about the collective fashioning of the future. Since the mid-1980s, moreover, the futures industry has been sending an unambiguous but overly simplified message about our economy: do not touch the essence of the free market, otherwise we run the risk of endangering our technological progress, and hence our social progress.

At the turn of the millennium, our world is undergoing rapid changes because of the interplay of politics, economy, and society. While many argue that liberal capitalism has been tamed by regulation and governmental control, others believe the private sector to have more power to push our future into a specific direction than ever before, mainly because of the radical

growth of the information and communication technologies. It is impossible, of course, to understand the rise of the neo-liberal, finalist style of thinking about the future adequately without taking these recent socioeconomic developments into account. But how and to what extent should the future be an issue of public interest and concern? One of the major tasks of this study is to situate this contemporary sociopolitical uncertainty about what lies ahead in our larger historical and cultural discourse of modernity.

Smarter All the Time?

> Our brains are not in a vat, but in our bodies.
> Our minds are not in our bodies, but in the world.
>
> Clifford Geertz, *Available Light* (1999)

The Belief in Smart Technology

The longing for a better life always involves material and immaterial elements. In modern Western societies, religious and political ideals have become linked up with the desire to possess more or better high-tech appliances and systems. Many people believe that the development of what is called "smart" technology does not merely serve an economic purpose, as advances in biotechnology and the information and communication technologies would also do away with nearly all the limitations that are still tied to human nature. In this way, the longing for "smart" technology reveals a mixture of motifs associated with postmodern themes and a contemporary sense of Cockaigne. A characteristic description from the 1990s is found in the following words:

> Imagine that your wristwatch communicates continuously with your pocket computer; the computer's electronic clock provides the time information, so the watch reduces to a simple, conveniently located display with no internal time-keeping mechanism or adjustment buttons to push….
> Now extend the idea. Anticipate the moment at which all your personal electronic devices – headphone audio player, cellular telephone, pager, dictaphone, camcorder, personal digital assistant (PDA), electronic stylus, radiomodem, calculator, Loran positioning system, smart spectacles, VCR remote, data glove, electronic jogging shoes that count your steps and flash warning signals at oncoming cars, medical monitoring system, pacemaker (if you are so unfortunate), and anything else that you might habitually wear or

> occasionally carry – can seamlessly be linked in a wireless bodynet that allows them to function as an integrated system and connects them to the worldwide digital network.

These words are from *City of Bits* (1995) by William Mitchell, Professor of Architecture at the Massachusetts Institute of Technology. Pushing his point a little further he adds that miniature electronic products will be placed in our bodies to allow our nervous system to plug into the worldwide digital net. From that moment we will have become another being, and it is questionable whether the term "human" still applies: "You will have become a modular, reconfigurable, infinitely extensible cyborg."

One more step? No problem. After the boundaries of bodies and electronic systems have been broken down, we soon will begin to blend into the architecture, Mitchell fantasizes. Some of our electronic organs, for instance, may be built into our surroundings, which will ultimately destabilize the boundaries between "inside" and "outside": "Your room and your home will become part of you, and you will become part of them."

These fantasies cannot be simply discarded, however, as the private hang-ups of some eccentric professor. For decades now the distinction between human and machine is believed by those in the world of information technology to have reached its final stage. In fifty years robots that have human intelligence will be a normal phenomenon, computer expert Hans Moravec suggests in his by now classic *Mind Children: The Future of Robot and Human Intelligence* (1988). As one of the first he projected the rise of "astronomically intelligent robots" that are so smart that they will speed up their own evolution, thereby swiftly passing humans in terms of their evolution, leaving them behind in a cloud of dust. In order to be able to at least keep up with these new, super smart beings, we will download our intellect in cyberspace in the near future. Moravec describes how within decades robotic surgeons will open up our brain, scan each layer of brain tissue, and on the basis of the generated data fabricate a purely mental being, a virtual consciousness that after it is liberated from the body may exist eternally, if, at least, sufficient backups are made. Recently, the information specialist Ray Kurzweil confirmed this prediction, even though he pushed the moment at which we all will have turned into machines, or, rather, software, a little forward in time. As he writes in *The Age of Spiritual Machines* (1998), he expects today's youth to see this wonder become a reality.

In *The Fourth Discontinuity: The Co-Evolution of Humans and Machines* (1993), philosopher Bruce Mazlish has tried to design a past that fits this type of future. In this new version of history human beings are vain by nature; they attribute themselves a privileged position in the cosmos for no good reason. Piece by piece, scientific progress has chipped away this vanity. Copernicus made an end to the "first discontinuity" by demonstrating that the earth is just part of a larger whole. Darwin did away with the second discontinuity by considering humans an animal species, while Freud unveiled the third discontinuity by no longer separating mind from body. On the road to veritable self-knowledge, then, humans still need to take one more hurdle: the arrogant view that as living beings we radically differ from machines. Entirely along the lines of technological finalism, Mazlish predicts this "fourth discontinuity" will soon be discarded, so that humans may finally reach a state of spiritual maturity.

Technological finalism, as I argued in Chapter 3, involves a style of reasoning that seriously narrows the focus of political debates. After all, this style of reasoning assumes to know the destination of "the road that lies ahead" (Bill Gates). "Telematics takes command," Mitchell writes in his new book *E-Topia* (2000). And this is exactly how it is – at least in the minds of those who embrace this style of reasoning. But why should we choose to take the road that may lead us to the utopian futures of people like Gates, Mitchell, Moravec, or Mazlish without first having a serious public discussion? In the absence of such debate private investors may be tricked into making enormous investments, but, more troublesome still, governments are pushed to spend substantial amount of tax money on stimulating research and creating markets for all kinds of information technology as well. If we believe in the future digirati like to hold up for us, new generations of micro processors have to be developed that are even smaller and faster than the currently available chips; new materials and machines have to be designed to produce the super chips that are needed; new data networks have to be implemented; and huge investments are required for developing new software languages that enhance the memory and computational power needed for performing "intelligent" tasks.

Furthermore, a future in which cyborgs and humans can no longer be distinguished from each other is not necessarily attractive to everyone. Philip Dick, in his science fiction novel *Do Androids Dream of Electric Sheep?* (1968), evokes a world in which cyborgs, or androids, revolt against humans. The movie that is based on this book, *Blade Runner* (1982) depicts a Los Angeles in the year 2005 in which no one likes to live anymore: the city has changed into a

technological jungle in which the hunt for revolting cyborgs has corrupted public life. In many of his other writings, Dick argues against our tendency toward creating more perfect mirror images of ourselves, a theme that is encountered in many future-oriented novels. There is a longstanding tradition of stories, for instance, about ambitious engineers who, in their eagerness to be creative, feel themselves equal to God and who, as a direct result of this arrogance, cause unforeseen disasters. Mary Shelly's *Frankenstein* (1817) is an early example of this tradition, as is "the book of machines" in Samuel Butler's utopian satire *Erewhon* (1872) or Karel Capek's play *R.U.R. – Rossum's Universal Robots* (1923).

In today's world, objections against the digital future are generally pushed aside with reference to the notion of "intelligence." Governments increasingly articulate their commitment to invest in digital education for all young children, even though children may benefit more from having good facilities for playing soccer or basketball. Conversely, believers in technological finalism would argue that our world is turning into a genuine knowledge society and that everyone should take part in that race, so as to avoid a division between frontrunners and trailers. In this way history is implicitly conceptualized as one colossal educational project, with a single ultimate aim: more intelligence! Who can be opposed to such grand vision of our task in this world? Those who argue in favor of even more investments in information and communication technology also frequently rely on "intelligence" as a key word of their future vision. All parents would like to have smart children; all teachers hope for smart students; and as pc users we all wish for a computer that will be so smart that it will intuitively "feel" what we want. Mitchell, like Eric Drexler, the prophet of nanotechnology, evokes a seductive world of maximal user convenience – a world in which not a single object is bothersome, not a single appliance strange, for all technology has become "part of you." That in such a world death itself is vanquished, as Moravec suggests, will hardly surprise us: after all, this desire is part and parcel of all dreams about Cockaigne. The enticing future of eternal life on this earth has continued to be a forceful cultural motif to this day.

Philosopher of technology Langdon Winner, in his *The Whale and the Reactor* (1988), calls politicians "technological sleepwalkers," a notion that certainly rings true here: by overestimating the assumed blessings of ever smarter technology, policymakers forget to contemplate the kind of world we are meanwhile putting in place. The effective message of the ideology of smartness is that by simply investing billions and billions in high-tech we will

eventually solve all problems related to aging, scarcity, and the depletion of natural resources along technological lines.

A Critical Method

We may try to jolt technological sleepwalkers awake, but they will quickly doze off again if philosophers of technology continue to frame technology's advantages or disadvantages in binary terms. But the object of our critique, I would argue, is in need of more detailed scrutiny: which futures, exactly, are at stake here? What should be equally avoided is an unstructured, ad hoc critical approach of the challenges the future poses to us. Below I outline the contours of a critical *method,* which addresses the ideologies involved in concrete future visions and which includes a basic set of questions that should always be applied when trying to understand and assess the meanings and implications of such visions. These questions, I believe, are more important than the answers they may generate. After all, there is hardly a lack in diversity of opinion on the pros and cons of certain innovations or decisions that affect our common future, but unfortunately very few people have a clear understanding of what constitutes a good debate – of the characteristics that determine the quality of opinions and the quality of their exchange. Moreover, the critical method I propose allows us to better structure our debates on the future challenges of our technological culture, which in turn will increase the quality of the decision processes involved.

Four steps can be discerned in this critical method:

1. Begin with a rhetorical analysis of the central concepts and arguments that speakers use to support what they consider a likely or desirable future.
2. Try to make the underlying normative choices explicit.
3. Try to identify incongruities or paradoxes in discourses about concrete futures.
4. Move beyond the level of the language and analyze the actual practices in which concrete futures will be situated.

The future conceived as a world dominated by smart technology is undoubtedly one of the most powerful *Leitmotifs* of our current technological culture. I will now discuss this version of the future on the basis of the critical method outlined above.

1. Begin with a rhetorical analysis of the central concepts and arguments that speakers use to support what they consider a likely or desirable future.

From a rhetorical point of view, notions like "smart" and "intelligent" mainly function as ideographs. The linguist Michael McGee has defined "ideograph" as an abstract notion in everyday language that refers to a collective obligation to realize a specific yet ambiguous and poorly defined normative goal. In fact, our collectively shifting values or ideals, such as freedom, equality, brotherhood, and democracy, are always – rhetorically speaking – ideographs. An ideograph, McGee claims, legitimizes the use of power and is often an excuse for questionable behavior: everyone will agree that under the aegis of "freedom," for instance, countless crimes have been committed. An ideograph, moreover, seeks to guide the individual behavior of people into a direction that the community may easily recognize as acceptable and even laudable. Ideographs derive their special force from the fact that the meaning of the notion at stake is not fixed. Freedom, equality, or, as in our example, smartness, are abstract notions whose meaning cannot be pinpointed. Instead, they have a flexible or fluid meaning, so they may be deployed in a variety of contexts. In my local newspaper I read, for instance, that a company will begin to market "self-thinking" lawnmowers and that a new organization for "smart architecture" has been established; elsewhere I notice the heading of an article about the development of automobile lights that adjust their force to the outside circumstances: "The light thinks along with you." During the fighting in Yugoslavia in 2000, the NATO forces did not simply "bomb" Serbian targets, but they deployed "smart" rockets that were able to trace their targets on their own. In today's pharmacy one can find "smart" lotions and "smart" pills, whereas today's politicians no longer speak of "spending" tax money, but they refer to "intelligently" investing it.

Already in the 1950s, machines were associated with intellectual human qualities in disciplines like cybernetics and artificial intelligence. The trend to call all sorts of consumer products and political plans "smart" or "intelligent" followed much later. It received a boost when some clever American discovered the acronym "S.M.A.R.T." in the label "Self Monitoring and Reporting Technology." In 1997, the Pathfinder, the vehicle NASA put on Mars, was loaded with this type of technology. Because of the enormous distance to earth and the extremely lengthy response time, engineers designed its operation system in such a way that it could respond independently to unforeseen obstacles. Today, these so-called "intelligent agency

systems" or "expert systems" are being applied on a large scale, not so much in the world of Internet but in all kinds of industrial sectors that are dependent on complex processes that need to be guided and monitored. They are used, for instance, to make the design of aircraft or large tanker ships (which consist of more than fifteen million different pieces) more manageable by dividing the overall structure into separately built components. We also encounter "smart agents" in the automobile industry as welding robots and paint robots. Finally, in that same year, 1997, a group of American and Japanese information specialists put together a global soccer league for their robots, called "Robocup." This initiative significantly raised the interest in small robots that are equipped with S.M.A.R.T. technology.

No matter how impressive these technological developments are, strictly speaking, the word "smart" refers to a machine's ability to process information on its own and to subsequently respond to that information. In this respect, "smart" headlights or lawnmowers are not more than machines that on a very limited scale can take decisions on their own. Yet on account of its increasing popularity, the word "smart" has received a much broader meaning. It is used to make new rhetorical links between ideals and products or technological artifacts. One example of such a new link involves the introduction of all sorts of traffic circulation monitoring systems in automobiles and on highways. The world of traffic is not so much conceived any longer in terms of "automation," an ideograph that a while back used to have a quite positive connotation, but in terms of "intelligence," as in "smart roads" and "smart cars." In this respect, the figure of speech most commonly deployed is the synecdoche, meaning that a specific technological innovation of some part of a system, such as the development of a better feedback mechanism for data recognition, is applied to the system as a whole: having a highway monitored by cameras suddenly turns the entire highway into a "smart" highway.

Ideographs are polygamous. Because their meaning tends to be vague and flexible, they can easily be linked up with other ideographs. In ads and articles "smartness" is often tied to other ideographs like safety, progress, speed, efficiency, concern for the environment, user friendliness, and the capacity for learning. A new bankcard is called "smart and safe"; computers have turned "learning" into a worthwhile endeavor once again, as the Dutch Minister of Education declared at a 1997 European conference; a newly established foundation for "smart" architecture is still uncertain about what a "smart" building" entails but it is quite sure already that smart architecture is always environmentally aware. The author of an article in the largest

Dutch newspaper about the "smart city" associates this new city with being faster, more economical, and more environmentally aware. He argues that innovative businessmen enjoy solving the problems of urban life, such as traffic jams and having to wait in line in front of the cashier: "As the most densely populated country of Europe we are the first to have the benefits of 'smart cities.' Saving time, effort and energy with the help of technology will save us millions of guilders as well." This article addresses the introduction of a number of "smart" technologies in urban areas. It coins the term "smart city" and associates this synecdoche with a number of ideals that are actually mostly in conflict with each other, such as entrepreneurship, user friendliness, environmental concern, and thrift. Smart technology is represented as the one link that instantly does away with the various frictions among these factors.

In a similar vein, marketing experts and advertising companies try to associate a product with multiple, often conflicting ideals. The smart products of the future, we are promised, are all cheap, small, and flexible, and they fulfill various functions at the same time. A smart phone is not just a phone: it is also a notebook, an organizer, and a television. Intelligent appliances function as "personalized" products as well: users simply select the options they need from a given product. In this respect, the digital butler is no different from his living nineteenth-century counterpart: he guards our front door, remembers our preferences, and anticipates our idiosyncrasies. Regardless of the complexity of the functions to be fulfilled, therefore, intelligent technology will always be user friendly. We no longer have to struggle with incomprehensible modes of instruction. Gone are the everyday annoyances of appliances that fail to do what we want them to do. Everything will be part of one or more networks, whereby the complexities of the technologies involved will be hidden behind user-friendly interfaces.

In the 1990s, government planners also became enthralled with the so-called "enticing" future, one in which the ideal of the network society is tied to maximal transparency for everyone. Typically, though, such grand schemes also disclose what should *not* be given special priority. Of course, every citizen should go on line and have easy access to the Internet, but there seems to be less of a need for critical and intelligent citizens who are able to see through the "transparency" of this dream world. The futures industry, while claiming to strive for optimal user friendliness, in fact concocts a world in which only experts know how information and communication networks are functioning. "Smart" interfaces are meant to ensure that the "digilliterates" are able to lead digital lives as well. But what is the meaning of "smart" here? The

Oxford English Dictionary tells us that "smart" has had quite a number of meanings over time. Two of those meanings proponents of the futures industry actively seek to avoid: smart in the sense of "cunning" and smart in the sense of "free and independent thinking."

2. Try to make the underlying normative choices explicit.

To be sure, there is nothing wrong with ambiguities. It is hard to imagine our lives without ambiguities, but they may be less obvious in some situations or they may become harder to pinpoint, and this is true in particular in our conceptualizations of the future. Therefore, the second, philosophical step of our critical method is aimed at rendering explicit the implied normative assumptions of concrete future visions. What matters specifically is to identify what *we* believe to be the proper meaning of the concepts used in descriptions of enticing futures, rather than to identify what others may have in mind when relying on those same concepts. An example may clarify my point. Some people may support the (active) prediction that in the near future the difference between human beings and machines will become obfuscated if not disappear altogether. How we assess the value of this prediction depends in part on the meanings we attach to concepts like "life," "machine," and "intelligence."

What, for instance, do we mean by a "machine"? Generally we refer to an object that has at least the following two characteristics:

1. It is an object that provides users with concrete advantages. A machine allows us to do things that otherwise would not have been possible or that otherwise would have been much harder to accomplish.
2. It is an object that is based on a finite, stable, and traceable connection between input and output.

In other words, machines are neither mysterious nor unpredictable: their output can always be tied to their input and under identical circumstances input X repeatedly leads to output Y.

This definition – borrowed from John Puddefoot's monograph *God and the Machine* (1996) – makes clear that there is no unequivocal answer to the question whether or not a human being can develop into a machine in the future. In light of the first characteristic it becomes obvious that every prediction about the relationship between humans and machines has ethical

dimensions. For example, no matter how technical our debates about biotechnology will turn out to be, there is always the issue of the extent to which we want to have a society in which human beings in certain respects are similar to "machines" like levers, cows, or telephones. Which advantages do machines provide and to whom? Do the advantages outweigh the disadvantages? Consider, for example, the debates on surrogate motherhood or on the extent to which female ovum may be turned into machines in medical laboratories. An important feature of machines, as the second characteristic suggests, is their predictability (even though this by no means implies that their behavior is necessarily routine). Humans may behave like machines in many ways, but whether or not "intelligent" behavior also meets our second characteristic turns out to be very difficult to prove empirically. Moreover, as Hubert L. Dreyfus and others argue, this dilemma cannot be solely framed as an empirical question. Generally, our society values people who come up with creative solutions and who do not always act the same in identical circumstances. Consider, for instance, artists, engineers, and other professionals. Therefore, reducing humans to machines, even "smart" machines, implicitly involves a normative act: certain forms of intelligence, such as calculating rationality, become valued more highly as a result of this type of active predictions than other forms, such as interpretive skills or the talent to act with great caution.

According to authors like Kurzweil, Mitchell, and Moravec, "intelligent" machines will replicate themselves in the future, a theme that is also found in many science fiction novels. Debates about the nature of machines thus lead to debates about our notion of "life," because we tend to associate the power to replicate (or reproduce) with living beings. That "life" easily triggers metaphoric language we all know (cf. the engine died, we had a lively debate), but the philosophical issue at stake here is: which minimal conditions should be met before we consider an object to be "alive" in a non-metaphorical way? All of the following features seem essential:

1. The object maintains itself by deriving energy from its environment.
2. It has the power to reproduce itself.
3. It evolves over time.
4. It is born, it ages, and it dies.
5. It is capable of surviving in a constantly changing environment.
6. Its behavior is guided by both internal and external influences.

A flower or plant meets all these criteria, including the last two, but what about a digital computer? It only meets, in fact, the first requirement! It not only fails to meet, strictly speaking, the second, third, fourth, and fifth criterion, but also the sixth: a computer always needs an external input: it does not perform a task spontaneously, but it is always guided by rules that were inserted from the outside.

Evidently, not all life is "intelligent" life. Yet it is harder to ascertain whether we can only speak of intelligence in the case of (specific) living beings. The answer will depend on what we mean by "intelligence." In everyday life, Puddefoot rightly argues, we call an object "intelligent" if it meets at least three requirements:

1. It responds to new situations in a fitting way.
2. It solves problems in certain, possibly quite limited, circumstances.
3. It can guide itself; it possesses a certain amount of freedom of choice.

The advocates of "artificial intelligence" tend to call an object already "intelligent" if it meets the first two requirements. Therefore, by adding the third requirement in our definition of intelligent behavior we say that machines, as defined above, may be smart, but not intelligent. Intelligence is reserved for living beings that possess "agency." This demarcation does not so much involve the *true* meaning of the word "intelligent," even though, as John Searle has suggested, "simulated cognition" would be a better term for what we now refer to as "artificial intelligence." Rather, our dispute with technological finalists like Mitchell and Moravec involves the nature of the common future we wish to have. One of the normative issues at stake here is tied to an implication of the question Dreyfus raises. Do we indeed want to have a society in which there no longer exists an evaluative difference between creative or reflective behavior – behavior that can never be fully predicted – and behavior that, in principle, can be specified and predicted and programmed?

3. Try to identify incongruities or paradoxes in discourses about concrete futures.

The notion of "intelligent technology" comprises the finalist promise that by introducing "smart" technology the world itself will become "smarter" and more mature. However, it is impossible to

identify a single trend in support of such reasoning. In this respect, Langdon Winner argues that the information society is marked by a "paradox of intelligence" that he characterizes as follows:

> it's clear that as the Information Age matures, growing numbers in our population will approach the world in a state of increasing incompetence and bewilderment. Many institutions simply assume this and exploit the situation as an opportunity: in many fast-food restaurants you will not find numbered keypads on the cash registers, but pictures of hamburgers, french fries, and milkshakes. Social policy decisions, in which spending on education and job training becomes less important, mirror these hardware and software specifications.

The futures industry's emphasis on user friendliness can be understood as an illustration of this paradox. This is not to suggest that I entirely share Winner's view. For one thing, he too easily assumes that it is solely the increase of high-tech that does away with the ideal of equal opportunity. This, however, is merely a reversal of technological determinist reasoning. Moreover, his example is not overly convincing: the use of images and icons is part of our increasing visual culture and such culture does not necessarily go together with the demise of intellectual life. That spending on education has gone up significantly since the Second World War, for instance, is a fact that Winner largely ignores for convenience's sake.

Winner nevertheless touches on an important issue. Stories of Cockaigne always have a sketchy, mysterious side to them; we do not learn, for example, how all the niceties found in that faraway land are produced and by whom. Such myths indeed have a paradoxical structure in the sense that they contain inner contradictions that are hardly visible at first sight. The myth of a world that becomes smarter all the time is no exception to this rule. The façade of an enticing future, in which we may see a more rationally organized information society of well-educated knowledge experts, fails to obscure from view a more realistic image of a future in which everything revolves around rivalry, competition, and the desire to be the best. This second projection, moreover, has a much different look for the well-educated work force of Western Europe than for that of India; it has much more to offer to American farmers than to Mexican agricultural workers. Indeed, what we are facing involves, typically, a future of winners and losers. This same paradox is built into many contemporary utopian views of the future. The ways

in which the longing for technology-based comfort, easy living, and smart work is fashioned in our culture at large reinforces the promotion of a deeply individualized world where people will only have faith in appliances and technology.

Unlike Winner, however, I prefer to speak – for the time being at least – of the characteristics of future plots rather than of actual futures. This distinction between the two levels is crucial. By approaching futures first as texts (step 3) and only later as part of actual social practices (step 4), we can identify narrative ambiguities more easily. Not just Winner but many other contemporary critical philosophers and sociologists display a tendency to reduce all problems associated with the future to the one social problem of potentially decreasing equal opportunity. Although this is surely an important concern, future plots generally have various layers or subtexts that may all contain their own internal contradictions. These contradictions may not only apply to the sociopolitical level (individualization, growing inequality), but they may also have a predominately cultural-political dimension.

Below I focus my attention on contradictions of this latter type. Which cultural-political paradoxes lie dormant in our futurist discourse on the fusion of humans and machines? I have been able to identify four paradoxes.

The knowledge paradox. A recent subtext of the "ever smarter"-myth suggests: smart technology will especially offer us a more intimate world. One of the proponents of this view is Bruce Sterling, a science fiction author and cyberpunk ideologue. As "cyberpunks," Sterling writes in his preface to the *Cyberpunk SF* anthology (1989), we consider technology an integral part of our world and our bodies. He argues that the meaning of technology has changed in the course of the twentieth century. While the early decades witnessed the creation of breath-taking technological wonders like Hoover Dam and the Empire State Building, the century's closing decades are marked by much more individualized and even intimate technological achievements, such as the personal computer, the Sony Walkman, the cellular phone, and soft contact lenses.

The future William Mitchell sketches in his studies draws on this new notion of technology. He argues that the technology of the future is no longer outside of us, but that it has become part of our body. He even suggests that the distinction between outside and inside will eventually disappear. Such plots about the cancellation of the boundary between human beings and technology contain several contradictions. One of them is the knowledge paradox, which

becomes visible when we ask ourselves the following question: technology enters our body and brain, but do we also enter technology, in the sense that we will arrive at a better understanding of it? The opposite appears to be the case: appliances will become so complex that no one any longer understands how these "smart" products exactly do what they were designed to do.

The British author E. M. Forster was quite aware of this paradox in the early years of the twentieth century. In 1909, in response to the technological optimism of H. G. Wells, he wrote "The Machine Stops," a short story in which a super smart machine has basically taken over all human labor. One result of this situation is that people no longer understand their giant machine; the only thing they still know is to worship it by their prayers. Today, we are witnessing a similar mechanism. While all kinds of new technology become directly attached to our skin, if not implanted and hidden under our skin, there are strong signals that the average citizen's understanding of that same technology is decreasing all the time. This paradox, in turn, fosters the belief in technological finalism, because after all, he who understands little of technological innovations is likely to view them as inevitable and almighty.

The convenience paradox. Fishing in the morning, hunting in the afternoon, and philosophizing in the evening – this is what Karl Marx considered the perfect way to spend a day. By moving beyond capitalism, we would also have made an end to haste, stress, and dreariness. Of course, no one believes any longer in the arrival of communism at any point soon, but in many future projections, it seems, echoes of Marx's idyllic hopes for the future continue to reverberate. We only need a little patience before machines that communicate with each other entirely on their own will have taken over all the bothersome work. Similarly, rushing to the supermarket will soon be a thing of the past. At night, while we are asleep, our digital butler goes out shopping for us on the Internet, our digital mobile assistant programs our smart car's trajectory for the next day, and our digital secretary translates our "knowledge product," composed while relaxing in the garden during the day, into as many as twelve languages.

Commonly, smart people demand a lot from themselves as well as from their environment. Would this be radically different if we are surrounded by smart technology? Those who believe in the myth of "intelligent" technology would respond affirmatively: we may impose higher demands on appliances, machines, and networks, without this technology imposing higher demands on *us*. Just as in the old days a man of noble rank could ask whatever he wanted from

his butler without having to return similar services, so we are collectively entering the world of convenience on the wings of the digital revolution. Yet there is a catch here: new technologies are constantly imposing new demands on us. E-mail is a blessing, but after receiving a message the reply button more or less forces us to respond immediately. The laptop is a wonderful invention, but now our employers or customers expect us to be willing to work everywhere: at home, while riding a train or plane, on vacation, and so on. The cellular phone too challenges our habits; how, for instance, should we handle the duty to be reachable everywhere and be accessible for everyone all the time? New digital appliances, no matter how available or easily used, will impose new demands on us.

Put more broadly, our new society of convenience can only survive if we accept the cost and pressures of permanent education. Smart technology can only be developed in knowledge-intensive environments. But such "knowledge parks" do never exist in isolation: they require a type of society in which the socioeconomic demands will go up all the time. The members of new generations are unlikely to have secure jobs, while in all likelihood they will have to be more productive and be constantly willing to learn new skills. Perhaps our conclusion should be, therefore, that no matter how convenient our lives may become on account of smart technology, that same development will simultaneously render our lives more complex and pressured as well. This will in turn increase our *desire* for convenience, rather than that our lives themselves become marked by convenience. The more we drink the thirstier we grow – this, basically, is the tragic message of the convenience paradox.

The interaction paradox. In a third cultural-political subtext the land of Cockaigne symbolizes a living environment that is entirely geared toward human beings. In this environment objects and animals are only there to be at the service of people; it is an environment in which everything is around because of us. This is a characteristic medieval fantasy that can be found, for instance, in the work of church father Saint Thomas Aquinas. He thought that fish swam in schools so that we would have little difficulty in catching them. True enough, there is much attraction in producing a world with objects that are entirely geared toward us. Designers who follow the logic of this postmodern version of the Cockaigne dream, for instance, come up with the idea of "smart" tables, artifacts that adjust themselves to our needs without a murmur. This ideal table expands when our relatives visit, shrinks when we're together with the two of us, and it lowers its legs

when children are playing on it. In their narratives, authors like Sterling and Mitchell also toy with the idea of "smart" appliances that intensify the interaction between humans and machines.

Let us assume, for the sake of argument, that the designers' dreams of Cockaigne will be at least in part realized and that in time we will be surrounded by all sorts of appliances that we can speak to, or, preferably, appliances that register a wink of our eyebrow and then know they have to perform a specific task, or, better still, appliances that already know what to do before we know it ourselves. Notwithstanding the instant appeal that such fantasies have for most of us, we should wonder, it seems to me, whether there is some form of *meaningful* interaction possible with objects that totally cater to satisfying our needs. This concern has a practical side to it as well. Many digirati argue that digital technology turns the production of goods and services into an environmentally friendly affair, but, paradoxically, their emphasis on user friendliness encourages the values of a consumer society in particular. We do not easily get rid of a piano that we learned to play only after long hours of exercise; we tend to develop a personal relationship with some machine or instrument that challenges our skills or pushes us to the limit. By contrast, a product we purchased through the Internet in the-spur-of the-moment and that can be used immediately is also a product that is quickly abandoned for some other toy. The "smart" table that instantly adjusts itself to our needs we will therefore consider an easily replaceable object. Such dream products offer too little resistance, so to speak, to be really noticed, let alone to be suitable as a partner in a lasting relationship. A world designed according to the principles of Cockaigne, then, leads to a material world that is inherently foreign to us. In other words, the interaction paradox comprises a disconcerting prediction: the "smarter" the environment in which we find ourselves, the fewer contacts we will have with it and the more indifferent we will be in our dealings with it. Like so many ideal states, e-topia reveals itself as an anti-utopia.

The expansion paradox. Proponents of artificial intelligence view the body and the earth primarily as factors that impose restrictions on human beings, as dungeons for the individual soul and the collective mind respectively. In the fourth subtext I identify the emphasis is on the longing for mental expansion, both in time and space.

Let us first consider the longing for expansion in time, the desire for immortality in particular. The active prediction that soon we will be able to undo man's fall from grace (which made us mortal) is not only found in the work of contemporary authors like Drexler, Kurzweil,

Mitchell, and Moravec. In the 1960s, for instance, there was a minor boom of futurologist books about deep-freezing the human body. In *The Prospect of Immortality* (19??), Robert Ettinger argues that immortality should be considered a technological possibility. But also before the 1960s scientists were dreaming of conquering death itself. An imaginative exploration of this longing is found, for instance, in *The World, the Flesh and the Devil*, a fairly unknown early work of J. D. Bernal. In his 1929 essay, this physicist, who later would gain fame with a sizable history of the sciences that was inspired by Marxist views, voiced his critique of "the enemies of the Rational Mind." It seemed only natural to the young Bernal that one day we would leave the earth behind. He anticipated the establishment of many space colonies, each of which would need some twenty thousand inhabitants to be self-sufficient. For Bernal the desire to go to some other place in space was very similar to the desire to leave our body behind. Surgery and physiological chemistry would have a crucial role to play in the effort of stepping out of our body. But that was only the beginning:

> Instead of the present body structure we should have the whole framework of some very rigid material, probably not metal but one of the new fibrous substances. In shape it might well be rather a short cylinder. Inside the cylinder, and supported very carefully to prevent shock, is the brain with its nerve connections, immersed in a liquid of the nature of cerebro-spinal fluid, kept circulating over it at a uniform temperature.

Once we are freed from our body our fear of death will evaporate, for in Bernal's account death is vanquished forever.

Yet is it still possible to speak of life if there is no death? Or is, with death, life destroyed as well? This is one of the questions the desire for immortality triggers (and one that Bernal, as well as Drexler and Moravec, forget to ask). At any rate it is clear that a life without a final end has no longer any stages of life. It is in general quite hard to determine the meaning of an act or event if there is no end in sight. After all, what does it still mean to give birth to a baby if you can do that a thousand times over? Paradoxically, the perspective of eternal life would banish all meaning from everyday life. Moreover, all notions that presuppose some sort of finality, such as upbringing, education, imprisonment, would lose their significance. King Fosca, the protagonist of Simone de Beauvoir's novel *All Humans Are Mortal* (1946) personally experiences the

gruesome effects of this paradox: his immortality proves to be a curse that completely estranges him from life. The eternally living Emilia Marty in Janáček's opera *The Case Makropulos*, after the play by Karel Capek of the same title from 1922, has eventually no other desire than to die. And the island of Luggnagg, we learn from Jonathan Swift's *Gulliver's Travels* (1726), is not only inhabited by ordinary people but also by a small group of Struldbruggs or Immortals. Their fate, so it turns out, is not something to be envious of:

> When they came to Fourscore Years, which is reckoned the Extremity of living in this Country, they had not only all the Follies and Infirmities of other old Men, but many more which arose from the dreadful Prospect of never dying. They were not only opionative, peevish, covetous, morose, vain, talkative; but uncapable of Friendship, and dead to all natural Affection, which never descended below their Grandchildren. Envy and impotent Desires, are their prevailing Passions.

Evidently, the point of these stories is lost on immortality thinkers. To be able to perfect ourselves we have to destroy ourselves, Bernal's fantasy teaches us, and such fantasy – we have ample reason to worry – is still very much around.

The desire to live on in time is often closely tied to the desire for expansion in space. We will have to leave the earth, as in Bernal's story, in which the intellectual elite colonizes the cosmos. Yet this desire may also refer to the active prediction that at one point in time people will transcend the borders of their own consciousness. Bernal, for instance, dreams of an expanding virtual space: individual minds, once freed from their bodies, would also be able to achieve much more intimate contacts with each other than we, in our embodied state, can imagine. He even predicts that people, once liberated from the body and the passions that come with it, would ultimately fuse into one powerful mind.

In summing up, we may say that in his utopia Bernal creates a link between three expansion themes: the desire to live longer in time, the desire to leave the earth, and the desire to transcend the body. This combination has proven to be paradigmatic: we since encounter it in the work of many prophets of the future, including Marshall McLuhan and other disciples of "transhumanism." An important spokesperson of these "transhumanist" desires in Europe is Peter

Cochrane, director of research with British Telecom. In 1996 he invited the readers of his column in *The Daily Telegraph* to join the following thought experiment:

> Just imagine the solution to Fermat's last problem, not scribbled on paper and lost for ever, but recorded for all time. Alternatively, the many works and ideas of Newton that never saw the light of day. Perhaps, more powerfully we should contemplate artificial intelligence systems able to access such works, the coalescing of myriad concepts and results that currently escape us due to our limited human ability and memory. Perhaps in future, none of us will die in the strict sense, but our essence, an echo of our passing will live on. Perhaps then we will become a hybrid being, a network of total experience, learning and understanding continuously incremented by the inputs and interactions of a peripheral work force of individual human minds acting in unison with us. At 49 years old, and another decade or two to realise this world, I might just see you there.

There is a gap of some seventy years between the idea of putting human brains into cylinders and the idea of putting "the informational content" of our brain on a CD or on the Internet. Significantly, the images have changed, but the ultimate fantasy of the frequently male "nerds" who are, predictably, stupefied by their own body and the capriciousness of life is still riddled with the same paradox. From Bernal to Cochrane, each time there is more at stake than conquering death; what these men want is banish all contingency, overcome each limitation, and be ahead of each new change.

Technology turns society into a more changeable entity and makes individual life more complex; it opens up opportunities, but it forces people to make more decisions. Yet precisely the high priests of our technological culture are spreading the gospel of security, simplicity, and harmony. In the future that authors like Bernal, Mitchell, and Cochrane hold up for us we can live without having to die, we win without having to lose some, and we memorize our entire past and are still not being overwhelmed by history. In such a future we will ultimately coincide with our surroundings and become part of networks without losing our individuality. Their desire for the unlimited expansion of life in both time and space is a (post)modern version of the child's wish to live in Cockaigne. Dutch columnist Hans Ree suggested some years ago that there is no distinction whatsoever between the scientific fantasies designed by the avant-garde of the

computer ideologues and "the world's twaddle." His syntax says it all: "We all one, in a spirited universe. Old dream of mystics. Child's dream in desolate Offline World. Man sits down behind his computer, becomes a child again, and finally disappears in an ocean of all-encompassing love."

Recently, computer scientist Bill Joy voiced his worries about the childlike dreams of his colleagues. In "Why the Future Doesn't Need Us," an article that originally appeared in *Wired* (2000), he warns that in chasing ideals of immortality we run the risk of losing our "humanity." Despite receiving much response, Joy's views are little more than a variation on the all too familiar Frankenstein motif: Be careful when making smart robots, for before you know it they take control of everything. However, what is of more relevance here, it seems to me, is that the value of boundaries and the meaning of limitations are systematically denied.

The importance of finality, for example, tends to be underestimated in much reflection about the future. Finality has always been an important principle of social organization: every society assumes a given duration of life as well as a specific relationship between the various stages of life. Dutch philosopher Trudy van Asperen argued in her study *Het bedachte leven* (The invented life, 1993) that this principle is challenged, though, on account of the ongoing demystification and individualization. As a result, striving for purely individual enjoyment has become much more accepted as a value, if not taken for granted. A life that aims to have as many joyful or blissful experiences as possible also operates within a different temporal frame. In what Schulze called the "experience society" one moment is as good as another: those who live longer simply gather more experiences. Van Asperen proposes a different view in which each human life is seen as a "finite" design into which we have to evolve and in which we can also accomplish some sense of completion through that very process of growth. Life, put differently, is viewed as a narrative that not merely goes on and on, but that has a beginning, a middle, and an ending. In her critique, Van Asperen does not challenge technological progress, but the blind faith in such progress – precisely because such faith may itself threaten progress. Finiteness, she feels, is no limitation that should be canceled as soon as possible by all the digital and biotechnological tools we have at our disposal. The awareness that we have to die one day does not lead to despair, but provides order to life and hence quality. After all, a story without plot or ending may perhaps last forever, but it will never be very exciting.

4. Move beyond the level of the language and analyze the actual practices in which concrete futures will be situated.

Mainly as a result of our educational system's organization and the rise of psychological testing, we have increasingly begun to understand "intelligence" as a possession, as something you either have or don't have. Just as one individual owns more money than someone else, some other person has more intelligence. Yet isn't this view misleading? A comparison with our notion of "skill" is revealing: we say that person x has more or better skills than person y, but this always involves a quite specific activity or practical domain (such as fixing dinner, teaching, repairing a bicycle's flat tire). In other words, we do not tend to see "skill" as an intrinsic personal trait, as a possession of which you calculate the size. More than intelligence, skill has remained a relational and hence changeable feature.

Given this distinction, what do mean by "smart" technology? Is it an intrinsic feature or a relational one? Based on detailed case studies, sociologists of technology have convincingly argued that appliances and technical systems derive their meaning primarily from the practices of which they are an integral part. Without taking this context into consideration, it is impossible to determine whether a specific apparatus works well or not, whether one subway system is "smarter" than another. The issue here does not merely involve a linguistic ploy, but concerns two diametrically opposed ways of approaching the future.

Policy makers who consider "smartness" an intrinsic quality of new technology will prioritize a technocratic approach of social problems. They are unlikely to come up with alternative solutions; after all, solutions that do not depend on smart technology only exist outside of this technocratic paradigm. Moreover, those who embrace its logic can be expected to view the systems that are in place as antiquated or even "silly," a situation that can only be reversed, they reason, by new technology. Let me discuss a recent example to illustrate my point. As part of the effort to design a national traffic circulation and transportation policy, the Dutch government published a preliminary report in February of 1999. The report suggests that mobility and traffic circulation will continue to go up nationwide. This process is basically seen as a good thing, because it signals economic growth and more prosperity. Yet the report also acknowledges that further growth will put significantly more pressure on the available highway infrastructure, the expansion of which can only be realized on very a limited scale, especially given "the harm it will do to the landscape and the environment." What should be done? The report concludes that

"a major option" is to optimize the potential of the existing highway system, an approach that may benefit from technological opportunities. The government has high expectations in particular of what is identified as "new technology":

> New technology offers an enticing perspective, both for solving environmental problems and improving the capacity and quality of the traffic circulation and transportation system, including traffic safety. The information and communication technologies (ICT) offer concrete opportunities for making the traffic circulation and transportation system smarter and more efficient. These should be exploited to the utmost.

The report also suggests that those who use the highway system should pay for it as well. However, to be able to turn the "cost of mobility" into an effective policy instrument, much "new" technology is needed. The authors of the report do not refer to technologies that make it possible for the highways to handle more volume, such as Advanced Cruise Control or Intelligent Speed Adaptation, but to technologies that allow the government to put a nationwide system in place that enables it to pass on the cost of the highway system to the user or consumer. Specifically, these include positioning systems, mobile communication systems, computerized navigation systems, and electronic vehicle identification systems. In this way, "new" technology is understood as a whole set of "smart" technologies that solve our contemporary mobility problems. In addition to the enthusiasm for smart technologies, the report also touches on potential drawbacks; it is suggested, for instance, that a growth in traffic volume may reverse the gains derived from new technologies. The implementation of "smart" systems may thus have a rather "silly" effect, yet given the report's technocratic paradigm, such qualification is merely mentioned in passing – as an aside.

Our approach of social problems is more productive, I believe, if policy makers start from the assumption that "smartness" is only established in concrete practices, if they conceive of it as a relational quality rather than an intrinsic one. I borrow a recent example from an essay on the notion "mobility practice" by Dutch social philosopher Peter Peters. He discusses this notion on the basis of a comparison between the role of bicycles in downtown Amsterdam and Houten, a suburb near Utrecht. In Amsterdam there has been an ongoing struggle for the available space between the various types of slow traffic, motorized traffic, and public transportation. "Riding

your bicycle in Amsterdam feels like a journey through the jungle, whereby the survival of the fittest is the only law that counts," one member of the local Bicycle Association is quoted as saying. By contrast, the local traffic circulation system of Houten, which was planned in the 1970s, starts from the bicycle as the basic mode of transportation. This means that all major local facilities can be easily reached by bike, that there are plenty of separate, well-lighted bicycle paths, and that even in the way the traffic lights are operated bicyclists are given priority over other modes of traffic. This example suggests a way to question the technocratic desire for more smart technology. You may design a beautiful high-tech bicycle, but if you do not change the downtown traffic circulation system of Amsterdam, this bicycle will remain a foolish investment in this specific urban context. Conversely, in Houten an old rusty bicycle without any fancy built-in technology will prove to be a smarter mode of transportation than the most expensive automobile, a fact no smart navigation systems or intelligent speed adaptation technology will challenge.

Of course, in some situations high-tech may be the only key to a solution, but in other situations simple technology may do just as well. Moreover, the deployment of more advanced information and communication technologies fails to provide guarantees against unforeseeable side effects. It seems unwarranted, therefore, to confide in it in advance, and we better take seriously the view that in the context of technological development "intelligence" is always a relational concept. This insight may also encourage us to see the future once again as a contemporary arena, for it forces policy makers to frame the dilemmas of the future as concerns of the present, instead of brushing them aside as long-term issues. Should we really look at the ongoing growth of mobility as the basic principle of all policies? Do experiments as the one in Houten have implications for other, large-scale contexts? How do we stimulate new ways of thinking about planning cities and highway systems in the Netherlands? These questions are not posed in the Dutch government's preliminary report on future mobility and transportation policies. Although several scenarios are presented, the differences seem so marginal that they hardly give rise to debate, let alone new debates. That the automobile has the final say in what the country will look like is basically taken for granted.

Democratizing Technological Culture

Citizens need to be able to influence the direction of their lives as well as the design of their environment. In our knowledge society, however, these tasks have become quite complex; various large-scale processes have made it harder to shape our lives and futures according to our needs or desires. Efforts to democratize our technological culture try to counter this trend. They are specifically aimed at creating new contexts for debate and they explore the potential of marketing and advertising techniques for fostering reflection on phenomena like gene technology or the expansion of large infrastructure projects such as airports. Yet the term "democratization" does not simply refer to the goal of giving as much power as possible to as many people as possible. More important is the ideal of equipping citizens with new competencies, so they will be capable of having a meaningful input in public debates. After all, there is hardly any value in debates that show little or no promise for educating or raising the awareness of the participants involved. It is precisely in this sense that the critical method I presented in this chapter, based on the example of contemporary culture's concern for "smart" technology, aspires to increase the democratic level of major decision processes that involve our common future. At least this method suggests how we may question technological-finalist ways of thinking that are in fact geared toward avoiding debates on such matters.

To be sure, our new version of Cockaigne as a land that abounds in smart technology is a pipedream. But with no or only little knowledge of the complexities involved in the interactions of technology, economy, and culture, this dream proves hard to resist. Technological finalism assumes that all who are interested in a better future have to go down the same road. Strikingly, it is not only scientists and engineers with concrete stakes in information technology that reason along the lines of this ideology, but also many citizens, public officers, and politicians appear to see no alternative. By combining views and approaches from a variety of disciplinary angles, I have tried to question projections of a smart future. The point of my critical method is not to suggest that we should begin to distrust technological progress, for one should always try to move beyond thinking in binary terms of either more or less technology. Technological innovations may lengthen the duration of our lives, make us more mobile, offer us more entertainment, and allow us to process more information. But no matter how "smart" new technologies may be, the nature of the social and cultural changes they trigger continues to be very hard to foretell. This is why I believe the desire of transferring intelligence – in any definition – as much as possible from humans to machines and systems to be a misguided

ambition. Smart technology can only be smart if we use it in a skilful and socially appropriate manner. We need to reflect on the future in a more qualitative way rather than blindly trusting the smartness of our future technology. Given this concern, public debates about ways of organizing the future might be improved in three areas:

1. Developing a more critical way of dealing with the future means that we are aware of the paradoxical nature of enticing futures (including the stories in which they are couched). Democratic policies are characterized by the fact that the future is understood in terms of dilemmas. This allows space for normative choices and issues, because the dream of Cockaigne – that it is possible to reconcile everything with everything – is left behind. Technical solutions may well be very smart when looked at in isolation, but this does not say anything about the implications for their interaction with their environment or with other smart technologies.

2. A critical approach of the future expresses itself in relational styles of thinking as well. Everything has meaning only in relation to other meanings. This is as true for new technologies as it is for new words. The relational style of reflection I advocate encourages futurologists to be attentive to interactive relationships between instruments and goals: technological artifacts are no neutral tools vis-à-vis the normative or political objectives they serve: the meanings of concrete instruments and goals are only constituted in their interaction. If the main goals of a traffic circulation policy are "fluidity" and "accessibility," quite soon we will end up with technical instruments such as Advanced Cruise Control or Intelligent Speed Adaptation. Another example involves the introduction of the drunkometer and the blood test. These instruments have given new cultural meanings to "driving while intoxicated." This concept, including the implied goal of driving without drinking, refers only indirectly to observable driving behavior, such as zigzagging, for today we understand a drunken driver primarily as someone who has a certain amount of alcohol in his blood, a level that can only be made visible through measurements. However, that we decided to standardize "drunkenness" with the help of technical means – rather than, for instance, applying "tiredness" as a criterion – has a cultural background: the bourgeoisie has always viewed too much drinking as a larger threat or specter than too much working. Evidently, culture and technology have become closely intertwined, not only on the electronic highway, but also in everyday life.

3. Relational styles of thinking encourage those who are professionally engaged in the future and other participants in debates about the future to always evaluate technology from the

angle of user practices. As we have seen, whether or not a bicycle is “smart” entirely depends on the practical situation in which this mode of transportation is meant to function. A socially responsible way of dealing with the future based on this relational approach might lead to better design formulas. The designers of an innovative copier may view their creation as a very smart machine, but its true value is only proven in concrete situations. An architect may call his new office building “intelligent,” but if the people who work there fail to properly understand the building’s merits little is achieved. This insight, however, has led to different, more interactive design approaches in remarkably few cases so far. For decades, postal deliverers used vans with a low driver’s seat out of which they had to raise themselves countless times each day; only since a few years there are vans available on the market that are specially designed for people who have to get in and out of it a lot. In 1998 a trainee introduced relational thinking in the design department of a major automobile manufacturer specializing in large trucks: she was the company’s first designer who decided to join drivers on their long trips to see how in everyday practice they used the truck’s dashboard; not surprisingly, she instantly noticed elements that would improve the dashboard’s design and bring it more into line with the drivers’ needs. These examples, no matter how minor they may seem from a strictly academic point of view, underscore the significance of pragmatism for a more democratic design of the future. The “intelligence” of a product, in other words, depends on the talent of designers to imagine how users deal with it, rather than on the high-tech character of the product itself.