

Design, the Future and the Human Spirit

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Introduction

Designers, like everyone else on the planet, have good reason to be concerned about the future. The world is volatile, and the ability of the human race to make a healthy home for itself is at stake. Threats from global warming, poor nutrition, disease, terrorism, and nuclear weapons challenge the potential of everyone to exercise productive energies for the common good.

Designers are certainly among those whose positive contributions are essential to the building of a more humane world. Trained in many disciplines—whether product design, architecture, engineering, visual communication, or software development—they are responsible for the artifacts, systems, and environments that make up the social world—bridges, buildings, the Internet, transportation, advertising, and clothing, to cite only a few examples. Companies would have nothing to manufacture without designers, nor would they have services to offer.

Paradoxically, designers united as a professional class could be inordinately powerful and yet their voices in the various fora where social policies and plans are discussed and debated are rarely present. While the world has heard many calls for social change, few have come from designers themselves, in part because the design community has not produced its own arguments about what kinds of change it would like to see. Notwithstanding the discursive and practical potential to address this issue, the worldwide design community has yet to generate profession-wide visions of how its energies might be harnessed for social ends.¹

As creators of models, prototypes, and propositions, designers occupy a dialectical space between the world that is and the world that could be. Informed by the past and the present, their activity is oriented towards the future. They operate in situations that call for interventions, and they have the unique ability to turn these interventions into material and immaterial forms. Granted that others usually define the conditions of their work, designers still create the artifacts that are put to use in the social world.

At issue in any call for designers to act is the question of their autonomy or ability to set their own agendas. Initial support for this ability came from Tomás Maldonado and other design theorists in Italy beginning in the 1970s. They characterized the designer as one

1 There have been noble efforts such as the ICSID "Humane Village" Congress in Toronto in 1997, with inspiring words by the keynote speakers (Paul Hawken, Rabbi Michael Lerner, and others) but, in the end, the congress left only a modest legacy of ideas for building a constructive future.

who projects or makes projects, and they spoke about the *cultura del progetto* or “culture of the project.” Maldonado strongly articulated his position in a seminal, 1970 book *La Speranza Progettuale* which was translated into English two years later as *Design, Nature and Revolution: Toward a Critical Ecology*. As a core theme, Maldonado focused on the “human environment,” which he characterized as “one of the many subsystems that compose the vast ecological system of nature.”² Following a systems theory model, he claimed that among subsystems, “only ours possesses today the virtual and real capacity of provoking *substantial*—that is irreversible—disturbances in the equilibrium of other subsystems.”³ Designers are complicit in this process, but Maldonado raised the question of how their role could change. The impetus for his book was the urgency he felt to counter the rapid degradation of the environment and, although he recognized that autonomous design action is difficult in any social system, he urged a substantial effort on the designer’s part to play a role in a process of social change.

Maldonado emphasized autonomy, recognizing it as a difficult state to achieve. Nevertheless, he made the Sartrean argument that “[h]owever things are, the designer must act, he must definitely abandon the ‘waiting room’ in which he has been forced to remain until now. And he must act even if he does not know whether in the end autonomy will not prove to be an illusion.”⁴

Actually, many recent innovations in technology have enabled designers to gain more autonomy as producers and distributors of products. Espousing the theory that modest individual actions are viable starting points for social change, I wrote a short essay several years ago entitled “The Designer as Producer,” in which I argued that the individual designer now has the power to launch an enterprise or project by using the abundant resources of the Internet for custom manufacturing, warehousing, promotion, and distribution.⁵

More Than One Future

How does a designer formulate a role as a change agent and determine a course of action? To do so means to consider both the past and the present, which have been embodied or are embodied in concrete activities and artifacts. From the dialectic of past and present come the situations that determine the possibilities for the future. To plan effectively in the present requires a vision of what the future could and should be. I use both the conditional “could” and the prescriptive “should” to suggest, in the first case, that the future is always based on the contingency of human choices and, in the second, to assert that these choices need to be driven by a consideration of what ought to be done. I would also make a distinction between *predictive* and *prescriptive* future scenarios. A predictive scenario is based on what could happen. Its methodologies involve gathering data and organizing it into patterns that make reflection on future possibilities more plausible. Creators of predictive scenarios recognize that the

2 Tomás Maldonado, *Design, Nature, and Revolution*. Translated from the Italian by Mario Domandi (New York: Harper & Row, 1972), 4.

3 Ibid.

4 Ibid., 74

5 See Victor Margolin, “The Designer as Producer: Working Outside Mainstream Manufacturing” in *Citizen Designer: Perspectives on Design Responsibility*, Stephen Heller and Veronique Vienne, eds. (New York: Allworth Press, 2003).

events or activities they study are too complex to control by fiat. In contrast, prescriptive scenarios embody strongly articulated visions of what should happen. Data plays a subordinate role in the argument for a specific course of action. Predictive scenarios tend to be pragmatic, while prescriptive ones are idealistic.

One of the few designers to think about the future was William Morris, a protean figure of the nineteenth century, who published a utopian novel, *News from Nowhere*, in 1891. But Morris's vision of the future was a recreation of the past. He sustained a powerful polemic against the prevailing values of his day; thus the rural past offered a more hospitable landscape for a utopian society than the troubled present. I commend Morris's concern for humane values, but his choice of a bygone setting for a future community absolved him from negotiating with the harsh realities of the Industrial Revolution. Yet his interest in the future was almost unique among designers of his time.

Today, the accelerated pace of change requires designers to engage with the future in a more direct way if they are to have a say in shaping it. This is a complex process for which design professionals have not been well prepared. Therefore, it may be helpful to review some of the methods that others use to think about the future to see if they have any relevance for designers.

Whereas early attempts to know the future were based on divination or speculative prediction, the field of future studies emerged after World War II as an attempt to apply sophisticated modeling techniques to the creation of future scenarios. Today, practitioners of such techniques vie with speculative visionaries to generate scenarios for future action. These scenarios range widely in topic as well as rhetorical style. Some are speculative, others prescriptive. Some focus on geopolitics, while others emphasize technology. How then does anyone make sense of such scenarios in order to create an individual or collective plan of action? To do so requires taking into account the various spheres of activity that constitute the social world. It means carefully analyzing the methodologies that forecasters adopt to predict future events within their own spheres of knowledge and interest.

Perhaps the most volatile field of human activity, and the one in which it is most difficult to make predictions or forecasts, is international relations. To create policies for future action, theorists in this field develop geopolitical models of how nations behave towards each other.⁶ Henry Kissinger, for example, introduced the European theory of *realpolitik* to American foreign policy during the Cold War, with results that ranged from *détente* with the Soviet Union to collusion with Latin American dictators. Today, geopolitics remains divided among theorists with competing worldviews.

In 1992, Francis Fukuyama wrote *The End of History and the Last Man*, in which he foresaw the universal adoption of liberal democracy. Recognizing that numerous nations had yet to institute

6 The term "geopolitics," first used in 1899, has multiple and varied meanings. See Gearóid Ó Tuathail, "Problematizing Geopolitics: Survey, Statesmanship and Strategy," *Transactions of the British Institute of Geographers* 19 (1994): 259–272.

this political system, Fukuyama considered them to be temporarily outside history, waiting to realize that liberal democracy was the culminating goal of political involvement. Fukuyama's Enlightenment-based optimism was countered in 1996 by Samuel P. Huntington, who foresaw a "clash of civilizations" in his book *The Clash of Civilizations and the Remaking of World Order*. For Huntington, whose subtext was a call to reaffirm the values of the West in the face of its economic decline, the differences among nations were less a consequence of politics, as Kissinger assumed, and more a matter of culture. Huntington's world system comprises large aggregates of culturally compatible nations that frequently trade with and support each other, but just as often oppose aggregates that differ from them. For Huntington, these cultural groupings often have difficulties in reconciling their differences, thus enabling him to account for the growing polarization between the West and Islam on the one hand, and the tensions arising from China's growing economic and political power on the other.

The geopolitical models of Fukuyama, Huntington, and other recent theorists carry considerable weight among contemporary policy makers who must map the political strategies of nations and international organizations. The models are also of interest to the growing civil society movements that are inventing roles for themselves in the emerging global arena, although neither Fukuyama nor Huntington accounts for the increasing influence of these movements.

Geopolitical theories and their implications for the future are also relevant to design. One of the few designers to make reference to geopolitics is Gui Bonsiepe, who has written cogently about the center-periphery model and its effect on designing in Latin America.⁷ Bonsiepe, for example, has refused to characterize Latin America as a peripheral region that must derive its ideas and models of design practice from the center. Rather, he has sought to empower Latin American designers by urging them to locate their practices within a revisionist geopolitical model that does not relegate their work to the margins of the transnational production and flow of goods and services.

Sometimes design is also included in national strategic plans for industrial development. In Asia, design enabled Japan to change the center/periphery paradigm in the early 1960s by helping it to move from a position that was politically and economically marginal in the global order to one that currently has considerable power. The Japanese model was followed by Korea, and now other Asian countries such as China, Taiwan, and Singapore are repositioning themselves as important centers of design. The "Design Singapore" Initiative, which articulates a design policy for Singapore, clearly states that design promotion is central to the national interest.⁸

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- 7 See Gui Bonsiepe, *El Diseño de la Periferia: Debates y Experiencias* (Mexico City: GG Diseño, 1985) and Bonsiepe, "Developing Countries: Awareness of Design and the Peripheral Condition" in *History of Design: 1919–1990 The Dominion of Design* (Milan: Electa, 1991).
- 8 See, for example, the "Design Singapore Initiative," which can be downloaded from www.designinghub.org.

Because international relations involve many actors with starkly differing agendas, geopolitical models of the future can only be predictive rather than prescriptive. In contrast, the emerging environmental movement of the 1960s emphasized prescriptive models of the earth's future. Environmental activists proclaimed that the environment was a collective human responsibility, and that everyone should be involved in combating its abuse or neglect. This introduced a new element to political relations—common concern—even though the leading geopolitical theorists barely noticed it.

In 1972, the Club of Rome published *Limits to Growth*, a study based on MIT computer models that simulated the relations between the earth's resources and the human population. As a forecasting tool, the study argued that the continued consumption of resources at the current rate was unsustainable. Its call for new sustainable environmental and social policies was continued in subsequent studies—the Bruntland Commission's *Our Common Future* and *Agenda 21: The Earth Summit Strategy to Save Our Planet*. Both originated within the United Nations system, the latter in conjunction with the Rio Earth Summit in 1992. Since Rio, myriad authors have produced future scenarios based on their belief that sound environmental policies are crucial to humankind's survival. Among these are *Natural Capitalism: Creating the Next Industrial Revolution* (1999) by Paul Hawken, Amory Lovins, and L. Hunter Lovins, and Lester R. Brown's *Eco-Economy: Building an Economy for the Earth* (2001). Pitting the environmental position against the prevailing assumptions of economics, Brown stated that: "[e]conomists see the environment as a subset of the economy. Ecologists, on the other hand, see the economy as a subset of the environment."⁹ The environmentalists provide cogent arguments for change, and consequently have made impressive inroads into the policies and practices of individual nations and civil society organizations. Sustainability, which denotes both environmental and social well being, is also on the international agenda as an integral component of United Nations policy. Lester Brown, in my opinion, is correct in characterizing economics as a subset of the environment, just as Tomás Maldonado defined the human environment as a subsystem within a larger environmental framework. The design community, as a whole, has not adopted sustainability as a core ethos, but many individual designers have. Further development of a sustainability agenda would benefit from attention to the future in two ways: anticipating new materials and processes that could enable more sustainable design, and evaluating the consequences of unsustainable practices.

Forecasting methods received a strong impetus in the 1960s from systems analysis, a mathematical modeling approach to anticipating the behavior of large systems. One of the most effective applications of this approach, which combined systems analysis with historical research, was Herman Kahn and Anthony Wiener's 1967 study, *The Year 2000: A Framework for Speculation on the Next*

9 Lester R. Brown, *Eco-Economy: Building an Economy for the Earth* (New York and London: Norton, 2001), 3.

Thirty-Three Years. Kahn had previously gained worldwide notoriety for his 1961 book of nuclear war scenarios, *On Thermonuclear War*. The Kahn/Wiener study surveyed data from many fields including science, technology, economics, and international politics. More integrative than the geopolitical studies of Kissinger and other international relations experts, *The Year 2000* made connections between science, technology, and politics. It presented some prescient visions of the future, particularly in the realm of technology. Well before anyone could imagine the political consequences of terrorist acts, Kahn and Wiener wrote that “[n]eeds for control and surveillance will develop to utilize (or as Parkinson might say, ‘expand to fill’) the technological capabilities that are present in the system. Technological developments will, in addition to meeting environmental requirements, produce needs to satisfy technological capabilities.”¹⁰

Few forecasting exercises were as extensive as Kahn’s and Wiener’s. A narrower version, technological forecasting, also gained prominence in the 1960s, coinciding with a spike in research on space travel. Like the Kahn and Wiener study, technological forecasting is primarily predictive rather than prescriptive. It is best at characterizing what is likely to happen, and is primarily used by commercial and government organizations that seek to position themselves within an emerging market or research environment. Technological forecasting literature can also be extremely valuable for designers by helping them to locate current practice in relation to future technologies, whose applications they might anticipate with plans, models, and propositions. A broader and more reductive variant of technological forecasting is trend-spotting, exemplified by such widely read books as John Naisbitt’s *Megatrends*, and Alvin Toffler’s *Future Shock* and *The Third Wave*, which were popular predictions of the future as opposed to the more serious literature on geopolitics, the environment, or technology.

Finally, I would like to mention the highly speculative literature produced by technological utopians and dystopians who ponder the future effects of new technologies, frequently on the basis of their own engagement with them. Hence, Hans Moravec, a leading robotics researcher, foresees the day when robots will replace human beings because of their superior intelligence.¹¹ Likewise, Kevin Kelly, a former editor of *Wired* magazine, published a lengthy book in 1994, *Out of Control: The New Biology of Machines*, in which he envisioned a moment in the future as Moravec did, when machines would manage considerable segments of human society. Kelly coined the term “vivisystems” to characterize the relation between groups of natural and artificial entities. As examples of these, he cited “computer virus incubators, robot prototypes, virtual reality worlds, synthetic animated characters, diverse artificial ecologies, and computer models of the whole Earth.”¹² Embracing the incursion of the artificial into the biological, Kelly prognosticated that:

10 Herman Kahn and Anthony J. Wiener, *The Year 2000: A Framework for Speculation on the Next Thirty-Three Years*. Introduction by Daniel Bell. (New York: Macmillan, 1967), 348.

11 Hans Moravec, *Mind Children: The Future of Robot and Human Intelligence* (Cambridge, MA: Harvard University Press, 1988).

12 Kevin Kelly, *Out of Control: The New Biology of Machines* (London: Fourth Estate, 1994).

"[t]he world of the made will soon be like the world of the born: autonomous, adaptable, and creative but, consequently, out of our control."¹³ More recently, the computer scientist Bill Joy, a cofounder of Sun Microsystems, published a cautionary article in *Wired*, "Why the Future Doesn't Need Us," in which he sought to come to terms with the emerging technologies of robotics, genetic engineering, and nanotechnology. As a technological insider, Joy expressed his concern that technology might be moving too rapidly for humans to make appropriate choices about its adoption. "The experiences of the atomic scientists" he wrote, "clearly show the need to take personal responsibility, the danger that things will move too fast, and the way in which a process can take on a life of its own. We can, as they did, create insurmountable problems in almost no time flat. We must do more thinking up front if we are not to be similarly surprised and shocked by the consequences of our inventions."¹⁴ The strongest value of speculative narratives such as Moravec's or Kelly's is their presentation of data in forms that the imagination can grasp. They tend, however, to ignore the complexity of the world, substituting instead reductive predictions that lack sociological, psychological, or political credibility.

Discursive and Practical Power

From the brief survey above, we can see that future scenarios are wildly diverse and rhetorically incompatible. Kevin Kelly, writing about the potential of vivisystems, would seem to be living on a different planet than Lester Brown, who privileges the natural environment as a determinant of human action. And neither is taking into account the reality of the geopolitical world addressed by Fukuyama or Huntington. While Kahn's and Wiener's vision of the year 2000 is more comprehensive than most other studies, its predictive frame is limited by the research agenda of its sponsor, the Hudson Institute, an American think tank that has done most of its work for large corporations and governments.

Envisioning the future is a problematic enterprise, given the cacophony of competing visions that describe how the world could or should be. This puts designers and the design professions in a difficult situation. As mentioned previously, they have a unique ability to give form to plans and propositions, yet they lack broad and coherent social scenarios to guide their work. Although design is implicated in all human activity, there is little in the typical design curriculum that prepares students to imagine such scenarios.

A notable exception to this situation is *Massive Change*, an exhibition about design and the future that opened at the Vancouver Art Gallery in late 2004, and is subsequently traveling to several other venues. Organized by the Institute Without Boundaries, a research group within Toronto designer Bruce Mau's design office, and created along with Mau, the exhibition is prescriptive rather than predictive. Like the writings of Victor Papanek, Buckminster

¹³ Ibid., 5.

¹⁴ Bill Joy, "Why the Future Doesn't Need Us," *Wired* 8:4 (April 2000): 262.

Fuller, Gui Bonsiepe, and Tomás Maldonado before it, *Massive Change* is a discursive project even though it takes the form of an exhibition, catalogue, and Website, rather than a book. As the introductory catalogue text claims, *Massive Change* “shifted the objective of the welfare of the human race from a utopian ambition—one that is, by definition, out of reach and will remain in the realm of art—to a design project, a practical objective.”¹⁵

Divided into categories called “economies,” the exhibition and catalogue offer a wealth of new ideas in fields ranging from urbanism and energy to new materials, manufacturing, and warfare. The organization and content of the exhibition was largely inspired by an array of experts who were called in as consultants during its planning. Throughout the pages of the catalogue run interviews with the likes of William McDonough, Hernando de Soto, Dean Kamen, Lawrence Lessig, Stewart Brand, Hazel Henderson, Arthur Kroker, Catherine Gray, and Jeffrey Sachs.

Politically, *Massive Change* presents a liberal, global agenda. It emphasizes the most positive side of capitalism—its ability to innovate in a socially-responsible way—while identifying the multifarious actors in civil society—“[c]itizen groups, social entrepreneurs, nongovernmental organizations (NGOs), and nonprofit associations”—as its preferred agents of change. It does not address geopolitics or its influence on design. Nor does it deal with technologies that have the most dystopian potential. Not without its critics who raise legitimate concerns about its limitations, its spirit is to open new avenues for designerly engagement rather than to analyze or critique the current practices of design.¹⁶ Relying heavily on experts in diverse fields, *Massive Change* is about action rather than policy, and is effective in providing an avenue of hope for designers who are concerned about the state of the world.

As a practical, rather than discursive, example of how designers can gain more autonomy, we can mention Curitiba, Brazil, where Jaime Lerner, who was elected mayor three times beginning in 1971, transformed the city into a low-tech laboratory for sustainable urbanism. Trained as an architect and planner, Lerner was assisted by a large group of architects and designers who worked in a city-run urban institute. Together, they identified and carried out hundreds of projects ranging from a BRT system that made bus transport more efficient, to a factory that produced toys from recycled plastic as well as pedestrian plazas and Braille street signs that were attached to posts at street intersections.¹⁷

Both *Massive Change* and Jaime Lerner’s achievements in Curitiba are examples of how designers can gain discursive and practical power, but each example has its limitations. *Massive Change* fails to confront the many ways that designers are implicated in producing a world that runs counter to the values the exhibition espouses, nor does it suggest the kinds of political changes

15 Bruce Mau and the Institute Without Boundaries, *Massive Change* (London; Phaidon, 2004), 19.

16 For a trenchant critique of the *Massive Change* project, see David Stairs, “Bruce Mau and the Apotheosis of Data,” on Stairs’s Website “Design – Altruism – Project”: www.design-altruism-project.org/?p=22.

17 Curitiba came to international attention at the time of the Rio summit in 1992. See the section on Curitiba in Paul Hawken, Amory Lovins, and L. Hunter Lovins, *Natural Capitalism: Creating the Next Industrial Revolution* (New York and Boston: Little, Brown and Co., 1999), 288–308.

that must occur in order for designers to undertake the good work it advocates. Lerner's leadership in Curitiba demonstrates that a designer—whether an architect, planner, or product designer—can accomplish a lot in a position of power. But it remains an idiosyncratic example that could only be replicated with great difficulty in countries with different political cultures.

Thus, we return to Maldonado's argument that designers have to seek autonomy and use it, if possible, for socially and environmentally productive ends. They must confront a world that is becoming increasingly polarized: wealth versus poverty; fundamentalist religion versus secular humanism; environmental sustainability versus ecological destruction; and technological utopianism versus technological resistance. To position one's self among these and other oppositional forces requires an intensive reflection on one's own values, goals, and social concerns. It also calls for an operational strategy to align one's self with other social actors and institutions, whose concerns are compatible with one's own.

How then can scenarios of the future help? Herman Kahn and Anthony Wiener believe that anticipating future events is an attempt to "make the desirable more likely and the undesirable less likely."¹⁸ They note that: "[t]rends or events that depend on large, aggregative phenomena are often more amenable to long-range planning than those that depend on unique circumstances or special sequences of events."¹⁹ Kahn and Wiener directed their observations to their government, corporate, and military clients, and it is precisely because of their forecasts and those by related researchers that these clients tend to be in the strongest position to understand the trends of the future and shape their own courses of action accordingly.

Future Scenarios, Ethics, and Values

Societies do not develop along linear trajectories. Intense activity in one or more fields such as science, technology, warfare, or the arts can produce sea changes that result in radically different situations that are difficult to foresee. The world is now in the midst of such a sea change, and we must learn to think in a new way about the future. American law professor Jeffrey Rosen made this argument some months ago as he reflected on the confirmation hearings for United States Supreme Court justices. Presuming that the questioning in any confirmation hearing would focus on the justices' past records and opinions on current controversial issues such as abortion, Rosen advocated the importance of making the confirmation process as much about the future as the present or past. He pointed out that, within the next decade, "the Supreme Court will, in all likelihood, be asked to decide a fascinating array of divisive issues that are now only dimly on the horizon."²⁰ As examples, he cited such controversial topics as electronic surveillance, brain fingerprinting, genetic screening, reproductive cloning, data mining, and

18 Kahn and Wiener, *The Year 2000*, 3.

19 Ibid., 2.

20 Jeffrey Rosen, "The Future Is Not the Present," *The New York Times Magazine* (August 28, 2005), n.p. The article can be downloaded from: www.nytimes.com.

digital property rights. His point was that it would be as important to know how the nominees might vote on these issues, as it would be to examine how they had voted on cases in the past.

Like the Supreme Court justices to whom Rosen referred, designers too will be facing situations that raise unprecedented issues of values and ethics. New technologies are now radically transforming our relation to the material world and to each other. Engineers, code writers, product designers, and scientists are at the center of these transformations. I am not convinced that they are able to foresee all the possible uses to which their new devices will be put, which means that the “dark side” of certain technologies may become social realities.

Numerous technologies are already in place, simply awaiting commercial implementation. RFID chips, for example, eventually will be implanted in most products so that stores can keep track of their inventories. But once the products are purchased, the chips will continue to transmit signals. Current consequences appear benign. Science fiction author Bruce Sterling sings the praise of chipped products, which he sees as belonging to an “Internet of Things.” “The primary advantage of an Internet of Things,” he writes, “is that I no longer inventory my possessions inside my own head. They’re inventoried through an automagical inventory voodoo, work done far beneath my notice by a host of machines. I no longer bother to remember where I put things. Or where I found them or how much they cost. And so forth. I just ask. Then I am told with instant real-time accuracy.”²¹ And yet the amount of data that objects will emit and its potential for public access raises myriad privacy issues that Sterling sidestepped in his glowing vision of RFID tags as electronic servants, keeping track of all our possessions.

Besides their insertion in products, RFID chips are also being touted for implantation in human beings and are, in fact, already being used by some young people in Europe as the equivalent of credit cards, notably in bars and night clubs. The VeriChip Corporation, which owns the patent on the implantable chip, is presently promoting its use for multiple purposes ranging from medical surveillance to homeland security.²² Many in the commercial world, as well as a vanguard of artists who for years have toyed with the concept of a post-human cyborg, are enthusiastic about RFID technology. But RFIDs also open the door to far more serious issues of personal privacy and control of one’s body. Designers are involved in every aspect of the RFID’s design, promotion, and use. Engineers invented the chips, Web designers created the VeriChip Website, and product designers fashioned the chip reader and other related paraphernalia.

Moving from the microcosmic to the macrocosmic, a small but active community of entrepreneurs is interested in the colonization of space and the commercialization of its resources, whether as raw materials or real estate. Space Adventures Ltd. is heralding the dawn

21 Bruce Sterling, *Shaping Things* (London: MIT Press, 2005), 93.

22 Explanations about the RFID chip and its potential applications can be found on the Website of the VeriChip Corporation: www.verichip.com.

of space tourism and a number of businessmen including Richard Branson, who formed Virgin Galactic, have founded companies to manufacture vehicles for tourist travel. Beyond space tourism itself, some of the entrepreneurs in this new field have also set their sights on the commercial potential of outer space.

Their ambition ignores the propositions in several United Nations treaties—the Outer Space Treaty of 1967 and the Moon Treaty of 1979—which state explicitly that the resources of outer space are the heritage of all mankind. Although the treaties forbid ownership of resources that might be found on the moon or other celestial bodies, they have few signatories and their enforcement is hard to imagine. We have yet to see whether entrepreneurs interested in outer space will honor the spirit of those treaties, or whether they will ignore them and begin to market the resources they discover. If they do move ahead with commercial ventures, they will need hosts of designers to create their space craft, harvesting equipment, dwellings, and publicity. This raises questions about the ethics of working for a client whose project goes against the wise council of an unenforceable treaty.

The two situations I have described are only a sampling of those that designers will be facing in the years to come. How will they be prepared to evaluate these situations? In societies whose economies are intertwined with advanced technologies, new inventions and systems such as RFID chips and Smart Dust, the tiny micro-sensors that can transmit data from one to the other while remaining virtually invisible, have the potential to alter the very core of social life. As the professionals who are creating these devices, designers should be generating a strong dialogue about their social implications as Bill Joy did in his previously cited *Wired* article.

Historically, the task of the designer was simpler than it is today, and the designer's responsibility was easier to define. Providing decoration for or giving form to products was the primary task. Consequently, design discourse was about visual form and, subsequently, about mechanical function. John Ruskin and William Morris expressed concerns related to labor and quality, but they were not preoccupied with the uses of products which, in the late nineteenth century, did not have the social consequences they do today. Now faced with the growing complexity of the product milieu, designers have to think more profoundly about the future and their role in making it into the present. They need early warning systems to alert them to social trends that might have a bearing on what they design, and they require the intellectual tools to reflect on the meaning of these trends and their ethical implications.

But ethics, like technology, has also entered a gray area where the moral implications of certain actions are unclear. Research done in selected fields such as bioethics has produced a significant literature on cloning, stem cells, and related topics. But the ethics of chip implants, technological surveillance, or the commercialization of

outer space are yet to be debated with any degree of seriousness. We need to reconfigure the ethical discussions, however modest, that have historically been part of design discourse. At the core of a new design ethics is the question of what it means to be human. Clive Dilnot has argued that we are immersed in a world of artifice, which has subsumed any relation to a realm of nature. I take issue with Dilnot and prefer to situate the human environment, as Tomás Maldonado does, within a larger system that transcends the limits of human production.²³ Maldonado notes that the human agency is capable of damaging or destroying the larger system, but that the human environment is no more than a subsystem of the ecological one. The implication of his schema is that the conduct of human life is in some way accountable to the complex order of the larger ecological system. While modeling the organization of the human environment on the biosphere is problematic, as numerous scholars have shown, nevertheless there is much that humans have to learn about coexisting with nature.

Nature is only one source of values. Religion is another, as is philosophy. Those who embrace the ethical credos of religion do so because they believe religious values represent the will of a higher power. Philosophical values are sustained within specific cultural systems for another reason—they appear reasonable. Collective value systems, such as those embodied in an aggregate of United Nations declarations, derive from these prior bodies of religious and philosophic thought. All these codes and compendia are sources to draw upon in fashioning a new ethics for the future.

The future we are facing deeply implicates designers who work across many different professional fields. They are, in effect, the agents whose skills produce the milieu of products and services in which we live. To the degree that this milieu does not enhance and affirm human potential and well-being, we must hold designers at least partially accountable. We need to foreground the question of how to create an ethics of designing that can suggest humanly satisfying directions for future work. This is a collective task for the design community whose grasp of the future will continue to determine how we live in the present.

23 See Victor Margolin, "The Liberation of Ethics" in Clive Dilnot, *Ethics? Design?* [Archeworks Papers 1 no. 2] (Chicago: Archeworks, 2005), 160.