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Rethinking Design Education for the 21st Century: Theoretical, Methodological, and Ethical Discussion

Alain Findeli

A New Worldview?

Even the most cursory look at recent literature and production in design would be sufficient to reach the conclusion that the general landscape is safe, quiet, and serene. It is, therefore, not really original to claim that we are in a period of necessary change, be it in design education, practice, or research. Although the reasons invoked in support of this diagnosis may vary considerably, they generally are considered to reside within the field of design itself. For instance, Hugues Boekraad and Joost Smiers mention "the disturbing effect of product engineering and marketing on design and the visual arts" as the main issue to be addressed currently.[1] This problem is, without doubt, a central concern today, but it can be considered as a symptom of a wider issue to which all other professions also are confronted: engineering, medicine, education, social work, law, etc., as if in its very foundations, contemporary practical philosophy were in crisis. In other words, one is bound to conclude that the reasons for the current situation in design are to be found mainly outside of the field of design. This explains the very wide—and, to some extend quite ambitious and pretentious—scope of this essay.

I do not think it necessary to dwell too long on the diagnosis of our current situation. Let me just say that I tend to agree with the idea that we are in a paradigm shift, although I don't necessary share all the analyses and reports which have been made on this quite controversial topic. Our current paradigm; by that I mean the shared beliefs according to which our educational, political, technological, scientific, legal, and social systems function without these beliefs ever being questioned, or discussed, or even explicitated, this paradigm may be—and indeed has been—characterized in various ways. For my part, I retain the following main characteristics: its materialistic underlying metaphysics; its positivistic methods of inquiry; and its agnosticist, dualistic worldview.

There is no reason why the disciplines of design would escape the influence of this general framework. Indeed, all the drifts one is witnessing today in design can be attributed to one or all of

1 H. Boekraad and J. Smiers, "The new academy," *European Journal of Arts Education* II: 1 (Nov. '98): 60-65. This text actually is a manifesto calling for the foundation of a "new academy" of arts and design. The manifesto was launched as a working paper at the European League of Institutes of the Arts (ELIA) conference in Lisbon (November 16, 1996) under the full title of "The New Academy. Uniting Visual Intelligence With Ethics and Research." A symposium was organized thereafter in Barcelona in October 1997, where thirteen design scholars and practitioners from seven different countries were invited to contribute to this debate, the conclusions of which were made public at the 1998 ELIA conference in Helsinki by Hugues Boekraad and Alain Findeli. A collection of the most important elements of the New Academy Project currently is being edited by Joost Smiers and Hugues Boekraad, and is scheduled for publication soon. This essay is a reworked and enlarged version of the working paper presented in Barcelona, on which the lecture I delivered in Edmonton on November 12, 1997 was based.

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these three central pillars: the already mentioned "effect of product engineering and marketing on design," i.e., the determinism of instrumental reason, and central role of the economic factor as the almost exclusive evaluation criterion; an extremely narrow philosophical anthropology[2] which leads one to consider the user as a mere customer or, at best, as a human being framed by ergonomics and cognitive psychology; an outdated implicit epistemology of design practice and intelligence, inherited from the nineteenth century; an overemphasis upon the material product; an aesthetics based almost exclusively on material shapes and qualities; a code of ethics originating in a culture of business contracts and agreements; a cosmology restricted to the marketplace; a sense of history conditioned by the concept of material progress; and a sense of time limited to the cycles of fashion and technological innovations or obsolescence. All these aspects have contributed to the current state of design, but nevertheless should be considered as necessary steps in its historical development; as such, it is much too easy to condemn them today, as if they could have been avoided. However, there is no reason to resign ourselves to them any longer.

In this perspective, I will try to contribute to the following three problems: (1) What theoretical model of design could be used as a basis for education? (2) What is an appropriate epistemology of design practice and its import on design methodology? and (3) How can the issue of ethics in design be problematized? Needless to add, the following propositions are to be considered as an endeavor to lay down new foundations[3] for design education and research within a non-materialistic, non-positivistic, and non-agnosticist, non-dualistic worldview.

Updating the Bauhaus Heritage: A Model for Design

One of the most famous slogans for which the Bauhaus is renowned is Gropius's catch phrase used for the 1923 international exhibition held in Weimar: "Art and Technology: A New Unity." This is the theoretical model in which the philosophy of the Bauhaus was grounded. The distinction between *Formlehre* and *Werklehre* in the curriculum is the most visible embodiment of this model. Yet this is not what was originally planned in the 1919 program which Gropius had included in the famous leaflet containing the Feininger woodcut of the cathedral illustrating the founding manifesto. The program read as follows:

> Instruction at the Bauhaus includes all practical and scientific areas of creative work […] Students are trained in a craft (1), as well as in drawing and painting (2), and science and theory (3).[4]

As can be seen, instead of the polar art / technology structure, a threefold technology / art / science structure originally was planned to support the curriculum. In Dessau, a new curriculum had been

2 The task of philosophical anthropology is to deliver a "theory" of the human being in general. It is, therefore, not to be mistaken for the anthropology of our academic "Departments of Anthropology." All major philosophers have devoted a part of their work to anthropological issues, either explicitly or implicitly. The design disciplines and, for that matter all professional disciplines, adopt a—usually implicit—anthropology when dealing with their "client," "patient," "customer," "user," "beneficiary," "addressee," etc. An explicit and systematic discussion of anthropological issues remarkably is absent from design curricula. For a comprehensive overview, see B. Groethuysen, *Anthropologie philosophique* (Paris: Gallimard, 1980, 1953).

3 In a paper read at the 1999 International Conference on Design Research of the UIAH (Helsinki), Wolfgang Jonas declared the use of the term "foundation," irrelevant pretending that "there are no (and will never be) 'foundations' that could serve for building a stable and consistent theory in the scientific sense on them." He is right if "foundation" is meant in a very classical, eighteenth/nineteenth century philosophical and epistemological sense. However, in a constructivist (or constructionist) framework, which is the approach adopted here as will be stated later, "foundation" has the meaning of "starting point," of a kind of consensus around some key issues, without which any further discussion would be impossible or meaningless. My attitude in this paper is not apodictic, but rather propositional.

4 Quoted in H.M. Wingler, *The Bauhaus* (Cambridge: MIT Press, 1979), 44.

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printed, which mentioned as "areas of instruction" the following: "(1) practical instruction; (2) form instruction (practical and theoretical); and supplementary areas of instruction.[5] Here again, the original threefold structure transformed itself into a polarity, in this case practice / theory.

When Moholy-Nagy founded the New Bauhaus in 1937 in Chicago, he wished to remain faithful to the original philosophy. However, some changes were introduced both in the structure and the content of the curriculum. For the structure, he relied heavily on the philosopher Charles Morris, one of the main representatives of the Vienna Circle in the U.S., and coeditor of the *Encyclopedia of Unified Science* which can be considered as the "bible" of logical positivism. Morris, who was, at that time, working on his general theory of signs or semiotics, taught a course in "intellectual integration" at the New Bauhaus, in which he attempted to articulate what he believed to be the three main dimensions of design: art, science, and technology. In short, Morris considered the design act to be a kind of semiosis, and he drew a parallel between the syntactic, the semantic, and the pragmatic dimensions of a sign and, respectively, the artistic, the scientific, and the technological dimensions of design.[6] For various reasons, this ambitious and highly original philosophical project never was satisfactorily achieved.

The Hochschule für Gestaltung (HfG), opened at Ulm in the early '50s, explicitly claimed the heritage of the Bauhaus. After a while however, this historical reference appeared somewhat cumbersome to its directors. In 1958, Tomás Maldonado already had declared that "these ideas [had] now [to] be refuted with the greatest vehemence, as well as with the greatest objectivity." "A new educational philosophy," he proclaimed, "is already in preparation; its foundation is scientific operationalism."[7] As a consequence, the artistic dimension of the original curriculum became less and less important, whereas its scientific content was increased and emphasized, especially with contributions from the human and social sciences. "Science and technology; a new unity" could well have been the new slogan at Ulm. The idea that design was **applied esthetics** had been replaced by a new theoretical model, considering design as **applied (human and social) science**, but the underlying dualistic epistemological structure remained the same in Weimar / Dessau and in Ulm.

After this more than hasty overview of the evolution of the Bauhaus lineage, one can draw the following conclusion. It seems that the optimal, archetypal, structure of a design curriculum within the Bauhaus tradition would be a threefold articulation of art, science, and technology (fig. 1). The three examples I briefly described could be pictured as in fig. 2, where we can see that none of them managed to actualize the ideal model. The problem lies both in the relative weight of the three dimensions, and in their adequate articulation.

5 Ibid., 109.

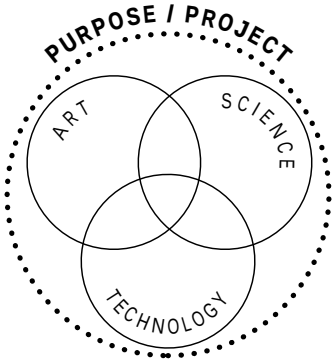
6 C. Morris, "The Intellectual Program of the New Bauhaus" (typescript), University of Illinois at Chicago Special Collection, 5 pages, 1937; and "Science, Art, and Technology," *Kenyon Review* I (1939): 409–423.

7 T. Maldonado, "Neue Entwicklungen in der Industrie und die Ausbildung des Produktgestalters" *Ulm* 2 (Oct. 58): 25–40 (also in English and French); see also "Ist das Bauhaus aktuell?" *Ulm* 8/9 (Sept. '63): 5–3, and Walter Gropius's reply in *Ulm* 10/11 (May '64): 62–70. (Also in English.)

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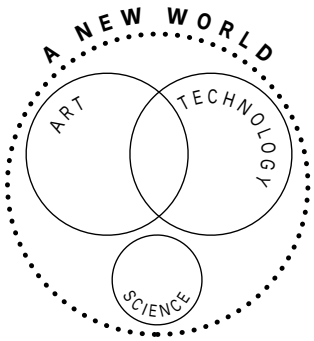
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Figure 1
Archetype (UrmodelI) of Design Curriculum

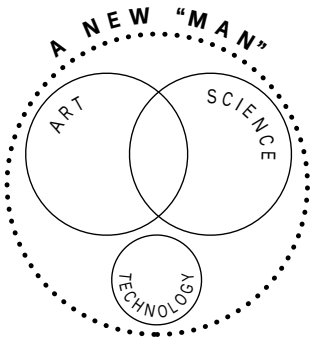


Today, everybody tends to agree upon the necessity of including art, science, and technology in a design curriculum. But disagreement will soon arise, on the one hand, as to their relative importance, and, on the other hand, as to their respective function, i.e., the way they should be articulated. A third and highly critical aspect inevitably will provoke even stronger disagreement, a factor without which no curriculum, be it as filled with theoretical courses, workshops, seminars, and studio work as possible, will ever find its coherence: the overall purpose of design education and practice. This is what is indicated in figs. 1 and 2 by the large circle of dotted lines. The questions to be asked are: To which meta-project (anthropological, social, cosmological, etc.) does a design project and a design curriculum contribute? For what end is design a means? Can design find its *raison d'être* within its own field and remain autarchical? How autonomous can design be? All these questions are related to the ethical dimension of design, which will be discussed later.

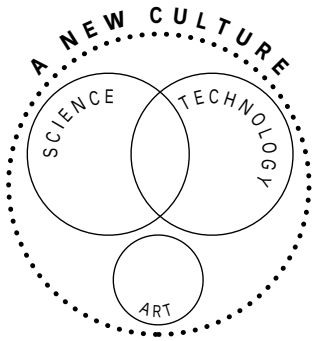
Figure 2
Three Historical Embodiments of the Archetype of Figure 1



BAUHAUS
Gropius
1919–1928
Weimar, Dessau



NEW BAUHAUS
School of Design
Institute of Design
Molholy-Nagy, Chermayeff
1937–1955
Chicago



HOCHSCHULE
Für GESTALTUNG
Maldonado, Aicher, Ohl, Rittel, etc.
1958–1968
Ulm

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Epistemological and Methodological Dead Ends

From "Applied" to "Involved" Science

An inquiry into the historical development of design theory reveals that the discipline has adopted two major paradigms to account for the logics (or epistemology) of design thinking: **applied art** and **applied science**. Both take their roots in the nineteenth century, and must be considered as outdated today.

Applied art is the very first model under which design operated, according to the long tradition of the decorative arts, sometimes renamed industrial arts. The word "applied" refers to the utilitarian side of the artifacts, the other side being the artistic. "Disciplined arts" is another variant, coined by Goethe. At the Bauhaus, this model was slightly modified, insofar as the artistic component began taking a scientific coloration, for instance in Kandinsky's and Klee's "theoretical" courses. Influenced by nineteenth-century scientism, design was considered at the Bauhaus as artistic or esthetic theory applied to practice. In other words, students were expected to apply in the *Werklehre* what they had learned in the *Formlehre*.

Applied science follows the same structure: instead of art, science now is playing the role of referent, i.e. of "fundamental discipline" to be applied into practice. An implicit deductive link is established in this model between theory (science) and practice (technology). The underlying theoretical model of design at the HfG was the following: design tended to be considered as applied science, mainly human and social science. In other words, the design project was to be deducted from the knowledge gathered in the theoretical courses.

As a result, one often hears, in design schools, that, if the problem is well stated (i.e., if the preliminary scientific inquiry has been thoroughly conducted and the functional criteria precisely established), the solution will follow almost **automatically**. The most widely-accepted (and practiced) logical structure of the design process is, therefore, the following:

1 A need, or problem, is identified: situation A;
2 a final goal, or solution, is imagined and described: situation B; and
3 The act of design is the **causal link** by which situation A is transformed into situation B.

Only recently has the idea that technology is nothing but applied science been challenged by historians and philosophers. Contemporary models accept the fact that the history of technology has followed a path relatively independent from scientific development. These models all claim an autonomous epistemology for technology.[8] Furthermore, by separating human knowledge into two main sectors, the "sciences of the natural" and the "sciences of the artifi-

8 One of the most convincing arguments against the applied science epistemology in the field of design is Donald Schön's introductory chapter to his *Educating the Reflective Practitioner* (San Francisco: Jossey Bass, 1987)

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cial," Herbert Simon has clearly claimed the originality of design thinking.[9] Systems and complexity theories have further contributed to a radical transformation of the mechanistic model of the design process[10] The main consequence is the introduction of teleology into an otherwise strictly causal sequence. As such, the concept of **project** gains a much stronger theoretical status. Instead of "applied" science, I propose to speak of "involved," "situated," or "embedded" science. Such a model considers that the scientific inquiry and attitude are **carried into** (instead of applied to) the field of the project and of practice, so that the former are modified by the latter, and vice versa. Donald Schön's concept of "reflection-in-action" thus is transferred from its mainly methodological to the epistemological realm. Better said, the distinction between the methodological and epistemological realms no longer is necessary or even relevant.

A new logical structure of the design process is:

1 Instead of a problem, we have: state A of a system;
2 Instead of a solution, we have: state B of the system; and
3 The designer and the user are part of the system (stakeholders).

The designer's task is to understand the dynamic morphology of the system, its "intelligence." One cannot act **upon** a system, only **within** a system; one cannot act against the "intelligence" of a system, only encourage or discourage a system to keep going its own way; state B of the system is, among various possibilities, the one favored by the designer and the client according to their general set of values; state B is only a transitory, more or less stable, state within a dynamic process, never a solution; the production of a material object is not the only way to transform state A into state B; and since the designer and the user also are involved in the process, they end up being transformed, too, and this learning dimension should be considered as pertaining to the project.

Visual Intelligence and Complexity Theory [11]

In an article published in 1947, Walter Gropius asked: "Is there a science of design?" [12] Although he maintained the irreducibility of the creative aspect of design, nevertheless he proposed to ground the design process into an "objective" scientific context, namely the psychology of visual perception, and thus emphasizing visual intelligence. The problem with such a proposition, as the later development of design has amply demonstrated, is the importance put upon the visual appearance of the material object. On his part, Moholy-Nagy seems to have been more aware of what we now would call the complexity of the design process and project. According to him, "the key to our age [is to be able] to *see everything in relationship*." [13] Whereas an object has a visible presence, relation-

9 H. Simon, *The Sciences of the Artificial* (Cambridge: MIT Press, 1996, 3rd enlarged edition).

10 Jean-Louis LeMoigne, the French translator of Herbert Simon's seminal work cited above, has been very active in trying to provide the most sound, comprehensive, systematic, and critical epistemological basis for all professional disciplines. With his collaborators of the AEMCX (European Association for the Modeling of Complexity), he has been publishing the triannual *Lettre MCX* (MCX Newsletter) since 1988, and organized many transdisciplinary and interprofessional conferences, the themes of which steadily revolved around the central issue of theory/practice relationships. Their Website, <mcxapc.org>, is worth consulting regularly.

11 I follow Boekraad's and Smiers's "The New Academy," in which the issue of "visual intelligence" is raised.

12. W. Gropius, "Is There a Science of Design?" *Magazine of Art* 40 (Dec. 47) reprinted in *Scope of Total Architecture* (New York: Collier Books, 1962), 30–43. (First ed. 1954.)

13 L. Moholy-Nagy, "Why Bauhaus Education?" *Shelter* (March 1938): 7–22 (emphases in original).

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ships are, by essence, invisible. Therefore, the kind of visual intelligence needed in such a case is of a different quality.

If we accept the epistemology and methodology described above for the design process, it is easy to understand why a different kind of visual intelligence—similar to the one intuited by Moholy-Nagy—will be required from the designer and, therefore, taught to the students. Future visual intelligence is bound to depart from its traditional connection with the material world and its artifacts, otherwise, as Goethe wrote in 1817, "One faces the danger of seeing and yet of not seeing." Everybody remembers Oskar Schlemmer's diagram showing a running human surrounded by a complex, multidimensional cosmos. Such an image must be considered as the basis for future visual intelligence in design, since any design project evolves between the two poles of anthropology and cosmology. The underlying anthropology of design usually is reduced to anthropometrics, ergonomics, and consumer psychology and sociology. But a user is more than the statistical "being of needs and desires" of the designer. Likewise, the designer him / herself is more than a rational computer, as depicted by contemporary cognitive psychology and as produced by design education. A contemporary anthropology will have to take into account the complex interplay and relationships of the various layers and subsystems which build up the inner world of the thinking, feeling, and willing human being. Conversely, the outer world is much more than what even environmentalists and ecodesigners call the environment, usually reduced to its biophysical aspects. Here, we also are dealing with various interrelating subsystems, which function and evolve according to very different logics: the technical or man-made world, the biophysical world, the social world, and the symbolic world or "semiocosm." These inner and outer worlds interact with each other.[14] As a consequence, before any project can be launched within such a complex situation, a designer indeed must make sure he / she has an adequate representation of the content, the structure, the evolutionary dynamics, and the trends or "telos" of such a system. This is why future visual intelligence must be capable of penetrating into the invisible world of human consciousness (thoughts, motivations, purpose, fear, needs, aspirations, etc.) and into the intricate ecologies of the outer world.

The potential of complex systems theory for design has been identified by some authors within the last decade.[15] Emphasis has been put mainly on the complexification of the models describing the design process, and on the semiotic complexification of the perception and reception of the products of design. All of these endeavors tend to remain within the domain of design, however. My suggestion is that we should not restrict ourselves thus, but, instead, open up the scope of inquiry, i.e., in systems theory terms, and push back the boundaries of our system in order to include other important aspects of the world in which design is practiced.

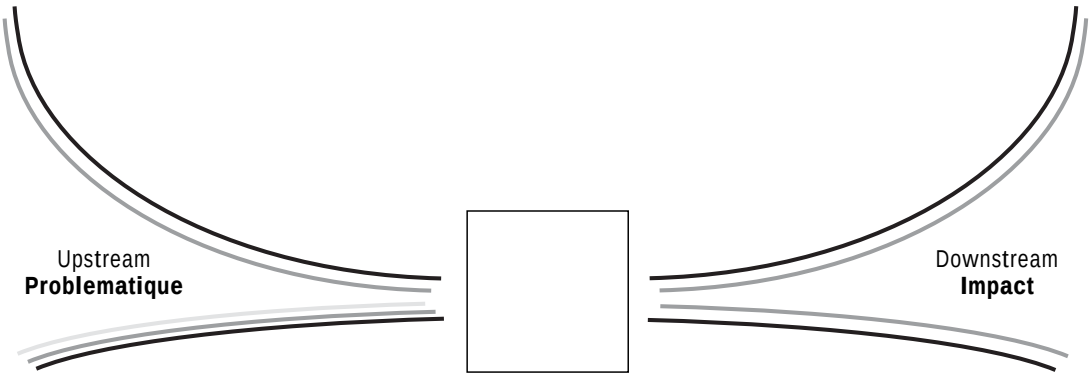
14 I have presented my own interpretation of this systemic model in "Ethics, Aesthetics, and Design. Educational Issues" *Design Issues* 10:2 (Summer 94): 49–68.

15 Wolfgang Jonas in Germany and Harold Nelson's "Whole Systems Design" program in the U.S. are two important names in this respect.

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Figure 3
The necessary upstream (problématique) and downstream (impact) complexification of the design project.



Let us discuss this with Hickling's model.[16] The input "PROBLEM" and the output "ACTION" of the design process are considered as not being part of the design process. The "problem" is a given, and usually is considered as such in design practice and in the design studio of our schools. An "action" comes out of the process, ready to live a life of its own, in another realm. But, in reality, problem and action dwell in the same world, of which the designer also is part, not only as a professional, but also as a citizen. It is not my intention to discredit the efforts to complexify the internal components of the system of design, i.e., to yield an even more complex and sophisticated model of the design process and of the design product. But if we are interested—and designers should be interested—in the origin and the destination of their projects, then the complexification of the **process** and the **product** should be completed, on one hand, by the complexification of the ***problématique***[17] (or problem-setting), and, on the other, by the complexification of the **impact** of the project (fig. 3).

How will this intelligence of the invisible be taught? I do not consider the mathematical or formalistic approach to systems science relevant for such a task, due to its manipulative, "objective" nature. A system, and especially a human or social system, is best understood from within, through a qualitative, phenomenological, approach.[18] **Basic design**, if properly reconsidered, will be the best pedagogical tool for teaching such an approach. Insofar as a system is something like a complex living morphology, I believe that aesthetic education will be the best way to apprehend its dynamics. Furthermore, the appreciation of the relative stability of a system, and of the instability induced by the action of a designer within a system also are the concern of aesthetics. As a matter of fact, I think

16 Hickling, "Beyond a Linear Iterative Process?", in B. Evans, et al., *Changing Design* (Chichester: John Wiley & Sons, 1982), 275–93.

17 The French word *problématique* is an important concept of Foucault's archeology. In design, it is the result of the complexification of a mere product-centered problem in terms of social, economic, symbolic, political, etc. issues.

18 This specific methodological question is discussed in the second half of my former essay, "A Quest for Credibility: Doctoral Education and Research at the University of Montreal," in R. Buchanan, et al., "Doctoral Education in Design, Proceedings of the Ohio Conference," Pittsburgh, PA, Carnegie Mellon University, 1999.

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that Moholy-Nagy had sensed this issue when he designed his preliminary course in Chicago. Didn't he claim that this course was perfectly fitted for any professional curriculum, i.e., not only for designers, but also for lawyers, doctors, teachers, etc.? Furthermore, as we shall see shortly, such a basic design education will not only have an effect upon the designer's intelligence of complex systems (gnoseological aspect), but also upon the designer's professional responsibility when dealing with systems (ethical aspect).

Design Ethics and the Purpose of the Design Project

At the School of Design of the University of Montreal, we carried out a research project on the issue of design ethics and the responsibility of the designer (1989–92). This project, named "Prometheus Enlightened," was launched after observing that our professional code of ethics no longer was adapted to the contemporary conditions, and that a new code had become necessary. Our main conclusions were the following:

1 In order to be able to define professional responsibility (i.e., not only competence), a discussion on the **purpose** of design is necessary.
2 Priority should be given to the reform of design **education**.
3 There can be no responsible design without a responsible designer, i.e. education should be directed to the development of an **individualistic ethics**.[19]

Unless the third point, in particular, is considered, any general discussion about ethics, morals, ethical theory, deontic/utilitarist ethics, etc., becomes almost meaningless. This is why this section will be very short.

The general purpose of design has evolved within the Bauhaus lineage. Fig. 2 indicates the major themes within the three periods I have considered: "A new world," "A new 'man,'" and "A new culture." Notice that, in each case, this was considered as a goal to be attained with a technicist view, i.e., according to the modernist logical structure of the design process described above. In other words, somehow it was believed that if the necessary means, tools, actions, and decisions were put together, these goals could be attained. In the new perspective, however, the purpose of design must be considered as a horizon, as a guiding set of values, and as an axiological landscape to which one always must refer when taking a decision or evaluating a proposition within the design project, and not as an ideal goal to be reached in the more or less near future.

What could be an adequate purpose for the coming generations? Obviously, the environmental issue should be a central concern. But the current emphasis on the degradation of our biophysical environment tends to push another degradation into the background, that of the social and cultural (symbolic) environments,

19 A. Findeli, *Prométhée éclairé. Éthique, technique et responsabilité professionnelle en design* (Montréal, Éd: Informel, 1993).

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i.e., of the human condition. Consequently, I suggest that design could not only contribute to a sustainable natural world, but would adopt as a purpose something such as: "A balanced humankind in a balanced world," therefore stressing anthropology and cosmology as the two polar complementaries around which the content of a design curriculum could be built up.

The epistemological / methodological shift suggested above has another important consequence on design responsibility. In effect, the systemic view implies that the making of an artifact, which usually is considered as the normal outcome of a design project, is no longer taken for granted. Within these complex systems, designers are expected to **act** rather than to **make.** In other words, making (poiesis) must be considered only a special case of acting (praxis), to the extent that even "not making" is still "acting." In philosophical terms, one would say that design pertains to practical, not to instrumental, reason; or else that the frame of the design project is ethics, not technology. In existentialist terms, this could sound as follows: design responsibility means that designers always should be conscious of the fact that, each time they engage themselves in a design project, they somehow recreate the world.

As to the question of individualistic ethics, the matter is almost too simple: some kind of moral education must be included in the design curriculum, so that the moral consciousness of every student is increased.[20]

The Vanishing Product

The issue of the dematerialization of our world has become a recurring leitmotiv in design, especially since the Centre Georges-Pompidou exhibition *Les Immatériaux* in 1985.[21] The logical outcomes of the above propositions also will point to the same end result, i.e., the vanishing of the product as the main target of design. The following four scenarios describe the way in which the product-centered attitude could be replaced by a new one if design is to survive and evolve according to the conditions of the new paradigm:

1 The shift toward a systems approach and complexification, i.e., from a "problem and solution" to a "state 1 and state 2 of the system" situation, pushes material artifacts to the background in favor of the actors within the system. This, in turn, yields to the end of the "product as work of art" paradigm in design, and of the design act as a heroic gesture; in short, the end of the fetishism of the artifact.

2 The systematic questioning of the design brief (the complexification of the problem into *problématique*) will invite designers to look for the "dark side" of the object. They become more interested in the human context yielding

20 This is, of course, a very sensitive issue not only in design, but in general education. As already suggested, I believe a well-thought basic design curriculum could be a good place for this. Our research tends to show that esthetic and moral dilemmas or decisions are structurally congruent. Therefore, esthetic education could contribute to moral literacy.

21 See also *Design Issues* special double issue "Designing the Immaterial Society," 4:1 and 2, 1988.
The kind of basic design exercises and assignments that would fulfill the task described here would be similar in principle to the one discussed in P. Hadot, *Philosophy as a Way of Life* (Oxford: Blackwell, 1999). Hadot opportunely reminds us that, in order to be adequately assimilated and understood, philosophy must be studied experientially, not intellectually as is the case today.

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the brief than in the classical "product description" brief generally used in design and engineering.

3 We still live with a picture of design handed down by the nineteenth century, when the concept of this profession first appeared. Design was summoned to absorb the shock of industrialization, and to soften its devastating consequences upon the cultural web, in other words, to make industrialized products culturally—socially, economically, symbolically, and practically—acceptable. Aesthetics was then its privileged rhetorical tool, followed by ergonomics in the mid-twentieth century, and semiotics (i.e., aesthetics again) in the late-twentieth century. But its almost unique field of activity has remained the material product; manufactured by mechanical, electrical, and/or electronic industries. Our century has witnessed an ongoing, indeed accelerating, industrialization process, not so much in the manufacturing of products than in the production of all those so-called "services" which shape and condition our ways-of-life: education, health, leisure, food, birth and death, etc. No one would question the fact that services also are products in their own right. But where and who are the designers of these products, the analogous of our nineteenth-century product designers? Thousands of ill-designed products thus are waiting to be conceived and shaped by designers, so that they correspond, not only to the needs, but also to the aspirations, hopes, and life-projects of their users! Indeed, services are immaterial objects and complex systems, as anybody knows who has ever faced a hospital or school bureaucracy (and who hasn't?). I am convinced that the methodologies developed for the design of material products could be transferred to the world of immaterial services, provided adequate epistemological care is taken.

4 The fourth way one can predict the vanishing of the product is, of course, on ecological grounds. Nobody contests the fact that there are too many products in our environment, and many designers already are engaged in a more sustainable design attitude. Standards such as "Factor-10" or even "Factor-20"; and concepts including Ezio Manzini's "negaproducts" or Philippe Starck's "non-objects" are but some representative signs of, not only the possibility of, but the necessity for, products to vanish in the near future.

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Where Do We Stand?

Although the purpose of this paper is to lay some foundations for a renewal of design education and research, it is still too early to draw conclusions. All I would like to do is to indicate some directions for further research and constructive work. Let me sum up the principal stages of the above discussion.

An archetypical model of a curriculum for design education has been described in the form of a three-part structure, art / science / technology, enclosed within a general purpose for design. In order to figure out what the content of these three components would be and how they should be articulated, it is necessary to establish an epistemological / methodological model for the design process or project. If we further accept the fact that the canonical, linear, causal, and instrumental model is no longer adequate to describe the complexity of the design process, we are invited to adopt a new model whose theoretical framework is inspired by systems science, complexity theory, and practical philosophy. In the new model, instead of science and technology, I would prefer perception and action, the first term referring to the concept of visual intelligence, and the second indicating that a technological act always is a moral act. As for the reflective relationship between perception and action, I consider it governed not by deductive logics, but by a logic based on aesthetics.

The second aspect at stake is the specific training necessary for perception, action, and their relationship to be carried out adequately and consistently by students. I believe that visual intelligence, ethical sensibility, and aesthetic intuition can be developed and strengthened through some kind of basic design education. However, instead of having this basic design taught in the first year as a preliminary course, as in the Bauhaus tradition, it would be taught in parallel with studio work through the entire course of study, from the first to last year. Moholy-Nagy used to say that design was not a profession, but an attitude. In the same vein, Pierre Hadot reminds us in his writings that ancient philosophy was not a speculative occupation like it is today, but a way of life, ("a mode of life, an act of living, a way of being"), and he describes the "spiritual exercises" which were designed to realize a transformation of one's vision of the world—that is what a paradigm shift is really about—and which involved all aspects of one's being: intellect, imagination, sensibility, and will. I suggest that we endeavor to construct our basic design in the form of a series of such "spiritual exercises," the nature and content of which would be adapted to our contemporary world and future challenges. Moholy-Nagy's pedagogical work at the New Bauhaus / School of Design / Institute of Design in Chicago would be a good starting point for such a difficult and demanding task.

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This program may seem too ambitious and somewhat foreign to the design professions as we know them today. To the first objection, I reply that, if we don't want design to become or remain "a branch of product development, marketing communication, and technological fetishism," [22] i.e., if it is not to remain a **reactive** attitude, it will have to become **proactive**; in other words it will have to propose "new scenarios for the future" (Manzini). To the second objection, I reply that the profile of design professions need not—and should not—remain what it is today, otherwise these professions might disappear. It is, therefore, our responsibility to imagine the future profile of our professions, a task to which I have tried to contribute here.

22 H. Boekraad and J. Smiers, "The New Academy."

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