Rethinking the Environment. An Introduction to Matko Meštrović's 'Dizajn i okolina' ['Design and Environment'] from 1980

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The article 'Dizajn i okolina' was first published in Croatian in 1980 as a chapter in the book *Teorija dizajna i problemi okoline* [*Design Theory and Environmental Problems*] by Matko Meštrović, a leader in the semantic and theoretical articulation of the concept of design in the local context of Croatia, which from the 1945 to the end of the 1980s was part of socialist Yugoslavia. Meštrović, still active in his eighties, is an art historian, and was an engaged member of the art group Gorgona and in 1961 was a founding member of the international art movement New Tendencies. The New Tendencies movement was the proper context for developing much deeper insights into design as a creative practice, because it paid significant attention to emerging areas of culture, such as television, computers, visual poetry, experimental art, and generative art and design.[1]

It was Meštrović who, in the early 1960s, established the concept of *dizajn* ('design') as a replacement for the previous notion of *oblikovanje* ('form-giving'). In doing so, Meštrović also established a type of academic reflection on the new social reality created by contemporary economic reform in Yugoslavia. Throughout that decade he was strongly aligned with the theories of the Ulm School, which influenced many of his views on design as a humanizing activity situated in the social and natural environment. The ideas of the Ulm School were pervasive in academic circles in Zagreb and Croatia throughout the 1960s. Tomás Maldonado, Gui Bonsiepe, and Claude Schnaidt were even contributors to the special issue of a bilingual (Croatian and English) magazine, *Bit International*, dedicated to design.[2] The magazine was published as a part of the activities of the New Tendencies movement, so in a way, this special issue of the journal became dedicated to the Ulm School after its closure in 1968.

From the 1960s onward, Meštrović was consistently exposing the public dimensions of design practice to criticism from various perspectives and in multiple contexts, from cultural to economic. Later in the 1970s and 1980s he developed a much wider view of design practice, as he saw the potential for its development within the political frame of Yugoslavia's socialist self-management. The leftist influences of the Ulm School are therefore obvious, but more as a critical upgrade of the context in which the author was living. A substantial part of Meštrović's text is dedicated to the Marxist critique of Western science (by means of materialist philosophy) and therefore to a sort of scientifically-grounded design theory. In a wider context, Meštrović criticizes even Jay Forrester's predictive mathematical model, which served as the frame for the report the Massachusetts Institute of Technology (MIT) made for the Club of Rome.[3] According to Meštrović, Forrester's model is a clear example of a scientific formulation which lacks true insights into social class relations and inequality, and fails to see human variables as key factors in social change. Because of that, as Meštrović continues, such an approach has no cognitive potential to change the social order for the benefit of the majority

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of the population. While such an approach in the leftist critique of capitalism was mostly based on Karl Marx's *Das Kapital* (Hamburg: Verlag von Otto Meissner, 1867–1894),[4] Meštrović is building up his critical insight mostly on the basis of the ideas and concepts of Hans Magnus Enzensberger, whose essay *Zur Kritik der politischen Okologie* was translated into Croatian as early as 1974, and is referenced throughout Meštrović's text, along with those of another interesting Marxist writer, Andre Gorz, aka Michel Bosquet.[5] Meštrović follows Enzensberger's ideas of how 'naturalism of men and humanism of nature'[6] is endangered by mass-scale production, and how any design action seeking to restore the lost equilibrium has to see the environment not only as natural but also as social. To sustain the natural environment means to change the social, Meštrović claims. Hence the shortcomings of the MIT report, Meštrović asserts, as he sees it as no different from any other new form of sustaining existing class relations.

The article 'Design and Environment' also represents a critical appraisal of the Ulm School's approach to design, after decades of the author's engagement with it. Meštrović is searching for a method which will produce real results rather than just theoretical intentions. Meštrović points out that the collapse of the compromise about being radical, followed by a reconciliation with the mass-scale economy perspective which proved unproductive, ultimately led to the closing of the Ulm School. Therefore, little was achieved in a real social context, as opposed to a theoretical one. The author, of course, pays tribute to the Ulm School philosophy but also clearly demonstrates its shortcomings in the very fact that it did not succeeded to survive the contradictions of mass scale economy. By relying on Maldonado's book *La speranza progettuale* and Bonsiepe's article 'Diseño industrial, funcionalismo, y Tercer Mundo',[7] Meštrović is putting forward the idea that even the most revolutionary concepts for overcoming the negative influence of mass production on the natural environment still lack the power to bring the real change, which Meštrović identifies as a political one. He sees Maldonado's body of ideas on the environmental role of design as a most developed approach, but as still entrenched within capitalism, and therefore without real power to influence social change. On the other hand, Meštrović was building up his critique from the social and political context of socialist self-management. What were the real social effects of his theories?

This article was one of most important pieces of Meštrović's book *Design Theory and Environmental Problems*, published in 1980.[8] His work was recognized immediately, and was included as compulsory reading in most art and design theory courses at universities across Croatia and Yugoslavia. Moreover, in 1985 the text was included in the influential reader *Dizajn i kultura* [*Design and Culture*] edited by one of Yugoslavia's most active art critics, Jesa Denegri,[9] along with texts by Giulio Carlo Argan, Tomás Maldonado, Filiberto Menna, Umberto Eco, Jean Baudrillard and Victor Papanek. It was the first reader of this kind to introduce a local audience to a variety of viewpoints on design practice. In his introduction to the volume, the editor pointed out that, being an art critic and not an expert in design issues, he had selected a range of representative critical thinking for a wider cultural audience. Although Meštrović's piece was the only local contribution to the reader, it should be noted that academic production in design theory and criticism within the local context of socialist self-management was significant, and there were other interesting authors too.[10] In his later account of the New Tendencies movement, Denegri again dedicates a significant part of his analysis to Meštrović's contribution to design theory in Croatia as part of socialist Yugoslavia, and in particular to this very text.

In *Od oblikovanja do dizajna*, a panorama of essays on design theory published originally in Croatia from the early 1950s to the late 1980s, Meštrović's stands out as the work of a seminal author.[11] As an account of the semantic and cultural construction of the concept of design under socialist self-management, Meštrović's contributions to this volume, and in particular this text, can be pointed to as extremely important for the establishment of design practice in Croatia, and especially for the foundation of the interdisciplinary School of Design in the University of Zagreb in 1989.

His involvement with the Centar za industrijsko oblikovanje or CIO (Centre for Industrial Formgiving) is of particular interest for understanding his position as a design thinker within the local social and political context. CIO was a government-funded design agency which followed the new economic policies introduced in the 1963 economic reform. CIO's goal was to establish design culture and to introduce design methodology into industrial production. As a head of research and information activities in CIO until 1968, Meštrović was a mastermind behind some of the most influential publications and a regular contributor to the magazine *Dizajn*.[12] His body of theoretical work enhanced efforts towards economic reform by adding a dimension of culture and theory to the amalgamation of the state-planned economy with elements of free trade. This effort, however, was never met with wide understanding from the political élite. In late 1969 Meštrović organized the symposium 'Industrial Design and Social and Economic Tendencies in Yugoslavia', and edited its proceedings.[13] Although this was the most comprehensive attempt by Meštrović and his fellow design thinkers to shed light on design issues from the viewpoint of various social stakeholders, the wider recognition of the social potential of design practice remained neglected by policy makers. Meštrović's strong critique of local industrial conditions and argument for the need to implement sustainable design methods within industrial production remained unrecognized by the social élite.

This article has never before been published in English. Presenting it to a wider audience now, almost thirty-five years later, is significant for two reasons. First, the text offers an insight into critical thought on design within a social and political context that no longer exists. This article is the most representative of a number of serious articles that attempted to critically construct design within the ideology of social equality.[14] Social and cultural lessons and reflections on the transformative power of design practice from the recent past, within the turmoil of the environmental, social, and economic problems and debates of the contemporary world, should carry some ethical and sustainable potential for design theory for a better human future.

The second reason why this text is relevant lies in the fact that it is an interesting example of design thinking 'on the edge', within the 'marginal modernity', as Tony Fry would probably put it,[15] in a social and economic context that was different from—and even opposed to—the mass-scale economies of the age, and most of all to Western capitalism. The former Yugoslavia was an ideological and social experiment, with a specific belief and value system surrounding social balance and participation, but this experiment failed and had come to an end by the beginning of the 1990s. Design discourse developed as a cultural strategy to achieve a social balance throughout that historical context. Meštrović's text is a representative example of a much wider body of theory from the period of socialist self-management, which is currently unknown to the wider global audience. What is important to notice here is that 'Design and Environment' is a very early outline of social criticism based on environmental issues that continue to be of great importance today. To conclude, if there is a need today to rethink design practice as a part of the change that mankind should undertake in its

relation to the environment, then this work by Matko Meštrović offers an early example of action-oriented design theory within a political system which was oriented towards humanizing the social and natural environment, but failed to be sustainable.

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Notes

1 Margit Rosen, 'The Art of Programming', in *A Little-Known Story about a Movement, a Magazine, and the Computer's Arrival in Art: New Tendencies and Bit International, 1961–1973*, ed. Margit Rosen (Cambridge, MA; The MIT Press, 2011), 31 note 39; Peter Weibel, 'Digital Art: Intrusion or Inclusion', in Rosen, *A Little-Known Story about a Movement*, p. 44.

2 Matko Meštrović, 'U počast Ulmu' ['Homage to Ulm'], *Bit International* 4 (1969): 3–9. Articles from Ulm protagonists published in this bilingual theme issue were: Tomás Maldonado, 'Is the Bauhaus Relevant Today?', *Bit International* 4 (1969): 9–19; Tomás Maldonado, 'How to Fight Complacency in Design Education?', *Bit International* 4 (1969): 19–29; Tomás Maldonado and Gui Bonsiepe, 'Science and Design', *Bit International* 4 (1969): 29–51; Gui Bonsiepe, 'Education for Visual Design', *Bit International* 4 (1969): 51–61; Claude Schnaidt, 'Architecture and Political Commitment', *Bit International* 4 (1969): 61–75; and Gui Bonsiepe, 'Commentary on the Situation of the HfG', *Bit International* 4 (1969): 75–83.

3 Donella H. Meadows, Dennis L. Meadows, Jørgen Randers and William W. Behrens, III, *The Limits to Growth*, New York: Universe Books, 1972, translated into Croatian in 1972, and cited in Meštrović's article following in note 3.

4 See Phil Gasper, 'Bookwatch: Marxism and Science', *International Socialism Journal* 79 (2002), accessed 10 September 2015, http://pubs.socialistreviewindex.org.uk/isj79/contents.htm; Gary Werskey, 'The Marxist Critique of Capitalist Science: A History in Three Movements?', *Science as Culture*, accessed 15 September 2015, http://human-nature.com/science-as-culture/werskey.html.

5 Hans Magnus Enzensberger, 'Critique of Political Ecology', in Hans Magnus Enzensberger, *Critical Essays*, eds Reinhold Grimm and Bruce Armstrong (New York: Continuum, 1982), 186–224, first published in *New Left Review*, Series I, 84 (1974), 3–31. Original: *Zur Kritik der politischen Ökologie*, Berlin: Kursbuch Verlag, 1973.

6 Enzensberger, *Critical Essays*, p. 223.

7 Tomás Maldonado, *La speranza progettuale*, Turin: Einaudi, 1971 (English translation, *Design, Nature and Revolution, Toward a Critical Ecology*, New York: Harper & Row, 1972); Gui Bonsiepe, 'Okolina, Industrijski dizajn i treći svijet' ['Environment, Industrial Design and the Third World'], *Život umjetnosti* 15–16 (1971), 84–88. The original text by Bonsiepe was published in Buenos Aires in 1970: 'Diseño industrial, funcionalismo, y Tercer Mundo', *Summa* 25, no. 5 (1970): 54–57.

8 Matko Meštrović, *Teorija dizajna i problem okoline* [*Design Theory and Environmental Problems*] (Zagreb: Naprijed, 1980), 241–255.

9 Jesa Denegri, ed., *Dizajn i kultura* (Belgrade: SIC, 1985), 101–117.

10 For the development of a theoretic discourse on design within the context of socialist self-management, see Fedja Vukić, 'The Concept of Formgiving as a Critique of Mass Production', *Design Issues* 23, no. 1 (Winter 2007): 61–72, Fedja Vukić, *The Other Design History*, Zagreb: UPI 2M Books, 2015.

11 Fedja Vukić, ed., *Od oblikovanja do dizajna* [*From Formgiving to Design*] (Zagreb: Meandar, 2003), 389–415.

12 *Uputstvo za industrijsko oblikovanje* [*Industrial Formgiving Manual*], Zagreb: CIO, 1964; *Osnove metodologije industrijskog dizajna* [*Industrial Design Methodology Fundamentals*], Zagreb: CIO, 1968; *Upravljanje industrijskim dizajnom, organizacija dizajn biroa* [*Industrial Design Management, Organization of Design Office*], Zagreb: CIO, 1970. Twelve issues of *Dizajn* were published by CIO from late 1967 to 1968.

13 The symposium was held in Zagreb, 22–24 September 1969. The proceedings were published by the Workers' and People's University.

14 Fedja Vukić, *Modernizam u praksi* [*Modernism in Practice*] (Zagreb: Meandar, 2008), 229–259.

15 Tony Fry, 'A Geography of Power: Design History and Marginality', *Design Issues* 6, no. 1 (Fall 1989): 28.

Design and Environment [Dizajn i okolina]

Matko Meštrović

This article discusses the differences between ecological and environmental approaches to design, where design is understood as a practice of vital importance both for human society and for the natural world. The author argues that an environmental approach to design is a sort of holistic method as articulated by the key thinkers of the Hochschule für Gestaltung in Ulm (the Ulm School of Design). By defining the differences in intellectual understandings of ecological and environmental categories, the author brings the epistemic discourse of design theory and practice to the level of scientific discourse on social and economic relations. Through his critical discourse, the author tests the advantages and shortcomings of the Western scientific approach (embedded in capitalism), concluding that in order for change to occur it is the socio-political system and means of production that need to be changed first—not just design method.

Keywords: design criticism—design theory—ecological design

Environmental versus ecological approaches

An adequate conceptual framework for design as an endeavour that strives for the complete transformation of the historical world should be grounded in the way the science itself is conceptualized. It should be grounded on the idea of science as a 'conscious production of movements of history';[1] as historical thinking that studies the social reality of nature, rather than natural reality of society. Even the most basic attempt to bring together such an understanding of design with the growing environmental issues faced by contemporary societies implies a terminological discussion which has to determine not just that standpoint or the extent of its theoretical grasp, but also the true position of actors on the historical stage.

There are several generally accepted definitions of ecology, all of which make a distinction between ecology as a branch of biology that studies relationships between organisms and their surroundings (bionomics), and ecology as a branch of sociology that deals with the distribution of people and their institutions, and their mutual interdependence. In addition, environment is generally defined as: (1) an aggregate of surrounding things, conditions and influences; (2) an act of surrounding; (3) a state of being surrounded; and (4) that which surrounds.[2]

If one takes the primary meanings of these words literally, ecology could be understood as a science or a scientific discipline, and environment as appearances and processes studied by this science, where ecology subsumes the scientific view of a particular subject, and where environment refers to developments in some objective whole. However, the secondary and other derived meanings of both words reveal something else, particularly when compared more closely and understood as mutually dependent concepts. In such a view, ecology can be understood as a branch of the social rather than just the natural sciences, and environment as not just the state of being surrounded, but also as an activity in this surrounding. It encompasses all *agents* of that surrounding.

This last distinction is especially important: it is not singularly or primarily about observing and studying environmental phenomena from the position of positivist science (scientific and objective views), nor it is simply about ecology as a bio-sociological discipline (or disciplines);[3] it is about relationships with all active historical forces. It is about historical relationships which allow for subject–object relations.

The perspective of positive science, only at first glance independent of ideological context, is the one evident in the report of the Club of Rome in its appeal to leading politicians and the world public, alarmingly warning about the nearing limitations of the exponential growth of industrial production and of the number of people on the planet. Although the authors and promoters of this document state that their intention is to encourage the understanding of the interdependence of economic, political, natural and social components comprising the global system in which we all live, practically speaking their state of the world analysis may be reduced to a simplistic computer simulation of solely quantitative growth indicators, e.g. of population, industrial and agricultural production, pollution and exhaustion of natural resources. Such analysis makes a classical *quid pro quo* between symptoms and causes of this disease that spread through the whole world.[4]

This substitution is not accidental. Bourgeois science operates by dividing natural and social processes, which science then tries to transcend in its own specific way by reducing social sciences into the frame of natural ones. It is as if such a science does not know that nature, for a man, is always mediated through society, and society through nature.[5] This is why such a science can accept the definition of the balance of the global system as given in *The Limits of Growth*:

> Balance means a state of equilibrium, a counterpoise between opposing forces. In the dynamic terms of a global model, opposing are those forces which cause an increase in population and capital reserve (preferential family size, low birth control efficiency, high capital investment rate), and those causing a decline in population and capital reserve (food shortage, pollution, high depreciation or aging rate).[6]

Here, mechanical relations substitute for historical, and natural relations substitute for social, so that even capital functions as mere greatness without social meaning. It is

about a kind of revival of Malthusian theories on the immediate interdependence of the surpluses of both population and production and the interdependence of the surpluses of consumption and population. However, both of these theses were rebuked by Marx, showing how various social modes of production correspond with different modes of population growth and overpopulation. Overpopulation is a historically determined relation limited by certain conditions of production, rather than by some absolute limit of the available means of living.[7]

The aforementioned analysis ordered by the Club of Rome from a group of scientists at The Massachusetts Institute of Technology is based on the work by Jay W. Forrester, a pioneer in world modelling. He claims that the human mind is not capable of interpreting the behaviour of social systems because, according to him, they are non-linear feedback systems with multiple loops of retroactive effects. Mental models, world images according to which we act and make long-term decisions, cannot, with their own intuitive structures, foresee all the implications of what we imagine and propose, because multiple interactions between sets of different variables are simply incomprehensible. Even computer models, Forrester admits, come from the same source as these mental models. However, the important difference is that computer models are explicit; their mathematical language is unequivocal. In this case, it is about models that deal with system structure, not his statistical description. Such a model necessarily contains assumptions about the system itself, and it can be relied upon, as Forrester explains, only as much as the expertise that stands behind the formulation of the model. In other words, the model can only be relied upon to the degree that it manages to grasp the essence of the social system it models. This is so because, as Forrester continues, today there is no problem with a lack of data; rather the limitation lies in our inability to correctly foresee the consequences of the available information.[8]

Forrester's claim is acceptable, as is his opinion that we are on the verge of a new era in the clearing of human paths, and that efforts toward a better understanding of the nature of social systems are crucial. However, key questions remain: How is society conceived? How and according to what criteria are its structures discerned?

The Limits to Growth discusses the world as a whole and is based on a certain concept of totality, but it does not specify the social or historical nature of this concept. The report takes the *world* and *humanity* into account, but not the world of capitalism. Were this report to make its idea of totality more precise, it would have to expose itself to the workings of its own analysis. In other words, the report would have to analyse its own assumptions of historical being in the name of which it interprets the state of the world. Placed in this framework, the object of its analysis would not be 'humanity's common problems', but rather the problems that capitalism generates in its state-monopolistic shape that subsequently reproduces itself on both national and global scales. It is in such a context that the critical initiative undertaken by the Roman consortium of industrial powers would be truly explicit and unambiguous.[9]

In its most lucid moments, bourgeois thought has managed to give important and indirect illumination upon certain critical phases of the evolution of modern capitalist society. Galbraith's theory of the 'affluent society' in the midst of economic boom and huge technological undertakings of public entrepreneurship, supported by powerful state funds during the fifth and sixth decades of the twentieth century, did not mean anything other than the ideological and theoretical termination of the remnants of liberal conceptions and the affirmation of the state-monopolist phase in the development of capitalism. In the same way, *The Limits to Growth* is above all an ideological expression

of the overgrowth of the state-monopolist phase into a new organizational phase of capitalism, realized through multinational companies which have become the natural mode of capital internationalization in mature capitalism. As such, *The Limits* constitutes an implicit critique of state-monopolist capitalism and its inability to continue to maintain the basic assumptions of the capitalist socio-economic formation; that is, private ownership over the means of production, class power of these owners and their limited class consciousness. Already in Galbraith's analysis, we can see the tendency of huge corporations to overgrow the limits of the national economy and, with the help of the government, assert their unbridled power across the world. Today, multinational capital, a powerful but still not domineering socio-economic relationship, has initiated a confrontation between the old and new types of capitalism through an explicit critique of the ideology of affluence. It is obvious how such criticisms cannot quite hit their mark. In order to do so, they would have to overcome the world of appearances and revise the very grounds of the capitalist mode of the production of life.[10]

As a scientific discipline, ecology is only about one hundred years old. Its founder Ernst Haeckel (*Natural History of Creation*, 1868), who conceived of it as a sub-discipline of zoology, set to study the totality of relationships between animal species and their inorganic and organic surroundings. Later, the concept of the ecosystem extended the meaning of this discipline to the mutual interdependence of all macro- and micro-inhabitants of a certain part of the biosphere. The inclusion of man in this conceptualization transformed ecology into a hybrid discipline, causing confusion between what had until then been more or less clearly distinguishable categories and methods of natural and social sciences.

If we take ecology as the starting point for the prediction of social phenomena, then this might raise contentious questions that ecology cannot resolve. It is for this reason that the mass ecological movement assimilated an array of mostly hidden political motives and interests into one very convoluted ideology.[11] The movement operates under two assumptions: the assumption that industrialization will continue in the future, and the assumption of scientific arguments that partly come from biology.

Doubtless, all these problems should be treated in a single, all-encompassing framework, not necessarily an exclusively ecological one, and not simply because ecological consequences such as the pollution of oceans and atmosphere, spreading of radioactive isotopes and climate changes, are truly assuming a global scale.

It is man that is in question here. Thus, the mediation between the whole and its part, between the subsystem and global system, cannot be explained biologically. This mediation is of a social character, and its explanation requires an elaborate theory of society, as well as respect for the basic assumptions of historical processes which ecology as a scientific discipline cannot offer.[12]

Therefore, a critique of ecological opinions and ideological formations based on discoveries in ecology must not remain at the level of ideology. Such a critique would be in danger of becoming ideological in its own right, if instead of critical intervention in a methodological research of reality through theory and practice, this critique could become a means of defence against reality itself. With this objection, Enzensberger alludes to some tendencies of leftists and doctrinal Marxists who, in their interpretations of ecological problems, are prone to 'blame capitalism for everything' and deny the relevance of these issues for socialist countries. Only when one understands capitalism as a mode of production, and not simply as the relations of ownership, can one understand ecological problems in a Marxist way—as disruptions in the exchange of

matter between man and nature, and as a contradiction between use and exchange value which even a socialist society has yet to overcome. In socialist society as a transitional social system, the capitalist mode of production in essence still exists. Despite all the new elements that the socialist social form brings, in it the wage relationship and commodity production have still not been historically overcome, and it is exactly these that exert a deciding pressure on the political sphere and relationships between people. Moreover, the very development of socio-economic relationships in the contemporary world, especially in recent decades, shows more obviously how productive forces are not just independent of relationships of production, but also that every attempt at a radical change in relationships of production also implies a change in the nature of the productive forces, or the change of the mode of the usage of these forces.[13]

The United Nations General Assembly adopted a series of resolutions between 1968 and 1969, leading to many-sided preparations and resulting in the Stockholm conference on human environment in 1972. This conference disseminated scientific findings emphasizing the seriousness of disruptions in the global ecological balance. In its attempt to mobilize public opinion and achieve a consensus on environmental ethics among member countries, this initiative succeeded in outlining in detail which and what kind of powers are in question here, and what kind of socio-historical conflicts are of concern, although the initiative failed to refer to them by their exact names.

Man has always lived in two worlds: in the world of natural things, from which comes his physical existence, and in the world of tools and artefacts, made up of social and political institutions which man forged for himself. Development in quantitative aspects of human action resulted in qualitative modifications of physical basis for man's existence. Therefore, as detailed in the materials of the aforementioned conference, it is not just about the excessive growth of the population of our planet and the nearing of the limits of the capacity of its natural systems. It is also and primarily about our understanding of economic growth, and about the necessary shift from quantitative to qualitative indicators of growth.[14]

It has been estimated that by the year 2000, the world population will reach seven billion people, three-quarters of which will be in under-industrialized countries. Due to internal migration, urban growth will be twice as fast as the total growth of the world population. This means that in order to accommodate this growing population, more buildings will have to be built in one generation than have been built in the whole of human history. Human activities are most intense in human settlements, and it is here that the most dramatic changes of natural surroundings take place. This man-made environment has the deepest and strongest influences on man.

The environment is agreeable if it provides minimal conditions like shelter, work and the satisfaction of biological, social and cultural needs. Therefore, planning must not follow one-sided or rigid patterns. Instead, it has to be understood as an *utterly flexible process*, with a dynamic interaction between planning and execution. For planning such as this it is necessary to establish a framework of research coordination across all disciplines of both the social and natural sciences, while taking into account that even the best research does not have meaning until a real communication has been established between those who work in research and theory, and those who work on programmes and action. In tandem, the active participation of the wider public in the activities of planning and management of these human settlements should be secured. Such participation may be meaningful only if all participants are well-informed.[15]

In numerous studies prepared for the conference in Stockholm, a compilation of over 10,000 pages, a special international group of experts undertook the task of examining how attitudes towards environmental planning could be fitted to the developmental perspectives and urgent needs of developing countries. A report by this group (Founex, May 1971) confirmed that, at least theoretically, the conflict between development and environment is not unavoidable; that on the contrary, environment and development can be aligned and mutually supportive if the very *pattern of development* equipoises environmental goals with goals of the economy, society and culture. However, as the report explained, the environmental actions of industrial countries can have deep and varied influences on the growth and on the exterior economic relationships of developing countries.[16]

The fight for an agreeable environment is nothing other than a demand set before man to be more able to develop more fully. The environment, as material culture, is the carrier of a value system. Such an understanding of the environment as a dimension of human development is an important political issue. After all, practical solutions to these problems obviously depend on the political ideology in power. However, the fact remains that in the final analysis all acceptable solutions should lead to satisfying the basic needs of man, who by demanding to have more, at the same time longs to be more.

As far as scientists are concerned, one could not say that the final goal of their research is their primary occupation. Responsibility for the environment lies on several levels: political, scientific and individual. Those in decision-making positions would have to set priorities for scientific research according to real human needs. Scientists should not take over the roles of these decision-makers. They should rather focus on their moral obligation to think critically and analyse the goals of their efforts. On the other hand, an individual must assert his own decisions and freedom through both his personal behaviour and attitude towards technological achievements. However, there can be no effective action unless the institutional structures of decision-making are re-examined, unless it is ensured that accepted politics reflects the general interest instead of just the interests of powerful groups.

Growing consciousness that the concept of environment is articulated in man, that development should be brought back to its original purpose—the increase of human wellbeing—reflects itself in the aspirations for physical and spiritual protection and safety, for a *meaning-bearing environment*. In such an environment a man, in order to survive, must find his own meaning and his own qualities, his own orientation and belief system. In such an environment, a man must have open access to others and must freely interact with them in order to exchange his own experiences, renew his body and entertain his spirit. Unpleasantness and disturbances caused by a poor environment, from noise to physical or aesthetic pollution, can be experienced by an individual as an attack on the integrity of one's personhood. These sensations necessarily turn into anxiety, which is why many adaptations and acculturations are actually understood as a kind of deformation.

The fight for the environment is the point of convergence of all the biggest social problems of contemporary humanity, with a great clash between the developed and undeveloped world. The environment is an image of society pervaded by its values. The environment reflects the state of society and its readiness for development. The environment's evils and misfortunes are thus much more than just the price of progress: they are symptoms of a deep crisis in the evolution of modern societies. No long-term solutions can be found outside of this realization.

It is because of this reason that any act of the environment's rearrangement, any intervention in the relationship between man and his surroundings, any assessment of

pertaining values associated with such change, implies decisions of a political nature. It is important to emphasize that the definition of environment itself is also political—it can be conservative, progressive or even revolutionary.[17]

Through the conference in Stockholm, the United Nations has shown its nominal openness towards the social change that inevitably leads to socialism as a part of the world's historical process. They have done so by making their scientific, technical and personnel resources available, and by striving for a wide programme of international co-operation and the efficient application of available resources and knowledge to address and solve environmental and developmental issues. Many radical factions and internationally-networked ecological groups, which have gathered on numerous informal occasions and in various manifestations, have expressed their concern that the ecological movement will only remain a safety valve for the existing socio-economic order if it does not invest its efforts in the thorough change of all aspects of modern life.[18]

It was the 1970s that brought about the extraordinary revival of practical political activity not only in the international workers' movement, but also in the altogether new, theoretically-deepened interpretations of Marxist understandings of the role of production forces in the development of society. In them, a notable realization has been delineated, that productive forces and relations of production are not independent 'entities' and their interaction is not mechanical.

Productive forces developed on the grounds that the production and reproduction of capital follow the direction of a more complete socialization of various aspects of the production process, and thus tremendously increase man's power to use nature. However, one should not forget that this is achieved through a social process that repeatedly submits a producer to capital, and consequently deepens the rift between workers and the objective conditions of their productive activity. As La Grassa makes clear, there is no techno-economic 'space' separated from the social 'space'. There is only one united socio-economic space in which the 'social' gives meaning to the development of the 'economic'.[19]

The content of this 'sociality' within a given socio-economic space defines what is scientific, and what the limits of the areas of science are. It defines the very language and objects of science, as well as its implicit ideological character. Recently, the latter issue has been embroiled in critical deliberations by independent Marxist theorists, leftist intellectuals and many scientists who are coming to realize that the ruling class shapes science according to its own agenda. Andre Gorz claims that contemporary society withholds the labels of what may be defined as scientific from all kinds of knowledge, abilities, and qualifications not integrated into capitalist relations of production. These labels are reserved only for the kinds of knowledge and abilities that are transmitted through the official system of education. Knowledge acquired in an autonomous way, no matter how efficient, 'does not enter the category of scientific in mainstream culture because it does not agree with a hierarchical division of labour, characteristic for capitalism'.[20]

A selection deployed by such a society, in which authority does not depend on ability, but where ability depends on the function of authority, makes science inaccessible, not because of the difficulties of the scientific method, but because in such a science the development of theory is severed from practice and from life, from the needs and activities of the people. Modern science was born in the context of bourgeois culture, and as such it never had the possibility to become popular science. Its professional language is removed from everyday speech, and is dependent on a techno-scientific subculture.

Such language can only be applied to other such subcultures and within the framework of large industrial institutions. Therefore, regardless of whether it is theoretical or technical, general or specialized, scientific knowledge and education are most often unusable in life and autonomous activities, even for those who have acquired them.

The functionality of science, with regard to society and the domination of capitalists, comes not from the division of labour reflected in language, nor from the determination or fragmentation of the sub-disciplines of science. It is functional primarily because it asks certain questions more than others, and because it does not ask questions which the system cannot resolve. Just as industry was discovering that science may be a productive force, so the production of scientific knowledge was being subdued by the division of labour that governs commodity production. Scientific work suffered the same evolution as productive work. Here too, the function of the employers consisted also of the merging of work, which they have divided and fragmented. It is the monopoly over this function that was the basis of their power.

In scientific production, in the industrialization of research, which caused an exaggerated specialization and fragmentation of scientific work, it is the same oppressive hierarchy that holds power as in industrial production. This is the reason why workers in science are not able to demand or acquire power. They are not able to unite on a class basis and define their mutual project and concept of the whole society. The type of knowledge they possess is individually and collectively subdued and cannot be turned against the capitalist system due to one simple reason: this type of knowledge bears the marks of the social division of labour and capitalist relations of production.

A science worker is simultaneously both the product and victim of such a division of labour. A science worker could cease being the victim of such a division of labour only if he or she could reject being its product. This is a very difficult choice, being simultaneously ethical and political. Such a choice would have to be grounded in the realization that the whole of scientific and technical progress, as well as the progress of power, is negative when it creates a permanent difference between professionals and non-professionals. 'Knowledge, just like everything else, does not have value if it is not intended to become the common good of all.'[21]

Scientific action and historical subject

The marginal position of design as a separate technical practice in the general development of productive forces has not prevented the most lucid thinkers of this trade from noticing the historical dimensions of environmental concerns, and to rise above the social and class conditionings of design as a profession. They succeeded in raising critical thought on design to the level of historical thought by transcending professional frames and the practical conditions of their trade. In this way they confirmed Fuller's thesis that design represents a point where man 'stretches out his neck' in an attempt to use his scientific potential.

In his résumé of the Ulm School's legacy, it was Gui Bonsiepe who first emphasized that the question of environment cannot remain secondary in the decision of whether or how a society or social system can survive. He underlined how the answer to this question may not be separated from the context of contradictory historical circumstances. The Ulm School shook the conservative position that maintains that problems of design may be solved by designing. The School also warned of the need to think through the designer's relationship with science. This relationship, as Bonsiepe maintained, has to switch from a receptive to a productive one. The designer cannot remain a passive consumer of existing science, because such attitude has no future.

With the goal of overcoming the eclectic attitudes of designers, Bonsiepe found he could connect the various design professions such as urban, architectural, visual and product design under one wider concept of environmental science. Such a science would, among other things, contain not just environmental design and the science of design in a more narrow sense, but would also include the activities of planning and the management of design.[22]

In their assemblage, socio-cultural and communication environments exert a crucial influence on man. These interactions are not well-known or researched. However, without any further hesitation, a general position that circumstances shape man can be accepted, and it is precisely because of this fact that these circumstances should be shaped in a humane way. An environment arranged humanely is an environment that does not hinder the development or satisfaction of social and individual needs. A human being may change his way of life only when his environment cooperates with his efforts. Therefore, concludes Bonsiepe, the only global answer to this demand is to remove all irrational forms of power of man over man, because in a society organized according to irrational and inhumane principles, individual rationalism is annulled.[23]

The question of the scope of design as applied rationality is therefore coupled with the fundamental question of social organization. This is also a latent motive behind Maldonado's theoretical occupations, which in their ultimate conclusions are always elaborated through environmental concerns. 'The creation of our environment and the creation of ourselves are indeed philogenetically and ontogenetically unique processes.'[24] Even though ecologists consider the 'human environment' as one of the many sub-systems that make up the total ecological system of nature, they are still willing to concede that the human environment retains a special 'behaviour'. This is not just anthropocentric fiction; our sub-system is different due to its ability to use (and abuse) its relations with other sub-systems and radically influence their destiny. This '*agent provocateur*' is human consciousness, which actively influences its physical and socio-cultural surroundings.

However, it is quite obvious that the special way in which consciousness appropriates the reality of the environment decidedly influences the final structure of that reality. If work is on one side a factor of self-realization, then it is on the other a factor of self-alienation. A consciousness dissolved, weakened, or belittled by estrangement always corresponds with a certain reality of environment which can only be deciphered in terms of alienation. However, the concept of alienation, claims Maldonado, is limited and can only be helpful to a certain point.

He noticed Marx's double usage of the term *work*. When Marx thinks about *Arbeit* as an anthropologist and ontologist, he always does so in a positive sense, but when he speaks as an economist and revolutionary, he does so in an exclusively negative sense. Maldonado himself claims that neither Marx nor any of the most significant Marxist thinkers has overcome this terminological duality. He also knows that Marx connected the theory of alienation with the theory of emancipation, but completely omitted the essence of the question in this context: the liberation of labour. This is the reason why Maldonado asks the question 'what is *human environment*', more as a question of absolutes than of the historical possibilities of the fulfilment of human desires: '… ultimately, we have always, with respect to our environmental surroundings, persistently searched (but have not found) the satisfaction of one of our deepest needs as living beings: the need for our specific projection, the confirmation of final tangibility of all that we on this world are, do, or want to do.'[25]

In order to address this issue historically, one would have to implicitly question the position of the historical subject itself. In other words, one would have to know the real carrier and its own projection. It is neither a specific utopia nor a projection that is in question here, as Maldonado maintains. It is also not about the will to attain the necessary structures, actions and behaviours. What is important is the question of whose will is made real.

Going further into the problems of governance, Maldonado positions them in the frame of the factual world, as a discourse on the management of the facts that should be projected or innovated, and as '*negotium gestio*' on taking responsibility. However, he stops at the level of general science and a technical definition of governance as cognitive and operational behaviours through which information is transformed into action, while acknowledging that this process, just like any other, cannot avoid being conditioned by the world in and for which it unfolds. However, he refrains from putting forward a historical definition of such a world.

Coming from Bertalanffy's general definition that social systems, as all bio-systems, are open, Maldonado further notices that author's distinction that the uniqueness of social systems lies in the fact that one cannot exit one social system without entering another. He further notices that technicity in morphostatic processes is much greater than in morphogenetic ones, and that there is no possibility of innovation, and even less a possibility of revolution, without the founding, planning and governing of these processes. However, he does not make a significant distinction between planned and planning, which could reveal more about the historical nature of the subjectivity in question.

Maldonado objects to Boch's lack of evaluation of specific utopias in the context of action, and his reluctance to take a further step and confirm that if one wants to act effectively, critical consciousness has to be critical consciousness of technical processuality as well, and not just critical analysis of the present. That said, even on this occasion Maldonado thinks more about the *means* by which the obdurate viscosity of history can be overcome, than about the social forces to which this historical task belongs. This reflects the fact that Maldonado himself has not completely overcome the elitist disposition of his profession. 'When a planner is of a conviction that *as a planner* he can contribute to the transformation of society, he can act in that sense only to the degree to which he believes in the relative innovative autonomy of his work. Just as it is erroneous to think that planning is an alternative to revolution, so it is wrong to negate any autonomy of the planning process.'[26]

This contradiction becomes obvious at the moment one asks a question about the 'functional ubication of design in society'. Maldonado acknowledges that this problem cannot be solved other than by adopting a certain value judgement, but he does not say anything about the *historical constituents* of this judgement. On the contrary, he takes shelter in the speculative and formal game of logic: design is not autonomous reality, neither as action nor as the result of action. What makes design a heteronomous reality is its submission to that which is not design. At the same time, Maldonado also details how only despotism can reveal the formal order between things, and forget the real order between people.

Maldonado believes that a communist society will be able to create real, and not simply speculative, conditions for the reconstruction of nature, in such way that in the context of its own social and cultural practice a communist society can deliver a new 'system of needs'. Furthermore, Maldonado connects this problem primarily with the 'voluminous and complex problematics of control'. Any structuring intervention in the

area of human needs presupposes an act of control, exerted not just above needs but above objects as well, due to a simple reason: there are no needs where there are no objects—real or imaginary. The system of needs and the system of objects are mutually dependant, and they, in fact, express the system of control of human behaviour. 'Therefore, when one speaks about the change of objects and needs of capitalist society, it is the system of control that has to be changed.'[27]

Clearly, Maldonado did not take into consideration the real principles of socialist society more deeply, especially not those principles which, by overcoming his existing model, open a perspective on socialist progress as world progress. This is why he experiences contradictions between the contemporary world and the world of socialism, in that it lacks a general strategy of control, a 'strategy which would contain socialism's governing response to the congestive chaos of capitalism'.[28]

For the non-existence of such a strategy in everything concerning the study of the relations between the 'system of objects' and the 'system of needs', Maldonado blames the 'theoretical inertia of Marxism'. Until recently, it was possible to nurture the illusion that under the influence of socialism it would be possible to create favourable conditions for a radical change of the situation caused by the automobile, this 'most brutal expression of commodity fetishism' and 'the wildest cause of the destruction of "humanised nature" of which Marx speaks, and without which man is inconceivable.' Unfortunately, concludes Maldonado, in socialist countries the influence of the remains of the capitalist superstructure prevailed. The influence of the automobile blocked both sociological and technological imagination, which otherwise could provide some other type of solution for the traffic of people and commodities.

There must have been strong reasons to explain why the Soviet Union decided on such a fallacious choice; reasons similar to those in the 1920s that made the Soviet Union abandon its efforts for a revolutionary transformation of the city–village relationship. Among them are most certainly economic reasons, because it is much cheaper to adopt already-deployed solutions, even from the capitalist order, than to look for completely new ones. What remain now are only prophylactic measures to save what can be saved from *automobilism*. However, if these problems are common to both capitalist and socialist societies, as Maldonado believes, one cannot overlook one important difference between them: while capitalist society is not able to control congestive increases without negating itself, it is exactly by this control that socialist society can assert itself.[29]

Maldonado repeated his opinion at the Ninth Congress of the ICSID in 1975 in Moscow. On this occasion he expressed his conviction that the renewal of nature must at the same time be a renewal of everything that is artificial in nature, which for him includes science, as well as technology and design. 'The present crisis of the environment will be solved with the support of science and technology and with the innovative contribution of design, or will not be solved at all.'[30]

The impossibility of the renewal of nature without fundamental innovations affecting the essence of production relations and conditions of the reproduction of productive forces became particularly clear to Claude Schnaidt. In France, after the Ulm School, he tried, with the help of Andre Malraux, De Gaulle's culture and education minister, to initiate a multidisciplinary collaboration between research and education on the issues of city planning, architecture, industrial and communicational practices, all of which he considered cultural aspects of the environment. A short-lived historiography of the French Environmental Institute demonstrated how such an attempt, despite the

enlightened will of the highest intellectual authority, opposes those social positions which are deeply interested in keeping the existing division between theory and practice, between education and research, and in keeping the partitions between professions and supporting such management and cost-effectiveness of research, which are not only retrograde, but in direct opposition to the general public interest.[31]

In his short-lived but powerful attempt and despite the external difficulties with social support for his initiative, Schnaidt had to face the general condition of the science of design and the science in general. The lack of a body of specific knowledge and adequate methods that could be used to solve more complex problems in design is, according to his opinion, due to the fact that the majority of available theories do not correspond to the facts that should be explained by them. Designers work in isolation, and research efforts require an adequate environment and *research community*, both national and international. There is a dire need for the exchange of relevant information because design encompasses extremely wide areas of knowledge and practice, and experience in this regard is scattered. Congresses are trendy chats, professional journals—picture books, and design-centres—bazaars.

Design research is situated at the junction of many disciplines, which is not supported by the extremely compartmentalized traditional institutionalized structures. Educational institutions do not promote research professions, stubbornly limiting themselves to the training of the traditional type of designer. Such a designer is only seemingly capable of dealing with various tasks, and he is not able to scientifically conceptualize the experiential facts of his practice. Not even society in its entirety has been sensitized to the problems of material culture through education. The masses are not formed nor informed. There is no public opinion which would support design research endeavours. On the other hand, the logic of the capitalist system is evident in the power that large businesses exert over the state to primarily fund research which is the most profitable for them, all at the expense of research which could actually help to improve general living conditions.

Moreover, for such a wide field as environment, and its improvement and protection, the question of the actual subject of research still remains. In the search for a basic thematic classification which could be useful in the coordination of research, Schnaidt accepted the opinion of East German scientists who in three main points summarized all the essential reasons why architecture and design can be regarded as subjects of scientific inquiry.

(a) The environment is created by people and it is a result of society's production activity. The production of buildings and things means nothing less but the production of a living framework, which manifests environment as an aim worth pursuing.
(b) The environment produces effects. It is the cause and determinant of the conditions of particular subjective and collective behaviours.
(c) The environment is an organizer of various life processes, a mediator of communication between people. In this way, environmental conditions order the life of communities, and as such comprise the social and cultural function of the environment.

Schnaidt tends to accept their opinion that in such a triple understanding of the environment: as the product of collective work, as the condition of human behaviour, and as a mediator of social communication, there are possibilities for architecture and design to become the objects of Marxist theory. He is even more inclined towards the generally accepted opinion in East Germany that those three aspects should not be

considered separately, because the laws governing processes in the environment are of *systemic character*. However, in order to keep research efficient, a relatively autonomous approach to particular groups of problems may be allowed.[32]

As Schnaidt realises, the readiness to consider the living ambient (*le milieu ambiant*) as a unique field of thought and action, which clearly comes to the fore in such an understanding of environmental design, does not explain the question of the range that should be attributed to this field of activity in order to make the research operational. In his Institute he tried to answer this question by differentiating the *infrastructure* of the living framework, i.e. dispositions of the main social functions such as production, habitation, transport, consumption and education from everyday life, which cannot be analysed in functional terms because besides material it also has spiritual dimensions. He also distinguished the living framework from the creation of the environment, i.e. social and professional mechanisms which direct the generation of environment. With regard to this he concluded: if by environment one understands the totality of the living framework produced by a man and for a man, a framework which arises as the consequence of the practice preceding its conception and realization, and which conversely conditions the life of individuals and social groups, then one should research: (a) only building or producing; then (b) downstream: its natural, social and psychological consequences; and (c) upstream: conditions and actors that conceive and arrange the environment.

It is exactly in this third, 'upstream' area that Schnaidt sees the main scientific topics yet to be approached, while keeping in mind that in the transformation of the living framework, the effects of material and social determinants are never simple or unambiguous; that the practice of conception and the realization of environment are in a reciprocal relationship with the role, status, organization and professional formation of the designer; and that necessary experimental development as a coupling between the creative phase and its execution requires a methodology which is almost nowhere to be found and which does not come about on its own.[33]

In the basic idea of Schnaidt's analysis, and in its thematic elaboration, one can notice a theoretical experience which was mainly developed and synthesized by his older colleague from the Ulm School, Tomás Maldonado. However, Schnaidt founded his understanding of the theoretical and practical, scientific and educational connection of the issues of urban, structural and communicational environment in a unified action without theoretical knowledge or practical understanding of the relations of social structures. These relations do not determine an operational space as a simple 'technical' space, but as a socio-economic space. In other words, they give their limiting seal to any action of vivification of 'unhistorical' thought.

When he demands that researchers be freed from technical, social and financial responsibilities which damage the productivity of their work, that the exchange, processing and usage of information are facilitated and expedited, that the diffusion, interpretation and application of the results of research are secured, and that personal initiative needed for innovation is reconciled with necessary planning, Schnaidt himself arrives at unresolved questions as to the extent, composition and status of such research institutions, and as to the kind of structures that should coordinate, govern and control such activities. However, he is not concerned with the nature of a society in which such questions could be historically resolved in a satisfactory way. Schnaidt does not possess an actual conception of such a society.[34]

Any action of design relinquishes its intention for the transformation of the historical world if it does not project its theory in this direction. It loses its real historical

grounding, or simply accepts the level of common 'truth' which, unenlightened by critical consciousness, remains in the area of ideology irrelevant for real social progress.

Matko Meštrović

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Notes

1 Alfred Schmidt, *Povijest i struktura—Pitanja marksističke historike*, J. Brkić, trans. (Belgrade: Izdavački centar 'Komunist', 1976), 56–58 (title of the original: *Geschichte und Struktur, Fragen einer marxistischen Historik*, Munich: Carl Hanser Verlag, 1971).

2 *The American College Dictionary*, New York: Random House, 1961.

3 Edward O. Wilson defines socio-biology as a science that investigates biological ground of social behaviour, bringing into sociology genetic and other biological findings, in order to investigate social organization of man (forms of sociality). See the article by Slobodan Lang, 'Sociobiologija—rađanje nove znanosti', *Pitanja* 7/1976 (1976).

4 Donella H. Meadows, Dennis L. Meadows, Jørgen Randers and William W. Behrens, III, *Granice rasta—Izvještaj istraživačke skupine MIT za nacrt Rimskog kluba o dilemama čovječanstva*, J. Šentija, trans. (Zagreb: Stvarnost, 1974), Preface, xiii (title of the original: *The Limits to Growth*, New York: Universe Books, 1972).

5 Elizabet Romoern and Tor Inge Romoern, 'Marks i ekologija', *Marksizam u svetu* 10/75 (1975): 135.

6 Meadows, Meadows, Randers and Behrens, *Granice rasta*, p. 141.

7 Karl Marx, *Temelji slobode* [*Foundations of Freedom*] (Zagreb: Naprijed, 1974), 257–259. On Malthus Marx literally says: 'It is Malthus who abstracts from these specific historic laws of the movement of population, which are indeed the history of the nature of humanity, the *natural* laws, but natural laws of humanity only at a specific historic development, with the development of the forces of production determined by humanity's own process of history.' Ibid., p. 260.

8 Jay W. Forrester, 'Counterintuitive Behaviour of Social Systems', in *Environment and Society. A Book of Readings on Environmental Policy, Attitudes, and Values*, ed. Robert T. Roelofs, Joseph N. Crowley and Donald L. Hardesty (Englewood Cliffs, NJ: Prentice–Hall, Inc., 1974), 275, 278–279.

9 Faruk Redžepagić, 'Ekologija i kritika političke ekonomije zemalja u razvoju' ['Ecology and a Critique of Political Economy in Developing Countries'], manuscript, Zagreb, 1975.

10 Ibid.

11 Hans Magnus Enzensberger, 'Kritika političke ekologije' ['A Critique of Political Ecology'], *Marksizam u svetu* 9/74 (1974): 157–158, 161–169.

12 Ibid., pp. 172–175. Enzensberger mentions the problem of the stabilization of the usage of energy as an example of an ecologically unsolvable problem. If, instead of the American standard of energy consumption one would accept today's world average as a measure of a future 'stable' energy consumption level, then the exploitation of available energy resources as well as thermal, chemical and radioactive consequences could be kept at a level slightly higher than today. But then the main question becomes how to divide these resources, because such a demand would mean that developing countries should use three times more energy than today, and that developed countries should significantly lower their own consumption.

13 Ibid., pp. 177–182.

14 United Nations Conference on the Human Environment, 'An Action Plan for the Human Environment', Stockholm 5–16 June 1972, A/CONF, 48/5, 7–12.

15 United Nations Conference on the Human Environment, 'Planning and Management of Human Settlements for Environmental Quality', A/CONF, Stockholm 5–16 June 1972, 3, 5, 24–26.

16 United Nations Conference on the Human Environment, 'Development and Environment' (Founex Report), A/CONF, 48/10, 1–5, Annex I, 6.

17 United Nations Conference on the Human Environment, 'Educational, Informational, Social and Cultural Aspects of Environmental Issues', A/CONF, 48/9, Stockholm 5–16 June, 1972, 3, 8, 11–14, 18, 23.

18 See a detailed report and documentation in the book by Rudi Supek, *Ova jedina zemlja—Idemo li u katastrofu ili u Treću revoluciju?* [*This Earth Only—Are We Heading into Catastrophe or in the Third Revolution?*], Zagreb: Naprijed, 1973.

19 Gianfranco La Grassa, 'Proizvodne snage i odnosi proizvodnje' ['Productive Forces and Relations of Production'], *Marksizam u svetu* 10/1974 (1974): 49, 64–65, 70–72.

20 Andre Gorz, 'Klasni karakter nauke i naučnih radnika' ['Class Character of Science and Its Workers'], *Marksizam u svetu*, 10/1974 (1974): 123–125.

21 Ibid., pp. 126–127, 130–131, 133–134.

22 Gui Bonsiepe, 'Commentary on the situation of the HfG', Ulm, 21 April 1968, 8, 12.

23 Gui Bonsiepe, 'Okolina, industrijski dizajn i treći svijet' ['Environment, Industrial Design and the Third World'], *Život umjetnosti*, 15–16 (1971): 84–85, 88.

24 Tomás Maldonado, *La speranza progettuale* (Turin: Einaudi, 1971), p. 13.

25 Ibid., pp. 13–15, 18–19, 22–24.

26 Ibid., pp. 88–89, 91, 95, 117–119, quotation from p. 124 (original italics).

27 Tomás Maldonado, *Avanguardia e razionalita. Articoli, saggi, pamphlets 1946–1974* (Turin: Einaudi, 1974), pp. 217–220, 231–232, quotation from p. 232.

28 Ibid., p. 236.

29 Ibid., pp. 236, 240–243, 246.

30 Tomás Maldonado, 'Design and the Future of Environments', *ICSID 1975, 9th ICSID Congress, Moscow, Plenary Papers* (Moscow: International Council of Societies of Industrial Design, 1975), 33.

31 Claude Schnaidt, 'La morale de l'environment', Conference pronocee a l'Union Rationaliste, Paris, 8 February 1972, published in Jocelyn de Noblet, *Design—Introduction à l'histoire de l'évolution des formes industrielles de 1820 à aujourd'hui* (Paris: Stock–Chêne, 1974), 237–239. The Institute mentioned began its work in December 1969, and was closed on 31 October 1971.

32 Claude Schnaidt, 'Une recherche qui se cherche', in aforementioned publication by Busnelli, 12–14. Schnaidt does not cite the East German source, but in his bibliography there is the following source listed: Alfred Schwandt, *Gegenstand und Methode der marxistischen Architecturtheorie, In Beitraege zur architecturtheoretischen Forschung*, Berlin: Deutsche Bauakademie, 1967.

33 Schnaidt, 'Une recherche qui se cherche', pp. 14–16.

34 Ibid., pp. 16–17. The following sentences by Schnaidt testify to his lack of critical attitude when it comes to the questions of organization of society: 'These questions are not unsolvable. They were, at least partially, brilliantly solved by researchers in the United States, Soviet Union, and DDR. Even if the solutions of these countries could not be transferred completely, they can still entice us to organize an area of research that we are interested in.' Ibid., p. 17.