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Abstract: In this paper we discuss first, the nature of the mechanical world view and the crisis it has produced. Second we discuss the concept of sustainable design and the changes necessary to implement it. Ultimately we embed our principles in a document we call The Berlin Manifesto. We do this in part because we developed this manifesto for and at the Third International Conference on Design Principles and Practices which was held in Berlin in February 2009. But it is entirely appropriate to designate it The Berlin Manifesto because Berlin was the final home of the Bauhaus. The Staatliches Bauhaus was the early 20th century school that transformed the practice of design as an extension of technology and mass production. Its mechanical worldview ethic and industrial esthetics have been adopted worldwide, especially in architecture, with significant detrimental environmental effects. We believe that ideas and design can change individuals and institutions. The Berlin Manifesto, generated through an international collaboration, establishes design principles for a new age. Designers must now transform design practice. It is the sustainable transformations of the built environment and the designed object, incorporated into daily life, that will support the change of culture.

Keywords: Sustainable Design, Sustainability, Social Change, Built Environment, Worldview, Manifesto, Bauhaus

Introduction

A SPECTRE IS haunting Europe – and the world.¹ That spectre is the mechanical world view, and it threatens to undermine the fabric of human society and to destroy the planet. Industrial society is a product of this worldview, and the history of all hitherto existing industrial societies is the history of the struggle to dominate nature.

In this paper we propose to discuss first, the nature of mechanical world view and the crisis it has produced. Second we will discuss the concept of sustainable design and the changes necessary to implement it. Ultimately we embed our principles in a document we call The Berlin Manifesto. We do this in part because we developed this manifesto for and at the Third International Conference on Design Principles and Practices which was held in Berlin in February 2009. But it is entirely appropriate to designate it The Berlin Manifesto because Berlin was the final home of the Bauhaus. The Staatliches Bauhaus was the early 20th century school that transformed the practice of design as an extension of technology

¹ With apologies to Marx and Engels (1848/2008). The Communist Manifesto is part of a long tradition of documents that serve as rallying points around visions of social change to promote human welfare. It is in this tradition that we present the current manifesto.
and mass production. Its mechanical worldview ethic and industrial esthetics have been adopted worldwide, especially in architecture, with significant environmental effects. In the United States, for example, buildings are now responsible for 40 percent of energy consumption and 40 percent of waste. (Petersen n.d.)

Also, the city of Berlin has been rebuilt twice – after WWII and after the Wall fell. It has been reborn as a city in the image of the Bauhaus ideal. At the same time, Berlin poses intriguing possibilities for a sustainable future: it has one of the best mass transit systems in the world, and there is a strong Green party in Germany which can advance a sustainable agenda in a parliamentary arena.

How Did We Get Here?

The notion of a paradigm or worldview as an overarching framework which organizes our whole approach to being in the world has become commonplace since Thomas Kuhn published The Structure of Scientific Revolutions (1962). Kuhn showed that normal scientific research takes place within a taken-for-granted framework which organizes all perception and thinking. This idea of a paradigm in science can be transferred to the worldview of a whole culture. One of the most important concepts in cognitive philosophy and cognitive sciences is the German concept of Weltanschauung. This expression refers to the “wide worldview” or “wide world perception” of a people, family, or person. “The most interesting aspect of a society’s worldview is that its individual adherents are, for the most part, unconscious of how it affects the way they do things and how they perceive the reality around them. A worldview is successful to the extent that it is so internalized, from childhood on, that it goes unquestioned” (Rifkin 1980:5).

Henryk Skolimowski, in his book The Participatory Mind (1994), identified the dominant mechanical worldview of our era as Mechanos. The enduring underlying metaphor for Mechanos was defined by the astronomer Joannes Kepler (1571-1630) as the clockwork universe. In his 1605 correspondence with Herwart von Hohenburg, Keppler states, “My aim is this, to show that the celestial machine is to be likened not to a divine living thing but rather to a clockwork (horologium)...” (Matthews 2000:216). The Mechanos worldview is further defined by Bacon, Descartes, and Newton, whose works collectively form the constructs of our scientific and technological thought. As the father of modern philosophy, it is Descartes’ dualistic metaphysics that have come to define our western worldview. In Mechanos, the physical world is made up of physical substances operating according to natural causal laws which govern their behavior. We deduce these laws through observation and analysis of the component parts. Intellectual mind and physical reality are separated. The ideas of Descartes were built into modern science at its origins and their influence is hard to overestimate. However, psychology and physics also find their modern origins in Descartes, so he is often referred to as the father of modern psychology and physics as well. In the words of Descartes (1637/1986:67), humans are “masters and possessors of nature.”

The Mechanos dualistic relationship of man to natural world is amplified in the economic theories of Adam Smith and the political theory of John Locke. The 17th century English philosopher John Locke wrote, “The negation of nature is the way toward Happiness.” Locke argued that people must be “emancipated from the bonds of nature.” Locke also preached unlimited economic growth where a harmonious society depended upon the amassing of individual wealth (Locke 1688/2003). Adam Smith, the 18th century father of modern eco-
omics, believed that self interest was also of social benefit so that an individual “by pursuing his own interest, frequently promotes that of the society more effectually than when he intends to promote it” (Smith 1776/1994). The pursuit of self interest, without consequence, expanded to the scale of the industrial revolution has led to our current environmental degradation.

We summarize the Mechanos worldview as follows:

• Nature is to be dominated by humans as a divine right and resources are endless
• Growth is necessary
• Progress is amassing material abundance
• Competition is a requirement for human advancement
• Rationality, Logic, and Scientific Method are superior to Nature and Intuition

In the midst of social, political and cultural upheaval French, Italian and German artists, architects and designers of the early 20th century both embraced and were driven by the Mechanos worldview. At a time when architectural style consisted of historical repetition, the dominant theme of progressive artists and architects was to create an artistic and technological synthesis as a means to transform social order. Their ideas and ideals were expressed in a variety of manifestos that served as guide and goad to designers. Italian Futurism intended to reinvent life in response to new technologies and conceive of a new race in the form of machine-extended man. Futurism began as a literary movement created by Filippo Tommaso Marinetti in 1909, with the manifesto Le Futurisme.² His call was to create a new art that rejected the past; celebrated speed, machinery, violence, youth, and industry; and sought the modernisation and cultural rejuvenation of Italy. It attracted artists who also wrote manifestos on literature, music, dance, performance and painting. In 1914 the architect Antonio Sant’Elia, who created powerful images of machine age structures, wrote “...we – who are materially and spiritually artificial – must find that inspiration in the elements of the utterly new mechanical world we have created, and of which architecture must be the most beautiful expression, the most complete synthesis, the most efficacious integration” (Sant’Elia 2005). The French architect Le Corbusier wrote Vers Un Architecture (Toward a New Architecture 1923/2007) in which he sought to bring the ideal of mass production to a new architecture. His statement, “A house is a machine for living in.” is quintessentially Mechanos.

The German Bauhaus school which operated from 1919 to 1933 has had the greatest influence on both the built environment and art and design education. Its motto was, “art and technology – a new unity” and its principles were expressed in its famous Manifesto calling for a unity between artist and craftsman. The Bauhaus Manifesto established the philosophy and ideology of the new school: “The complete building is the ultimate aim of all the visual arts. Once the noblest function of the fine arts was to embellish buildings: they were indispensable components of great architecture. Today the arts exist in isolation.... Architects, painters, and sculptors must learn anew the composite character of the building as an entity.... The artist is an exalted craftsman. In rare moments of inspiration, transcending his conscious will, the grace of heaven may cause his work to blossom into art. But proficiency in his craft is essential to every artist. Therein lies the prime source of creative imagination” (Gropius 1919).

² An English translation of Fondazione e Manifesto del futurismo (The Foundation and Manifesto of Futurism), as well as a selection of Marinetti’s other writings, can be found in Flint and Coppotelli (1991).
The design innovations commonly associated with the Bauhaus were evidenced in radically simplified forms, rationality and functionality, and the idea that mass-production was reconcilable with the individual artistic spirit. The Bauhaus workshops were the birthplaces of new industrial designs, furniture and textile art. The exhibition department trained painters, technicians, actors, dancers, and directors. The leaders of the Bauhaus, Walter Gropius, Hannes Meyer, and Ludwig Mies van der Rohe, were architects. The Bauhaus workshop in Dessau, Germany became a steel and glass embodiment of all that the age of Mechanos represents. Its industrial age esthetic became an icon and model for architectural design for half a century. Many of 20th Century’s most recognizable names in architecture, art and design assisted in the development of the Bauhaus revolutionary curriculum including: architect Marcel Breuer; painters Wassily Kandinsky, Paul Klee, Piet Mondrian, Johannes Itten; photographer László Moholy-Nagy; sculptor and designer Oscar Schlemmer; lighting and industrial designer Christian Dell.

The enduring Bauhaus influence is in large measure due to the artistic diaspora that occurred as a result of the rise of Nazi Germany. Gropius and Breuer went to teach at the Harvard Graduate School of Design. Mies van der Rohe re-settled in Chicago at the Illinois Institute of Technology (Frampton 1992). Their students came to maturity as the pre-eminent architects of the second half of the 20th century – fully immersed in the Mechanos worldview. The material intensive, energy consumptive, steel and glass structures they designed came to be known as the International Style and have been replicated in cities all over the world.

The Current Crisis

There can be little doubt that contemporary industrial society as a result of Mechanos worldview faces an environmental crisis of enormous proportions. We have, since the Reformation—the beginning of the era of modern science—and the Industrial Revolution made enormous strides in our material welfare. At the same time we can see the costs of this progress in ecological devastation, human and social fragmentation, and spiritual impoverishment. Yet in the face of the seeming overwhelming consequences of Mechanos, there have been efforts to give warning.

M. King Hubbert was a geoscientist who worked at the Shell research lab in Houston, Texas. He made several important contributions to geology, geophysics, and petroleum geology, most notably the Hubbert peak theory with important social and political ramifications. Hubbert is most well-known for his studies on the capacities of oil fields and natural gas reserves. He predicted that the rate of petroleum production over time would resemble a bell curve. Based on his theory, he presented a paper to the 1956 meeting of the American Petroleum Institute in San Antonio, Texas, which predicted that overall petroleum production would peak in the United States between the late 1960s and the early 1970s (Hubbert 1974). At first his prediction received much criticism; however, Hubbert’s prediction proved correct in 1970. A look at a recent projection of Hubbert’s bell curve for world energy production indicates a peak between 2006 and 2010. After this time production decreases and prices are projected to rise rapidly.

The Limits to Growth, published in 1972, (Meadows et al.) modeled the consequences of a rapidly growing world population and finite resource supplies. The controversial conclusions predicted an eventual inability of resources to meet the demand of an exponentially growing population. In 2008 Graham Turner at the Commonwealth Scientific and Industrial Research

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Organisation (CSIRO) in Australia published a paper called “A Comparison of The Limits to Growth with 30 Years of Reality” (Turner 2008). It compared the past thirty years of reality with the predictions made in 1972 and found that changes in industrial production, food production and pollution are all in line with the book’s predictions of economic collapse in the 21st century.

**Toward a New World View**

A crisis can be defined as a situation where things are not working as expected. The Chinese word for crisis can be instructive here. It is composed of two characters: *wei*, meaning danger, and *qi*, meaning opportunity. We are thus reminded that while a crisis situation poses the possibility of hardship and destruction, it also focuses our attention on the prospect of making serious and profound changes to avert a disaster.

“Many writers and commentators are suggesting that the current worldview or paradigm of Western civilization is reaching the end of its useful life. It is suggested that there is a fundamental shift occurring in our understanding of the universe and our place in it, that new patterns of thought and belief are emerging that will transform our experience, our thinking and our action” (Reason 1998). The fundamentals for these changes were laid out by Henryk Skolimowski in a pioneering 10 minute address delivered in London, England at the Architectural Association in 1974. While participating in a discussion about the problems of alternative technology Skolimowski radically posited that the precepts that create technology are themselves the problem. He rejected “the damaging assumption that the world is a clock-like mechanism within which we are little cogs and wheels. It has led us to reduce everything, including human life, to the status of components of this great machine. The consequences have been disastrous” (Skolimowski 1974).

Skolimowski argued that what is needed is a fundamentally different way of thinking. “Only when we find a new metaphor and invent a new conception of the world shall we be able to stand up to the senseless, destructive forces that have swept over our lives” (1974). Echoing this view, just a few years later economist Nicolas Georgescu-Roegen warned that, “because the entropic abundance of the last two hundred years or so is rapidly approaching its end, we must reassess our approach to economic, political, and social evolution.” (Georgescu-Roegen 1980:268). The creative efforts to do so, he said, would “tie together present and future generations in an adventure without parallel in our knowledge.”

That new conception to which these pioneers pointed is sustainability. This new worldview recognizes that human civilization is an integral part of the natural world and that nature must be preserved and perpetuated if the human community itself is to survive. It is strongly influenced by the ecological study of the patterns and relationships of living systems in relation to their environment. The extension of ecological concepts to design encourages a holistic approach to the human relationship to nature, connecting communities and systems. Skolimowski attests that, “According to one tenet of ecological thought the world is a sanctuary and we should treat it as such. This assumption is the basis of a completely different outlook on the universe and our place within it. If we live in a sanctuary, then we must treat it with reverence and care” (Skolimowski 1974).

In order to implement this new worldview of sustainability we will need to engage in a sustained process of social change. “Like it or not,” Jeremy Rifkin has reminded us, “we are irrevocably headed toward a low-energy society. It is up to us whether we get there because...
we want to, because we understand both the necessity for our own survival and the vast opportunities for a better existence, or whether we try desperately to hang on to our existing worldview and finally, painfully, are forced into the future” (Rifkin 1980:250).

Making Changes

Social change is not linear; it develops in a dialectical fashion. There is a dialectic between consciousness and being, theory and praxis, and between the personal and the structural. Each of them mutually influence the other; change is not an either/or proposition, but a both/and one. We assert that there are two kinds of changes that need to occur to advance sustainability. First, there must be a change in our cultural worldview or weltanschauung. We must be able to think it in order to do it. Second, we must make changes in our institutional practices.

Institutions are sedimented practices that structure social relationships for the purpose of meeting various human needs. They incorporate mutual obligations through statuses, roles, norms, values. Because of their recursive sedimentation, the normative practices of institutions are the most constraining influence on human behavior. And by dictating important aspects of human behavior, institutions also control, to a certain extent, conscious awareness. Because institutions are the most significant and stable aspects of any society, they are the slowest aspect to change. At the same time, the only lasting changes in a society are changes in institutional practices. A new sustainable worldview, then, must be embedded in specific institutional practices.

Accordingly, then, we have developed a manifesto that attempts to codify a new sustainable worldview as well as to point to specific institutional changes necessary to implement it.

The Berlin Manifesto

Designers of the early 20th believed that social transformation could be brought about through changes in design principles and practice. Their Manifestos were statements of revolution that provided a vision for the future based on their Mechanos worldview. We believe that now is the time for designers, architects, poets and artists to create a new practice of design based on a holistic worldview based on the symbiotic relationship of man and nature. In response to the intent of 2009 Third International Conference on Design Principles and Practices we have developed The Berlin Manifesto that articulates a set of principles that can be implemented as design practices. The authors facilitated an international congregation of designers to formulate this new Manifesto. Participants represented 6 countries and 4 continents. Their occupations included architect, sociologist, ceramic designer, poet, computer scientist, environmental scientist, civil engineer, and industrial designer. With an understanding that change must occur at both the individual and institutional level the Manifesto is written in two parts.

Toward a Sustainable Worldview

We believe
1. The Earth is a finite system and is a model for design.
2. The primary responsibility of humans is universal stewardship.
3. In an ethic of being in the world instead of domination over the world.
4. That we must recognize that we are part of natural systems.
5. We must integrate ourselves into natural processes.
6. We must respect the diversity and complexity of natural systems.
7. In emulating the cyclical flow of natural systems, in which surplus is returned to the nutrient pool.
8. We must achieve a balance of resource use with the ability of systems to regenerate.
9. In relying on natural energy flows following the physics principle of least action.
10. We must minimize entropy.
11. In fostering a maximum of immaterial exchange on a global scale (ideas, know how, etc.).
12. We must strive for social equity.

**Institutional Changes for a Sustainable Society**

We call upon people of the world to make these changes by

1. Creating universal health care systems.
2. Establishing appropriate technology supply systems for food and nutrition.
3. Basing agriculture on natural systems.
4. Educating for sustainability.
5. Establishing a monetary system based on natural and human resources.
7. Developing diverse energy sources.
8. Developing resource supply systems that minimize energy use.

**Implications and Future Directions**

The Bauhaus, Futurist and other manifestos of the last century were generated from the fundament of the Mechanos worldview. The words came before there were any objects to fire the imagination of the world. Ultimately, the vision and the resultant objects became the enduring inspiration for generations of designers punctuated by two world wars and a depression. It was a vision that changed both design process and design product. It was, unfortunately, a design process that produced buildings and products that are wasteful and resource-intensive. The buildings we design touch individuals and the culture in obvious and subliminal ways. The objects we use in everyday life, designed in the image of Bauhaus, constantly and consistently reinforce the Mechanos worldview and an unsustainable future.

Like the authors of these previous manifestos, we too believe that ideas and design can change individuals and institutions. The Berlin Manifesto, generated through an international collaboration, establishes design principles for a new age. Designers must now transform design practice. It is our hope that these words will fire the designer’s imagination and obligation to effect social change. It is the sustainable transformations of the built environment and the designed object, incorporated into daily life, that will support the change of culture.
References


About the Authors

Dr. Patrick J. Ashton

I am working with Professor Matt Kubik, architect, on the connection between social issues and the built environment. Specifically, we are looking at how competing political ideologies shape different design strategies and interactions with the built environment. We taught a nationally-televised honors course that examined how modernism has created an urban built environment in the U.S. that undermines sociality and community and explored possible alternatives in new urbanism and social ecology. Recently, in connection with an exhibit of first edition famous printed works, we taught a mini-course that examined how foundational ideologies in Western thought are expressed in the built environment. I have published a
Matthew Kubik

I am an architect and Associate Professor of Interior Design at Indiana University Purdue University Fort Wayne, USA. I hold a Bachelor of Architecture Degree from the University of Notre Dame, Indiana, USA. I was one of the first graduates of the Architectural Association School of Architecture Energy Programme, London, England earning a Graduate Diploma. I also did post-graduate studies at the Royal College of Art, London, England. My design practice focuses on issues of aesthetic expression resulting from minimum energy use as a design determinant. My portfolio includes appropriate technology detailing for projects in Algeria, earth sheltered housing, and passive solar architecture. My current research with sociologist Pat Ashton is a study of cultural transformation incurred through controversial ideas from ancient through modern sources and resultant expressions in the built environment.
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