

Function Fiction Friction

the future in retrospect
1973-2003-2033

A lecture by Thanos N. Stasinopoulos
at Notre Dame University, Lebanon
27.01.2003

Time

Time in architectural studies is a rather peculiar issue: a substantial part of the curriculum is devoted to the monumental architecture of the past, and most of the rest has to do with conditions of the present.

Not much formal attention is given to the future, although that's precisely when our students will live & work. Julio Bermudez of U. of Utah remarks that "*one of the glaring ironies of modern education is that schools try to prepare students to live in a time that does not yet exist by concentrating their studies on a time that has ceased to exist.*"

Of course design involves prediction, so the future is more or less in the mind of everybody who is involved in architecture - but only as a personal perception. Up to now we think of the future like many generations did before us: something linear, something that comes slowly in a predictable manner. This perception promotes loyalty to old methods, ideas or rules; after all, education disseminates the existing concept of the world, and teaching passes current knowledge to the next generation.

Can we continue safely on that traditional road?

Unfortunately we don't live in a linear era. Many things around us change rapidly, both in quantity & quality. So, given the changes we have already witnessed, it is most likely that the future cannot be foreseen as a natural extension of the present. Still, our duty is to prepare our students for the most probable conditions they're going to encounter as professionals.

But what kind of future we could reasonably anticipate?

Contrary to the Modern Movement, the future of society and architecture is not a fashionable issue in the architectural debate of the last 20 years. So there is a rather dim area that requires some light in order to assess what we can expect next in our route. To do this we can compare our past and current positions in order to find our direction and speed; and then, we can see how to adjust our course.

Let's try to do that.

The age of Function

To start, let's go 30 years back, in **1973**.

That was the year when construction of Yamasaki's *World Trade Center* and SOM's *Chicago Sears Tower* was completed; Utzon's *Sidney Opera* opened that year too. It was the year of the introduction of the barcode, and Pink Floyd's "*Dark Side of the moon.*" 1973 was the year of Vietnam Peace Treaty in Paris; of Pinochet's coup in Chile; of Nixon saying "*I'm not a crook.*" it was the year of the Yom Kippur war and the subsequent Oil Embargo against the West.

The planet seemed to have no limits in 1973. The optimism & the visions of the beginning of 20th century were still active, guiding architecture as much as society. Architecture was still in the age of Function: Modernism was strong, boosted by the reconstruction after WW2; in fact, several Modernist big figures were still alive or had died a few years ago.

I was a student then, as several others here I presume. We were taught that '*Form Follows Function*'; that buildings are machines with a simple linear geometry. And we were learning to design for the '*affluent society*': environment was hardly of concern to most people, and it was not a significant design consideration, other than basic solar control -occasionally; machines were supposed to take care of our design blunders.

The expression 'energy crisis' was introduced only after the Oil Embargo of '73, when the price of oil went up 10-fold in less than a year. The threat posed to Western energy supplies forced governments to implement measures on energy efficiency, especially in the building sector that consumes half of the energy total. It also initiated of a large scale investment in energy-related R&D and demonstration projects on environmental sustainability. At about the same time, the public began to develop an awareness of resource depletion and the risks that pollution posed to the environment. Several architectural schools introduced courses on environmental topics and low-tech design.

The age of Fiction

In spite of such circumstances, mainstream architecture chose a very different way of addressing the future during the post-embargo years.

Two much advertised books marked a new wave of architectural polemics against Modernism: '*Complexity & Contradiction in Architecture*' by Robert Venturi and '*The Failure of Modern Architecture*' by Brent Brolin. These, among others, contributed to a sharp U-turn of architecture, coupled with social developments.

During the 80's, the conservative offensive succeeded in promoting a model for the future built on a recycled past: a 'golden' past that would be reinstated like an exiled king, enhanced by the technological and economic myth of infinite growth. Thus, the past was used to replace (or perhaps forget) the future.

The conservative success transformed the architectural scene into a glossy manifestation of the new prevailing values and priorities. Modernism was declared dead, along with its ideological comrades; Individualism triumphed over Collectivism, and Consumerist Materialism became the new faith inspiring rich and poor alike.

So, in an era increasingly dominated by the media and visual communication, reason was replaced by impressions, depth by surface, and Modernist Function was succeeded by Post-Modernist Fiction, conveyed through stylish facades. This embalmed fashion caused enthusiasm among the nouveaux riches, and soon became popular in a world of quick profit and eager for prestige, moving full speed to the future on reverse gear.

Following the social and cultural conservatism, architectural theory, education and practice focused onto harmless semiotics; major emphasis was put onto image, style, and originality for its own sake. Architecture went backwards, to

the Beaux Arts era, under the disguise of Post-Modernist off springs: Neo-Neoclassicism, Neo-Vernacular, Deconstructivism, Neo-Modernism, etc. etc.

Perhaps those composite 'post' & 'neo' names reveal attempts to create a new product by just recycling old stuff. They also highlight a striking shortage of genuine inspiration, other than the invention of ephemeral show-offs. No wonder, by late '90s many started voicing concern about '*a crisis of architectural identity*'.

Nevertheless, in the good old Beaux Arts tradition, there has been a wonderful surge in architectural creativity in 2-D. No doubt, that has been boosted by the computer revolution, which facilitates visualization; in deed, computers offer exciting new potential for creating and realizing new forms, too difficult to convey by hand.

But virtual architecture is detached from real and pressing issues. And I think the same applies to some contemporary stars of theory and practice, whose shine has marketing support, depth, and life span similar to the pop hits of our days.

Then and now

The meaning of this retrospective is to show how far we have gone during the last 3 decades:

- By 1973 pocket calculators started replacing the slide rule; the PCs of today were hardly a dream; today you can have a laptop with satellite connection to the web via your mobile phone.
- In 1973 the Cold War was going strong -and for instance North Korea was richer than South; today there is only one empire, financial globalisation is advancing like tanks in the desert, and religious fundamentalism is on the rise -east, west, and in between.

In the meantime we have learned new expressions like '*AIDS*', '*human bombs*' or '*collateral damage*', and heard of little known places like Three Mile Island, Chernobyl or Bhopal. In short, we have passed from the era of '*Make love, not war*' into the brave new world of '*Make money, AND war.*'

And many other things are different today:

- Today there are 50% more people on earth, and three times as many cars; there is progress in the so-called 'human development', especially in life expectancy and education, but still half of the population lives with less than \$2 daily.
- Today, the affluence of our youth era looks faded; in spite of the consumerist blitz, one hears about recession, shortages, crises or depletion every day: energy, water, CO₂, ozone, forests, toxic wastes, UV hazards, oil spills, famines.
- And there are additional issues that we didn't really have to face in our student years, like *tele-working*, *cyberspace*, or *globalisation*.

Given such broad developments during the previous 30 years, what kind of changes can we expect after 30 years?

There is no doubt that the key challenges we'll have to face in our profession -as in our societies- are the electronic revolution and the ecological crisis.

The first can make our lives better, if we avoid the danger of being used by Big Brothers. In less than 10 years, digital visualisation and the Internet have altered the way many of us work -and we haven't seen nothing yet. This is a very important issue for the architectural curriculum, but it's not my topic here.

So let's proceed to the second challenge, the environment. This issue is more vital, because it goes beyond the enrichment of our lives; it has to do with our fundamental root of existence, Mother Nature. And because of that paramount importance, it may drag us into an age of Friction.

Rolling to the age of Friction

I'm not so sure that the majority of architects today are really aware of the current environmental prospects of the planet and where they lead us to. However I'm convinced that my students will have to design for a different context than we did; they will have to design not for affluence, but rather for shortages. Let me show you briefly the grounds of my view.

I live in a city where environmental conditions are rather thorny. Thanks to rapid and ad hoc development, the 4 million inhabitants of Athens experience all the features of a contemporary metropolis: air pollution, traffic congestion, noise, minimal green areas, heat island, and occasionally power blackouts, heat waves, flooding or drought. It is not a pleasant situation, and it's constantly getting worse.

This is not a rare case; in fact, Athens' environment can be considered as far better than in many other large urban centres of today that keep growing at astonishing levels, especially in the developing world. For instance, Cairo or Istanbul are each populated today by more people than the entire population of Greece (10 million). More impressively, Lagos and Dacca in just 50 years have jumped from 400,000 to 13 million, and keep growing, projected to exceed 20 million after 10-15 years.

Such numbers clearly show that mankind is becoming increasingly urbanized: 50 years ago 2/3 of the global population was rural; today it's 50-50, and after 50 years 2/3 will be urban.

Urban or not, human numbers are multiplying fast: today planet Earth carries 6 billion people; that's double than 40 years ago. And the forecast is for about 9 billion after 50 years crammed on the same planet as today.

But the key issue is not just human numbers. It's the fact that the material input & output of all those living souls exert a heavy pressure on the environmental resources; a pressure that is growing at an alarming rate, thanks to the economic development & the promotion of consumerism. And since most of those billions will live in urban areas, there will be many focal points of intense environmental stress.

There is a simple relationship, the 'Ehrlich formula', describing the human impact on the environment:

$$\text{Impact} = \text{Population} \times \text{Affluence} \times \text{Technology}$$

More explicitly, environmental impact is the product of population, multiplied by average consumption per person, multiplied by the amount of resources needed or waste created by each unit of consumption.

All three factors are on the rise, leading to exponential increases in the demands placed on a finite environment. And it's becoming more and more difficult to hide the consequences of that under the carpet.

We are all familiar with the clichés of our time: energy crisis, drought, floods, ozone hole, deforestation, global warming, acid rain, greenhouse effect, desertification, etc. Data trends related to those problems are alarming, although hardly seen in headlines.

The 'energy crisis' in particular is well advertised, and for good reasons: the era of oil is expected to end in 40-50 years, with extensive domino effects in all sectors, including agriculture. Of course, long before that, the impending scarcity will escalate prices and bloody antagonisms -something we are already witnessing not far from here.

But even with abundant energy suddenly available, say from cold fusion or hydrogen, there are still other independent emergencies already on the horizon: irrigation water, soil corrosion, waste disposal, raw materials depletion, urban congestion, genetic food, etc. etc. This is serious stuff, that can take another lecture; but I should go further now.

But is the crisis real?

Nevertheless, there are some who dismiss such issues or their gravity: "Boring journalistic exaggerations" they say, or "an invention by some specialists to make a living." And they point to "the real improvements in the quality of life that surround us." Addicted to contemporary 'dolce vita' and confident about the unsinkability of the titanic 'system', they ignore the warnings about approaching icebergs.

It is true that, thanks to amazing improvements in medicine & agriculture, Malthus has been proven wrong –for the time being. It is also true that, in some parts of the world, certain social groups do quite well today. But ironically, that success may also be a grave threat.

This is not just because the high standards of living that some people enjoy are at the expense of many others. And it's not just because those less fortunate are struggling to get on the glittery train of consumerism. The most dangerous fact –for rich & poor alike- is that contemporary prosperity is based on credit.

Let me explain this last point:

Reports by several research teams show that the human 'ecological footprint' has already exceeded the size of the planet; that is, our consumption & waste production exceed the Earth's capacity to create new resources and absorb waste. Therefore we are supporting current resource use by liquidating natural capital, thus reducing the Earth's ability to sustain future life. To put it in banking terms, our account at the 'Bank of Nature' is overdrawn. Still, we are in a shopping spree that deepens our debt - and we don't have a clue on how we are going to pay back.

Do we seriously expect that we can continue on that course for too long? Do we honestly believe that today's Western affluence can be enjoyed by everybody on the planet on equal terms? Let's imagine that the 6 billion people of today living like –say- today's Californians; can we think of the energy, raw materials, or waste that such a global lifestyle would imply?

Let's remember the Ehrlich formula $I=PA^T$ for a minute: in order to control our impact on the environment we should adjust the 3 factors:

- either human numbers **P** should be reduced appropriately -whatever that means in practice;
- or the average material affluence **A** should stay low -not necessarily equally for everybody;
- or technology **T** has to make giant leaps -addressing several independent environmental fronts.

Obviously none of them is an easy task that can be accomplished overnight, keeping everybody happy. So far no serious action has been taken, other than PR conferences, where the major outcome is more light on the widening gap between rich & poor.

Nevertheless, the powerful advocates of material growth keep promoting the new faith on 'endless economic development'. And millions join the 'Monopoly' game, following their artificial desires far beyond their genuine needs, like mosquitoes attracted by the bright fire. But for how long we'll be able to sustain our consumerist addiction?

The naked emperor

The economic structure which is promoted through 'globalisation' etc. and its architectural expression depend upon never-ending growth; yet, we live in a world with finite resources. Therefore what we label as 'progress' today is built upon the denial of ecological constraints. It's a delusion that cannot last long.

That plain fact is like a "great heresy of our times," George Monbiot wrote recently in the *Guardian*, "a fundamental truth which cannot be spoken." "It is dismissed" he says "as furiously by those who possess power today -governments,

business, the media- as the discovery that the earth orbits the sun was denounced by the late mediaeval Church."

But it's not just green leftists who point to the "Emperor's new clothes" as a sham: a rising number of prestigious thinkers and institutions voice their concern and cast doubts on the environmental compatibility of dominant social structures & objectives. They might focus on different issues, but their common conclusion is that the development process that we have known during the last two centuries, is not sustainable.

For instance, the Royal Society of London and the US National Academy of Sciences, two scientific bodies of global weight, have issued joint statements in a language unusually sharp for such institutions;

- about the threats of "accelerated population growth, combined with consumption habits and particular patterns of social organization and resource management;"
- about the fact that "many renewable and non-renewable resources are being drawn down," consumed mainly by "a relatively small fraction of the world's population" which "influences the consumption patterns and aspirations of others worldwide;"
- or about the necessity "to consider what constitutes a 'decent life'," concluding that "societies need to examine their values."

Glimpses on the future

Last May another prominent organization, the United Nations, published 'Global Environmental Outlook 3', a lengthy report, compiled by a large scientific team from several countries. GEO-3 includes a detailed assessment of the current environmental status in each major region of the planet. Following that, the report projects current data & trends into the future and describes four alternative scenarios about the most likely social & environmental conditions after 30 years:

- In scenario #1, the *Market* road, the current pattern of development expands globally; after 30 years of domination by market forces, the social & environmental drawbacks exceed the benefits, and the planet is in a worse mess that today -'Plus ça change, plus c'est la même chose'.
- In #2, the *Policy* road, improvements are made through legislation, taxes, and other measures stipulated by governments; by 2032 improvements have been achieved, but at high cost and by overstretching bureaucratic powers with strict control, something like in the 1984 film 'Brazil'.
- In the *Security* road, the rich are fortified in enclaves of prosperity, law and order, surrounded by an ocean of poverty and despair; the best thing there is after 30 years, is dreams for a second Renaissance. Such a neo-medieval world was depicted in the 1973 movie 'Soylent Green'.
- Finally, in #4, the *Sustainable* road, there is a grassroots reaction against environmental & social decay; 30 years of gradual improvements give confidence for a sustainable future for everybody, including the planet.

An additional scenario might be an ecological and social crisis never seen before, one that would rapidly spin out of control. Such a crisis will not necessarily occur after a warning period with sufficient time to respond; it could well be as unexpected as a heart attack, which develops for a long time without a clue until it causes a sudden deterioration & collapse. That scenario is portrayed by two other films, the 'Planet of the apes' (1968) and '12 monkeys' (1995.)

Avoiding Friction

Whichever scenario is more far-sighted, the world after 30 years cannot be like the past or even the present one; and neither can be architecture. Let me elaborate on that.

It's not easy to accept that the depth of the ecological and social crisis leave no other way than a radical reorganization of

production & consumption in order to create a more sustainable world.

So, from the available options, we might choose the effortless one, that of passive observation while our world disintegrates, hoping that we'll be dead before the Big Bang.

And we may try to accept pollution, congestion, or Big Brothers as a way of life, pursuing the 'Holy Grail' of materialistic 'development' sheltered in our gated community.

We can also hope for a whole bunch of scientific miracles: Perhaps we might be able to find steel & fuel for all the cars of prosperous China, and even absorb their fumes. Or to irrigate Kazakhstan cotton fields with desalinated water from the Indian Ocean. Or to transfer our garbage to the moon or outer space, patch the ozone hole and dump CO₂ from the atmosphere into the oceans, re-forest the Amazon and restore soil's fertility, create multi-layer cities for millions of noiseless cars, etc. etc.

But George Orwell once said "*Facts do not disappear simply by ignoring them.*" And I would add that *Deus Ex Machina* exists in Greek tragedies only.

On the other hand, we can choose the most effective option to deal with the environmental and social threats collectively and on time; it is the 'road of sustainability' as GEO-3 calls it.

That implies a radical change of our mindset, based on a wiser technical & social interaction with nature; and it requires an active awareness by architecture too. Buildings not only consume a huge amount of resources, but also shape the patterns of our everyday lives and are our major link with the environment.

So, if architecture is to be part of the solution rather than the problem, if it is to be a guiding component of the future world and not just an elite servant, then it has to stop being a cheerful accomplice to the looting of the planet - or a voiceless witness of the escalating crisis.

Unfortunately it's a fact that most buildings are built without an architect. But still architects provide the paradigms to the rest of society, and they're also involved in planning decisions. Therefore architects have a special role to play: they should be at the forefront, providing the built space principles & models in the new sustainable path.

Of course sustainable design exists for ages, with countless examples among the vernacular architecture of the world. The traditional buildings & settlements we see today emit the beauty of an organic truth, a product of collective wisdom by many generations that mastered ways of balancing their needs & resources without today's technology. This is a topic that you seldom hear in History of Architecture classes, which deal with the grandiose monuments of the past. Nevertheless it is obvious that societies being out of synch with their environment have already had the fate of the dinosaurs.

Today, after three decades in the 'energy crisis' era, sustainable architecture expressing the rising prominence of environmental issues has made substantial technical advances. But its applications are rather inadequate and perhaps misleading, being isolated from the context of a sustainable lifestyle.

For instance,

- does it make environmental sense to live in a 'bioclimatic' villa, and drive daily to the other side of the congested city with your shiny 3,000 cc Land Rover to work at your 'energy efficient' office?
- And how 'ecological' it is to eat fresh organic vegetables flown in by jumbo jet from a faraway country?
- Similarly, how 'green' can a skyscraper be, with gardens on the top floors, when you have to pump water hundreds of meters up to support them?
- And what difference does it make when you build 10 new energy conscious buildings alongside another 100 new power hungry ones?
- As for cars, is it really enough to build more efficient engines when the sheer volume of new cars offsets by far any fuel benefits per unit?

A long list of such contradictions shows that in the long run sustainability cannot be achieved by isolated designs, by image-building gestures, or by symbolic deeds to reduce our environmental guilt. And it's not adequate if some people are trying to lessen the mess many others spread around. Real change can only be based on a widespread personal as well as social attitude.

Therefore it has to start from school.

An architecture for the future

This brings us back to the key question of this essay: what kind of education should future architects have?

The global circumstances I described earlier make it wise to engage in a serious preparation for the future. Preparation here means developing a critical understanding and approach to the issues and events that will most likely impact society, architecture and ourselves in the years ahead.

Up to now, more and more architectural schools add classes in sustainable design, energy efficiency, solar design, etc. of rather technical character. Typically such courses are elective, considered similar to topics like acoustics, materials, or prefabrication. But this is not enough, and perhaps it is a misleading approach.

You see, what we really need is not just another architectural fashion like High-Tech etc. or another building technique. A conservatory or a solar collector added to a house does not make it bioclimatic; similarly, adding fringe courses on energy efficiency does not address the wider issue of sustainability.

Instead of fragmented technical methodology, we need a holistic approach, where the natural & social environment is an integral part of the design process. In few words, we need a new way of thinking over the drawing board.

Therefore the methods, the priorities, and above all the spirit of sustainability should be infused into 'normal' design courses; it should become one of the major architectural parameters, conscious and subconscious ones, dominant and undeniable like the force of gravity.

We need design courses where the building is not viewed as just an aesthetic object with spatial relationships, symbolic references or structural features like we often do today. Instead, it should be seen as a transformation of the four basic natural elements (fire, earth, water, air) into a catalyst of individual and social life.

Students should be aware that their project is not in void or out in the woods; that a building extends beyond its actual footprint, with its materials coming from a much wider area, and its by-products affecting distant parts of the globe; that buildings are not 'nature morte' but living "*vessels of life*;" and that that built space, people, and nature are three interacting actors through time.

In fact, the essence of sustainability should go beyond building design, to the entire social structure, goals, and relationships. Anthony Brown of *Ecosa Institute* has a lot to say on this:

"Ultimately we need to educate design students not only in the technical skills essential to the practice of their profession, but also to instil an understanding of a greater goal that must eventually be shared by our whole culture - that of creating a sustainable society.

This involves such issues as equity, responsibility, ethics and philosophies that go beyond the aesthetic to provide guidance for an approach to a life of design."

And he continues:

"we have to train a whole new animal as it were, from the ground up, and examine the role of the architectural school in the process."

"Already the profession is reducing sustainability to a series of checklists that lead to a building being accepted as 'green'."

Instead, "*we must strive to move beyond the mechanics of 'green design' to a broader vision of sustainable practice that*

includes not only the technical skills but also the moral, societal skills needed to create a sustainable society.

The architect needs to be able to teach and inspire as well as design, and any curriculum must include that reality."

He also adds an interesting suggestion:

"To be a sustainable designer one must have a deep sense of what it is that we are trying to sustain. We have two things to consider: nature and human society."

Clearly, what we need is more than just passing the existing knowledge to our 'clones'. We know first hand that today is much different than when we were students; and we have every reason to believe that our students will face a world much different than today. So, our aim should not be just to transfer our own experience to those who will handle future conditions that we never had.

Back in 1973 many people, especially students, were asking 'why?'; today they ask just 'how?'. This is a critical gap that we have to address if we want to avoid being fed with pre-cooked solutions to problems that we ignore their deep causes. Therefore we need to develop in our students a critical awareness of the issues that quite probably will affect our world in the coming years.

Julio Bermudez remarks on this: *"Perhaps the most important gain in a curriculum that considers the future is the possibility to make students and teachers alike change their mind about the present. The perception of today can be significantly altered if we look at it with the eyes of tomorrow. What is a problem now may become an opportunity later. What is an asset today maybe a heavy burden tomorrow."*

So we should encourage the revision and critique of the past and the present as the best way to prepare for the future. We should seek the development of new ideas, methods and rules more relevant to the architectural and social conditions that will challenge the next generation. And above all, it is absolutely necessary to develop a new design mentality towards the environment that nourishes us.

Student should realize that architecture of all scales has a serious responsibility in shaping the physical setting of our personal as well as collective lives; and that in this venture it is vital to have nature on our side. They should also be given the motivation, the knowledge, and the skill to develop their designs into a manifestation of their awareness that we live in "a small planet."

It is our duty to convince them

- that *glossy* does not mean *beautiful*;
- that *beautiful* does not mean *practical*;
- that *practical* does not mean *sustainable*;

and, after all, that sustainability means the survival of what we call civilized human society.

■

Food for thought

If today is a typical day on planet Earth, we will lose 116 square miles of rainforest or about an acre a second.

We will lose another 72 square miles to encroaching deserts, the result of human mismanagement and overpopulation.

We will lose 40-100 species, and no one knows whether the number is 40 or 100.

Today the human population will increase by 250,000.

And today we will add 2,700 tons of CFCs to the atmosphere and 15 million tons of carbon.

Tonight the Earth will be a little hotter, its waters more acidic, and the fabric of life more threadbare.