Algorithmic Sustainable Design: The Future of Architectural Theory.

Nikos A. Salingaros
University of Texas at San Antonio

Lecture 8

A. Emergent systems.

B. Examples from artificial life.

C. Inhuman experiments.

D. Architectural education.

Preamble

- Notice that current architectural education and practice are opposite to the method presented in my lectures
- But established system is not integral with natural and biological systems
- If we want sustainability, my lectures provide the most helpful direction

A. Emergent systems

- I now apply systems theory to explain some phenomena of human society
- Systems develop new characteristics not present in the initial inputs — an instance of *emergence*
- A system of beliefs grows over time, and eventually takes over a society
- Social contagion spreads a new norm

Power as an emergent phenomenon

- Ideology and questionable beliefs lead to the emergence of a power structure
- System grows in strength and detaches itself from the rest of the world
- Becomes more and more insular
- Periodic “reform” perpetuates power structure — a staged deception

George Orwell's novel "*1984*"

- The past is erased — people are forced to live in the present
- Power is expressed by inflicting pain
- *Reality is defined only by the system*
- *There is no other truth to turn towards*
- *Totalitarian system re-writes history*

A “new” tradition emerges

- Movement based on ideas turns into an institutional power base
- Irrational ideas are transformed into established (rational!) practice
- Henceforth, the system’s goal is simply to perpetuate the existing power structure by any available means

Educational system ignores biophilia and adaptivity

- System of architectural education concentrates upon abstract forms
- Style-based design is detached from biological needs and from nature
- Design is detached from spiritual needs
- There is no integrity with humanity

Main goals for architectural education

- Should be to raise people's awareness of the effects of the built environment
- To take responsibility for one's designs
- To focus on wellbeing of inhabitants
- Not only to come up with novel shapes
- Not to become mindless pawns of a manipulative power system

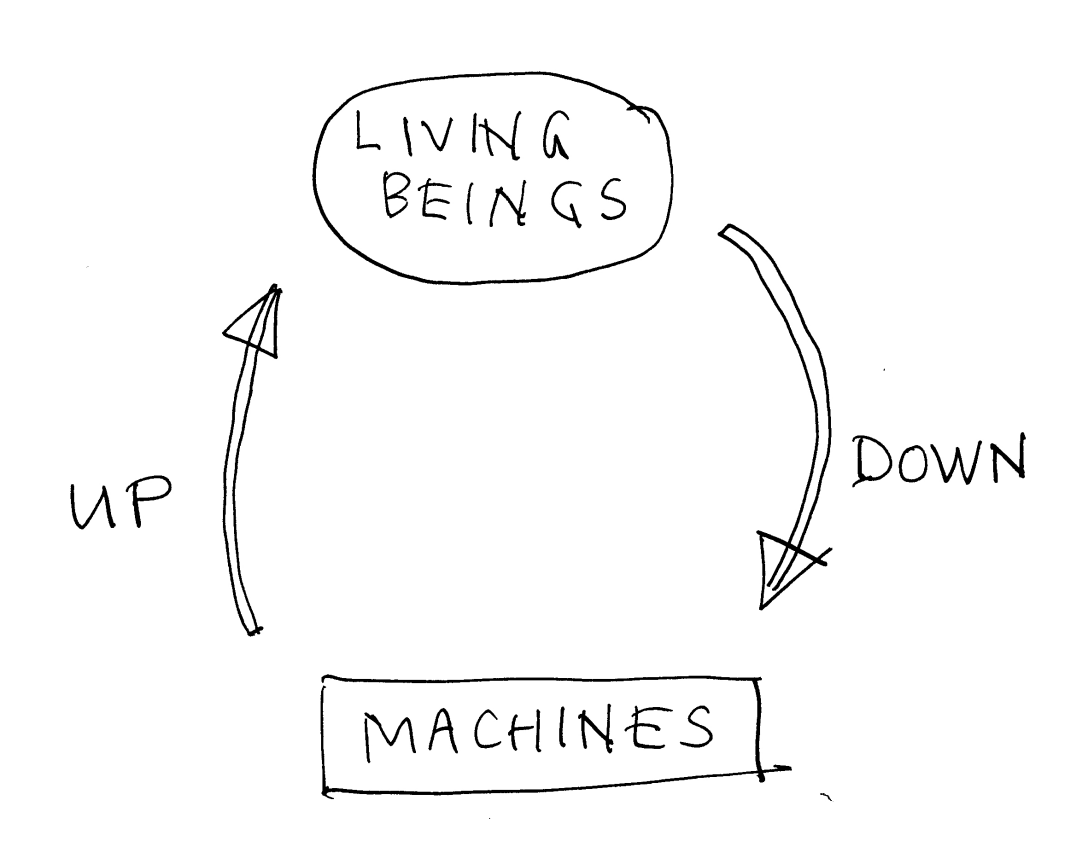
B. Artificial life

- *Innocent aspect*: pixels on a computer screen move around and gobble each other up — only a game
- *Alarming aspect*: the two-way transformation between living beings and machines — extremely serious
- This latter process has re-shaped humanity in the 20th Century

Relationship between machines and living beings

- Two possible ways to go:
- 1. UP — make machines mimic capabilities of living beings
- 2. DOWN — reduce living beings to the characteristics of machines
- Going DOWN determines the form of the 20th Century's built environment

From living being to machine



Going UP — enhance machines

- Computers enhance our capabilities
- Great successes in robotics: Rodney Brooks' Mars Explorer
- Industrial robots can work in delicate, dangerous, or repetitive conditions
- Military robots save lives — more expendable than humans

Going UP (cont.)

- Add more and more intelligent qualities to machines, so that they are able to mimic human capabilities
- Increase their perceptive mechanisms
- Increase their capacity to process information
- Increase autonomous action capability

Going DOWN — reduce beings

- Advertising brainwashes people (Le Corbusier was an advertising pioneer!)
- Manipulate people as inert entities
- Transforms human beings into mechanical consumers of industrial products
- Brainwash humans to act as suicide bombers — expendable beings

Going DOWN (cont.)

- Remove more and more intelligent qualities from humans, until they begin to act like machines
- *Decrease* perceptive mechanisms
- *Decrease* capacity for processing information
- *Decrease* autonomous action capability

Industrialization of animals

- Beings become an industrial product
- Battery-raised chickens pass all their lives crammed together in atrocious conditions
- Bred with growth hormones and genetically modified — made into unnatural monsters
- Laboratory animals used in cruel and inhumane experiments

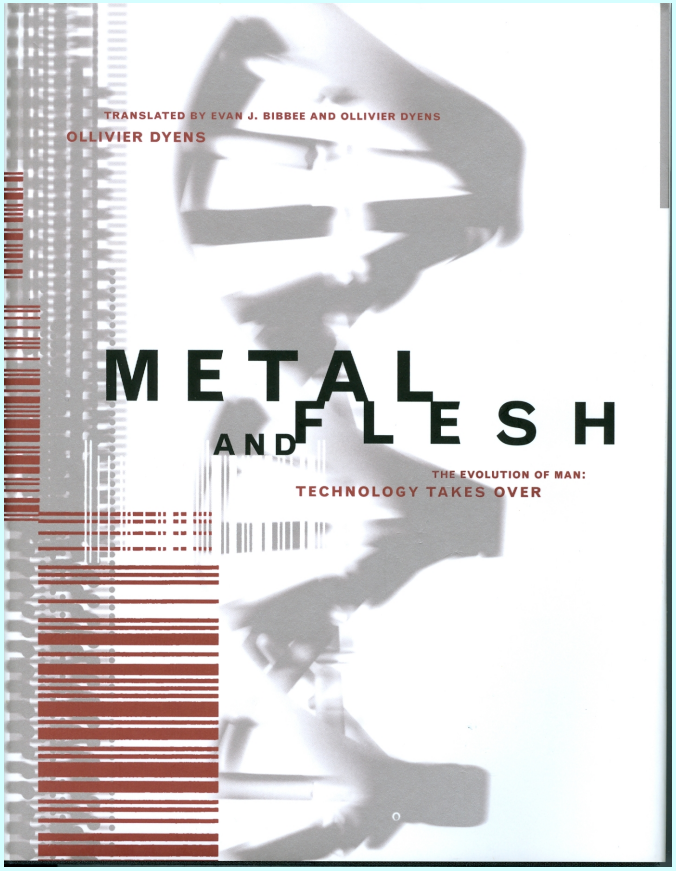
Industrialization of people

- Mass production driven by speed, volume, efficiency, cost, bottom line
- Uses workers as machines, or as simple cogs in a production machine
- ***Reduces the complex humanity of people to a single mechanistic function***

Contemporary trends

- French-Canadian philosopher and author Ollivier Dyens explores the merging of humans with machines
- — in his book "*Metal and Flesh*", MIT Press, Cambridge, 2001
- Major trend underlying all our culture
- More DOWN than UP

“*Metal and Flesh*”



Artificial life

- Was achieved in the 20th Century
- — opposite of what was expected!
- — not the elevation of machines to the level of humans, or even animals
- Instead, the reduction of animals and human beings to the level of machines

Social engineering

- Creates monsters from living beings
- Manipulates their genetic information to create unnatural new forms of life
- Seeks to fundamentally re-shape life forms so that they benefit industrial production and consumption
- Aims to fit life into a machine world

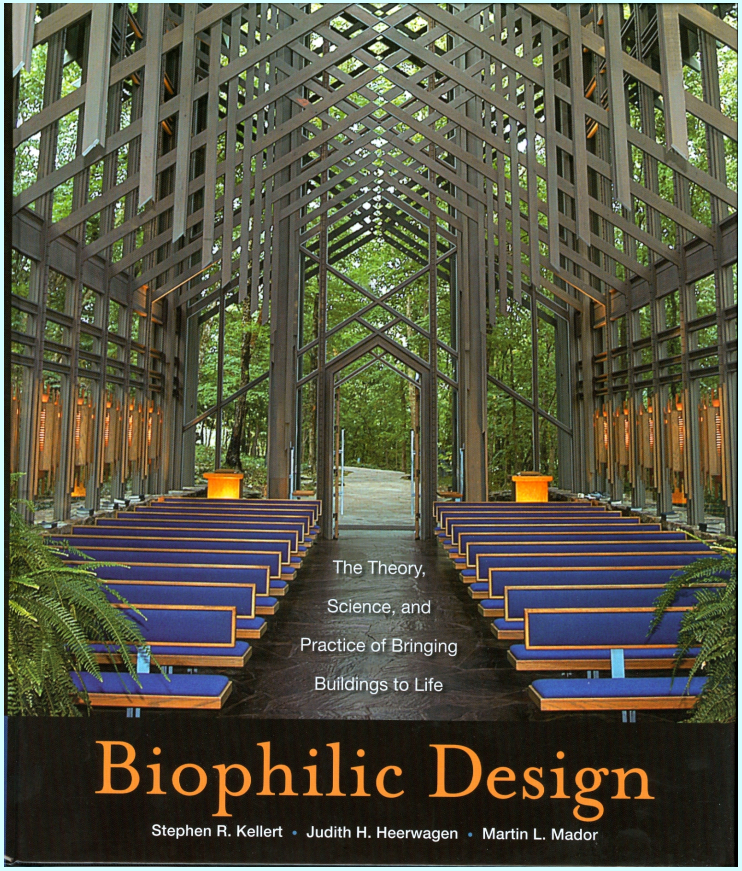
Three levels of being human

- ***3. The transcendent human being***
- ***2. The biological human being***
- ***1. The abstract (mechanical) human being***
- Most complete, most fulfilling existence moves through all three levels
- Contemporary architecture and urbanism act strictly on level 1 — misnamed "rationality"

"*Biophilic Design*"

- N.S. & Kenneth Masden: "*Neuroscience, the Natural Environment, and Building Design*"
- — Chapter 5 of "*Biophilic Design: The Theory, Science, and Practice of Bringing Buildings to Life*", Stephen Kellert, Judith Heerwagen & Martin Mador, Editors, Wiley, New York, 2008

“*Biophilic Design*”



Biophilic architecture respects human levels 2 and 3

- An architecture that focuses on human feelings and psychology
- Architecture concerned primarily with human biology and sensitivities
- Design that never imposes any formal ideas without testing their effects
- Design that rejects social engineering

Architects and industrialization

- Architects accept the “machine aesthetic” and its unnatural forms
- Architects are among the most enthusiastic supporters of technological solutions to the built environment
- But they don’t notice when certain applications of technology reduce human beings to machines

Utopia becomes dystopia

- Hopeful dream of utopia transformed into the nightmare of dystopian despair
- Already recognized by science-fiction authors, but not yet by philosophers
- Culture of architectural despair in the high-rise slums of the French cités and dystopian urban regions the world over

C. Inhuman experiments

- When human beings are degraded to machines, atrocious actions become possible, and even feasible
- Dominant idea of “progress” gets confused with inhuman pursuits
- But this is not true science, because it does not follow the scientific method

Human experiments today

- Carefully regulated by government
- First tried out on laboratory animals
- Only after effects are well understood to be safe, then tried on volunteer human subjects, not forced on people
- If there are any obvious negative signs, the experiment is discontinued

Control group is additional check

- Experiments on humans are always carried out with a control group
- Continuously compare state of subjects with those in the control group
- If any negative *statistical* effect is found as compared to the control group, experiment is terminated

Inhuman experiments

- Those that ignore established checks
- Masquerade as “scientific enquiry”
- Unconcerned with fate of the subjects
- Experimenter declares noble intention: “*to solve the problems of humanity*”
- Most often, experiments are carried out with detachment and indifference

Double standard for human experiments

- The medical industry is held to strict standards for human experimentation
- But architects and urbanists experiment freely on millions of humans without any controls or supervision
- Even with massive evidence, toxic typologies continue to be marketed

Le Corbusier

- Pseudonym of Charles-Édouard Jeanneret-Gris
- Designed inhuman environments for millions of persons without ever considering their effects on occupants
- Very creative in proposing far-ranging ideas for building and city form

Absolute self-assurance

- Le Corbusier was convinced of the absolute truth and moral value of his own inspiration
- Never questioned the correctness of his schemes, but treated them as revealed wisdom (***religious presumption***)
- Le Corbusier's ideas were never tested
- But they are applied repeatedly!

Le Corbusier's points

- 1. Architecture of the horizontal (*lecture 2*)
- 2. Anti-gravity anxiety (*lecture 2*)
- 3. Overhanging slabs (*lecture 2*)
- 4. Flat or tilted plane ceilings and roofs
- 5. Randomization of tectonic forms
- 6. Rough exterior materials for indoor surfaces — brutalist concrete

Le Corbusier's points (cont.)

- 7. Forbid ornament (taken from A. Loos)
- 8. Banish complex and natural colors
- 9. Force people into high-rise buildings
- 10. Disconnect families from nature
- 11. Disconnect children from the earth
- 12. Destroy urban space by gigantism
- 13. Erase the human scale of streets

Inhuman architecture

- Le Corbusier invented a vocabulary of forms, all of which provoke anxiety
- Used as standard design typologies
- Their brilliant effectiveness and consistency cannot be accidental
- Le Corbusier defined a “rational” world based upon psychological anxiety

Hospitals and apartment blocks

- Le Corbusier planned a hospital for Venice with no windows
- From biophilia, we know that healing environments absolutely require sunlight and views of nature
- *Unité d'Habitation* in France — extra-thin walls create terrible noise problem

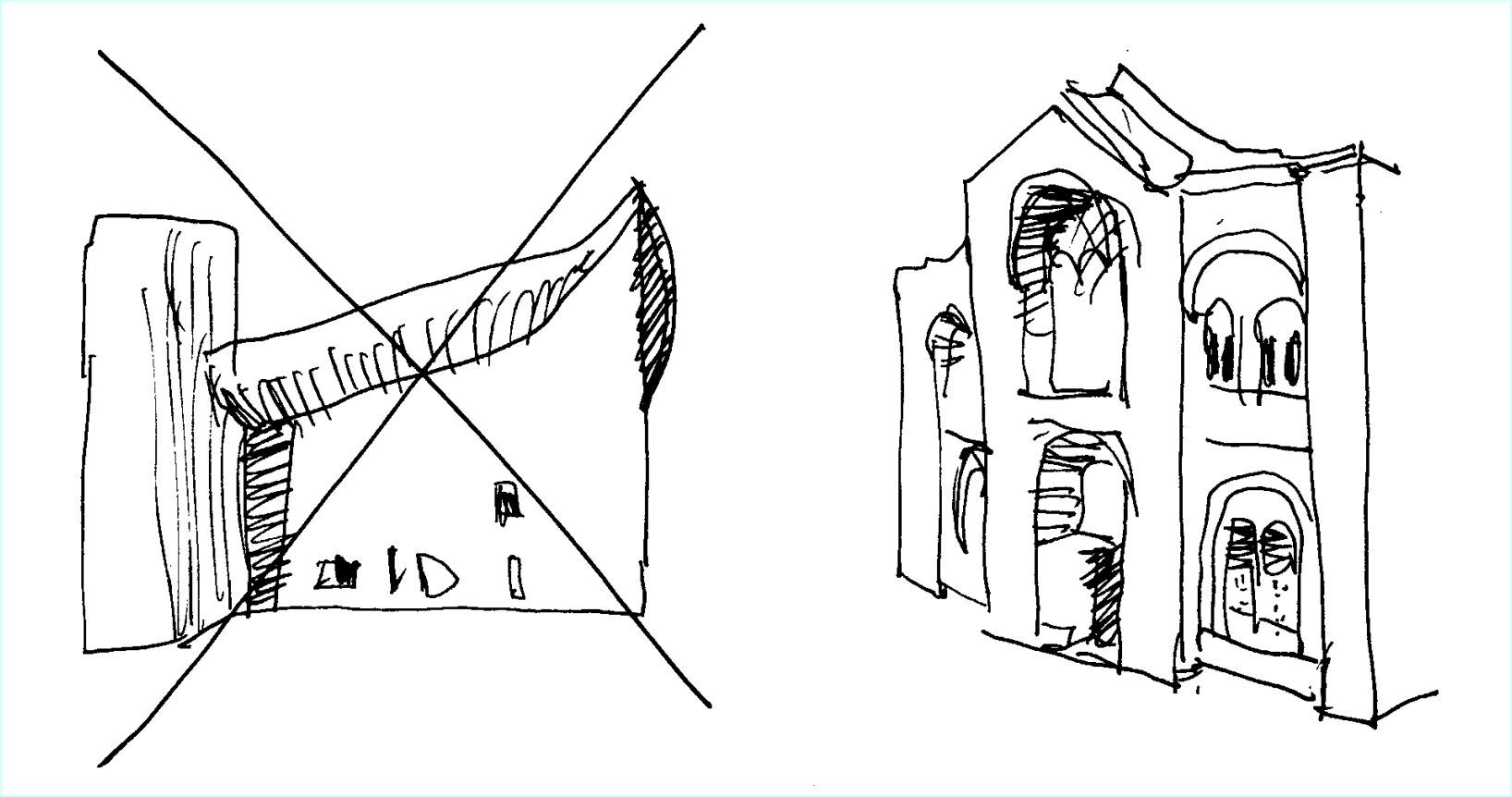
Religious architect?

- Commissioned by Father Marie-Alain Couturier, who regarded Le Corbusier as “the greatest living architect”
- 1. Convent of Sainte-Marie de la Tourette, France, 1953 (actually by Iannis Xenakis)
- 2. Chapel of Notre-Dame du Haut, Ronchamp, France, 1956
- 3. Church of Saint-Pierre de Firminy, France, completed only in 2006

Somebody forgot Moscow

- Le Corbusier eagerly participated in the competition to build the “Palace of the Soviets” in Moscow in 1931
- Project was under Josef Stalin’s personal encouragement
- Site was cleared by dynamiting the glorious “Cathedral of Christ the Savior”, a perfectly sound building

Architecture of the sacred?



“We must kill the street!”

- Le Corbusier quoted by Sybil Moholy-Nagy, “*Matrix of Man: An Illustrated History of Urban Environment*”, Praeger, New York, 1968, page 274
- Was obsessed with erasing street life and daily human interaction
- Are Le Corbusier’s ideas an expression of his psychological problems?

The fate of “Pinceau”

- Was Le Corbusier’s favorite dog
- After Pinceau died, Le Corbusier had the skin used to bind his favorite book
- He bound Cervantes’ “*Don Quixote*” in Pinceau’s fur
- Catherine de Smet, “*Le Corbusier, Architect of Books*”, Lars Müller Publishers, Baden, Switzerland, 2006

Inhuman urbanism

- Le Corbusier was pathologically obsessed with destroying traditional urban fabric
- Collaborated with the Nazi-supported Vichy regime, urging Marshall Petain to destroy Algiers during the war
- He finally convinced the post-war French occupation authority to do it

Model for urbanicide

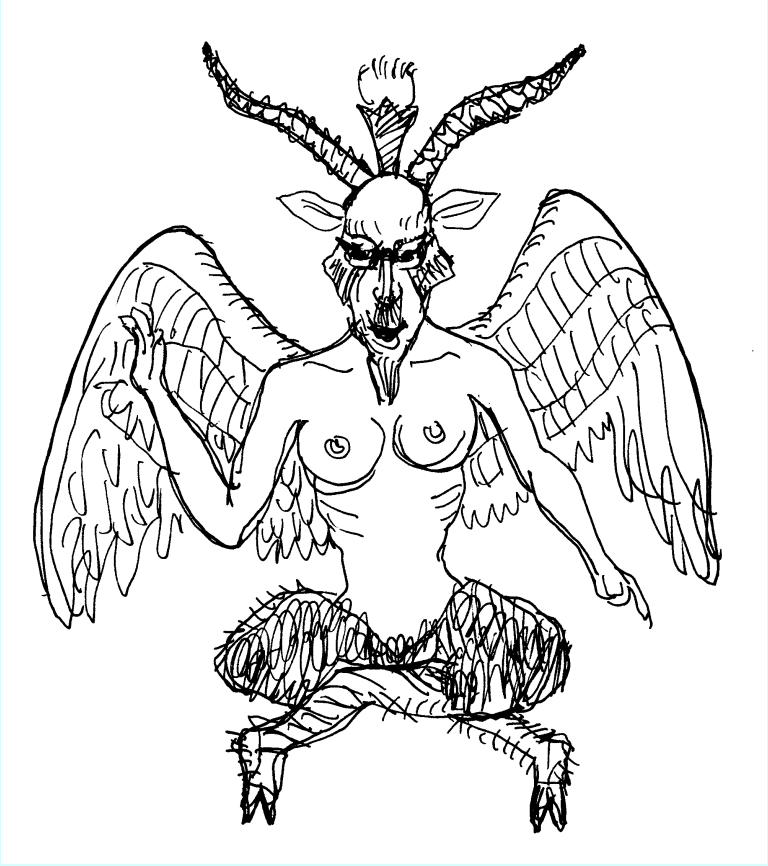
- In destroying Algiers, Le Corbusier showed a fanatical hostility against traditional Islamic urbanism
- The Arab/Islamic world noticed this, and has never forgiven the West
- Mohamed Atta wrote his thesis on the modernist urban destruction of Aleppo

The angel of urban death

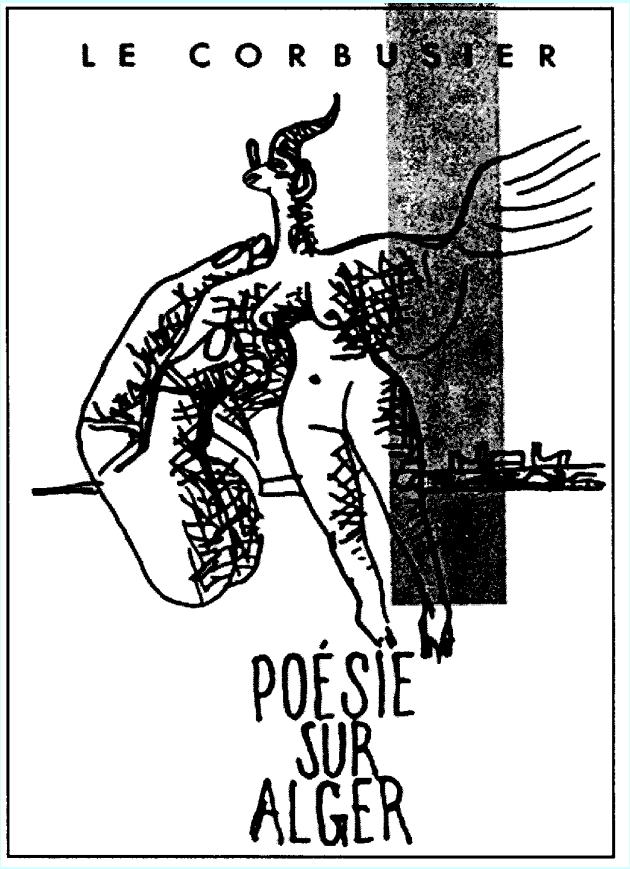
- Cover of Le Corbusier's book containing his plans for destroying Algiers has a drawing by him of the Angel of Death
- Resembles representations of Satan found in various images from different cultures throughout history

Pazuzu (Iraq, 500BC)

Satan as androgynous goat



Le Corbusier's angel of death



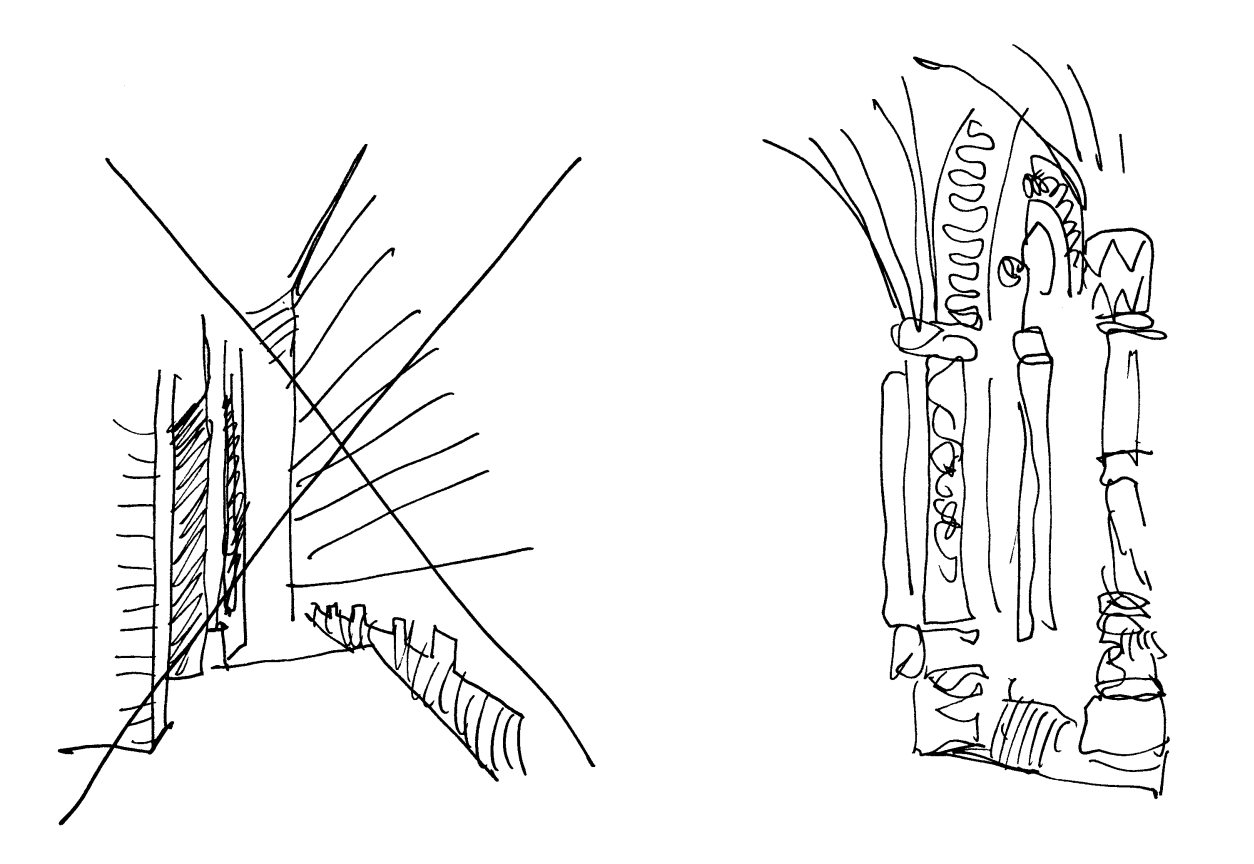
Things only got worse

- Contemporary buildings go far beyond Le Corbusier's in producing anxiety
- In the past few decades, we have seen a descent into even more inhuman architectural experiments
- Some new art museums assault the senses, causing nausea and vertigo

Novel inhuman experiments

- Extend the sensual assault of blank, forbidding concrete or glass walls
- New techniques include: blobs; oozing forms; translucent walls; curvilinear shiny metal surfaces; zigzags; spikes
- All of these tectonic typologies generate user anxiety, but no-one cares

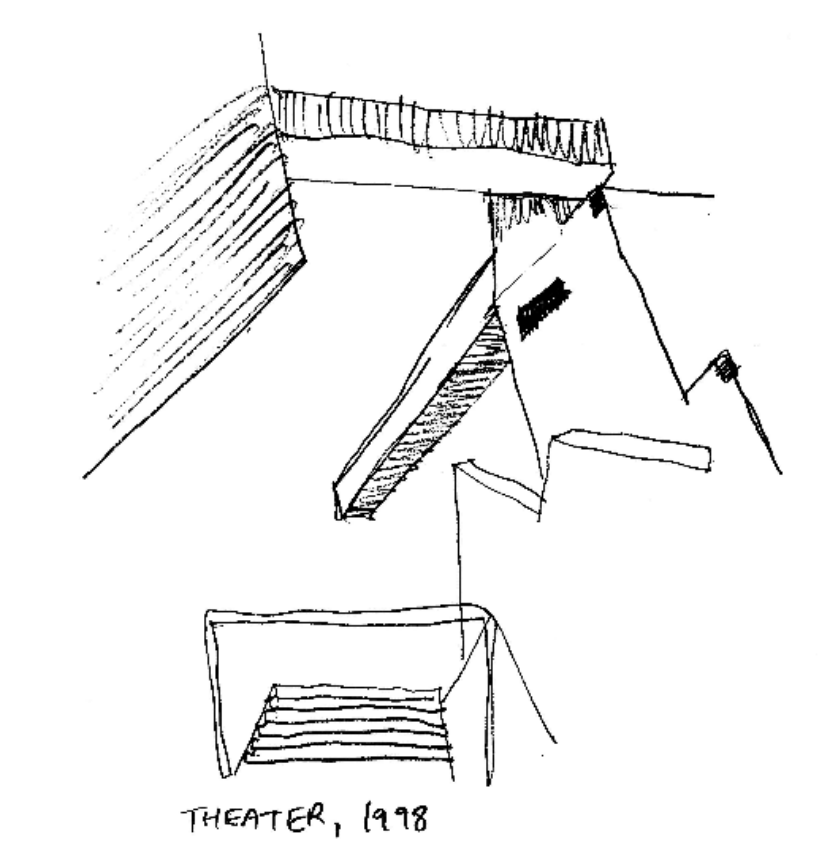
Anxiety-producing versus life-enhancing geometries



Media collusion

- Architecture critics write intelligent (but false) arguments that praise inhuman design experiments
- They use the language of technology to erase human feelings about form and place, disguising or denying the anxiety
- Convince the rest of the world to eagerly import “fashionable” designs

Mapping sadism onto built form



Market-driven pathologies

- Our consumer culture is passively masochistic in the face of media and academic authority
- Clients pay good money to live in a building that makes them ill-at-ease
- Museum-goers buy an entrance ticket to feel nauseous in an Art Museum

Global capital in the service of inhuman ideology

- Discards and erases architectural traditions the world over
- Governments often force this on their people — “*for their own good!*”
- An aggression towards humanistic traditional architectures, yet many people welcome this as “progress”

Architecture as nourishment

- Morally nourishing architecture through life-enhancing qualities of pattern, color, geometry, rhythm — ***gives satisfaction for user***
- Architecture can also bring out the darkest regions of the human soul: nihilism, schizophrenia, sadism, power — ***gives satisfaction for architect***

Stop inhuman experiments!

- Simply require the same standards as with medical human experiments
- But architects are not interested in the effects of their creations — dogma of abstract form still rules
- This development can only be market-driven, therefore educate the clients

D. Architectural education

- Why are we training our students to design buildings detached from nature?
- I wish to put back the component of integrity into architecture schools
- Re-situate in academia and the media an obligation towards human beings
- Re-orient design in a totally different direction from the spectacular image

Contemporary design

- Architecture schools now teach courses in algorithmic design — a new interest
- But algorithmic design as a purely formal approach creates monsters
- A biophilic worldview guarantees designs integral with natural systems

Inhuman algorithmic design

- Generates anxiety disguised as a celebration of novelty — the search for “playful” abstract forms
- Take “cute” results of a geometrical algorithm and use them to design an inhuman building or urban region
- No human constraints applied — biophilia, adaptivity, pattern languages

New algorithmic design (unbuilt)

Training architecture students to act without any conscience

- Architecture schools teach students to create novel forms without thinking about future inhabitants
- Promote architecture as a sculptural art never meant for human occupation
- "*Just a game*" — oblivious of the moral responsibility for their designs

Denial of human qualities validated by famous names

- Famous architects manipulate forms while ignoring living beings
- Architecture schools teach students values based upon buildings as totemic objects — without humans
- Is there an innate integrity that stops young architects from mindlessly practicing an inhuman architecture?

Philip Zimbardo

- Psychologist who undertook the "Stanford Prison Experiment" — students turned into sadistic prison guards when given authority
- Similar experiment by Stanley Milgram — students ***administered lethal electric shocks*** when ordered to do so (they didn't know the current was off!)

Question of responsibility

- Zimbardo investigated the Abu Ghraib prison scandal (Baghdad)
- His findings — ***ordinary intelligent people will commit atrocities if they believe they are following authority***
- Therefore, need to train students to accept responsibility for their designs!

“*Intelligence-Based Design*”

- Trilogy by N.S. and Kenneth Masden
- A. “*Architecture: Biological Form and Artificial Intelligence*” (2006)
- B. “*Restructuring 21st Century Architecture Through Human Intelligence*” (2007)
- C. “*Intelligence-Based Design: A Sustainable Foundation For Worldwide Architectural Education*” (2008)

New approach to architecture and education

- Uses human intelligence to design and build the most humane environments
- Utilizes the most recent scientific knowledge about human wellbeing
- Respects level 3: the spiritual level
- Introduces opposite methods from formal and image-based design

Conclusion

- Teach students why a cute design on the computer screen can become a monster when actually built
- Their responsibility to learn techniques for evaluating the effects their designs will have on human beings
- Design integrity: moral and natural