Facultad de Arquitectura, Universidad de San Carlos
GUATEMALA, September 2012
David Grierson “How do we begin again?”
Architecture & Ecology
New Masters Course (2013/14)
Partnership between the University of Strathclyde Glasgow & the Cosanti Foundation, Arizona, USA
\[ P = 7,000,000,000 + (2012) \]

\[ P = 9,000,000,000 + (2030) \]
Numbers

• 40 billion metric tonnes of CO2 (actual 36 in 2012)
• Estimated 27 billion tons (2030)
• USA t 5 billion (2012)/ per capita 19.78
• Guatemala t 11 million (2012)/per capita 0.9 (increase of 78% since 1996)
• Kenya t 11 million (2012)/per capita 0.3
• Target per capita by 2030 0.33
• My own is more than 8 metric tonnes per year
Why is this important?
Water Polo in Calcutta, 2007
Drought in India: a well in Gujarat, 2003
Child Poverty in Kenya, China and Scotland
Riots against Austerity Measures in Athens
In some parts of the world buildings account for 50% of all CO2 emissions.
Buildings are half of the problem. What is the other half?
Crisis of the Spirit
The problem is of hypocrisy
I could design zero carbon buildings but my lifestyle is not ‘sustainable’ so I’m only responding to half the problem
Not a call for abundance but for austerity (not more...but less)
Not a confrontation with others but with myself
To meet target I need to reduce my own emissions dramatically
I need to change
But how?
In search of an alternative
April 1970 – First Earth Day Protest, NY
Elizabeth Mock “The Architecture of Bridges”, 1948
Paolo Soleri, born 1919
Artistica Ceramica Solimene

Ceramica Artistica Solimene, Vietra sul Mare, 1958

Dr. David Grierson, University of Strathclyde, Glasgow
Free forming soft cities.

VISIONARY CITIES: THE ARCOLOGY OF PAOLO SOLERI

e: paolo

e: paolo

e: paolo

AESTHETIC

genesis

phencial
reflective
noosy

arcology
arcology
arcology

arcology
arcology
arcology

arcology
arcology
arcology

mesa 3
mesa 2
mesa 4

SERIES

DIMENSIONAL

mineral

gaseous

extend

unpremise

3d jersey

Babel, Canyon, Hexahedron, Novanoah

CONTINGENT

LEARNING

GAME

Cosmic Potentials

vegetal

evolutionary

Evolutionary
Workshops at Cosanti, early 1970s
Babel IIB

Population: 520,000
Density: 662/ha; 238/acre
Height: 1,260 meters
Diameter of structure: 3,360 meters
Surface covered: 778 hectares; 1,920 acres

Scale: 1:10,000
“The natural landscape is not the apt frame for the complex life of society. Man must make the metropolitan landscape in his own image...The only realistic dimension toward a physically free community of man is toward the construction of truly three-dimensional cities.”

Soleri 1969

arcology model

• An arcology (architecture + ecology) takes the place of the natural landscape by constituting a new kind of topography (a “neonature”) that:-
  • is a complex, miniaturized, multi-level configuration
  • recognises the need for the radical re-organisation of urban sprawl into dense, integrated, compact three-dimensional urban structures
  • contains all the elements that make the physical life of the city possible

• pre-figures the possibility of the energy city by promoting material recycling, waste reduction and the use of renewable energy sources as viable components in a coherent sustainable strategy aimed at reducing the environmental impact of the entire urban system
generations

The development of the arcology concept

• **Mesa City Project** (1958 - 67) - theoretical regional plan for two million people on a 55,000 acre isolated, pre-flattened desert plateau
• **First generation arcologies** (1969) - published in *City in the Image of Man*. Thirty structures designed for different environmental contexts (oceans, deserts, mountains and canyons) and varying in size, shape and form
• **Second generation** (1975) - The *Two Suns* (or “energy city”) concept. Structures split in half exposing the core to the sun
• **Third generation** (1980) - Habitats for shifting populations
• **Fourth generation** (1984) - *Space for Peace*

“The most common mistake about my work is the assumption that years of introspection have produced a take it or leave it package...rather I am proposing a methodology and at the same time trying to illustrate it.”

Soleri 1981
Thirty arcologies were designed from 1963 - 69.

Consisted of 2 groups - ‘free-form’ Dionysian & the simple geometry of Apollonian

**Hexahedron plan**

- Population: 170,000
- Density: 2,964/hectare
- Height: 1,100 metres
- Side: 1 kilometre

**Comparative densities (1969)**

- Mexico City: 22/hectare
- Paris: 264/hectare

**Hexahedron model**
Climate Zone, Air Dam, India Village, Maryland and Regina form of the urban structure including south-facing greenhouses - designed to maximise use of solar energy & reduce dependence on external energy sources.

Energy city

Two Suns (in response to the growing energy crisis of the mid-70s) described related architectural effects which collectively (within the “urban effect”) offer a response to many of today’s environmental problems:

• THE GREENHOUSE EFFECT
• THE HORTICULTURAL EFFECT
• THE APSE EFFECT
• THE CHIMNEY EFFECT
• THE HEAT SINK EFFECT
early 80s - package the combined effects of 2G into modular and standardised structures designed to respond to environmental, climatic, technological and social change

third generation

Valetta Spring Complex

*Apse form* became the generating structure as a passive solar device. It has inherent strength, envelopes space and becomes the anchoring element for shading/sheltering membranes attached via a tensile mechanism. By adapting the space and function of the prototype the structure could be adapted to serve human population shifts of various kinds including:

- MIGRATION - OLD TO NEW SETTLEMENTS
- MIGRATION CAUSED BY CLIMATIC CHANGES
- POLITICAL REFUGEES
- THE COLONISATION OF SPACE
Space for Peace proposed a series of space cities or colonies (with names like Euclidean, Urbis et Orbis, Ovum II and In Orbit) as testing grounds for the eventual “urbanisation of space”.

• Theoretical attempt to examine the rules of complexity and miniaturization and predict what some of the characteristics of space habitats might be
• Addressed notions of confinement, introspection, loneliness, defining a balanced ecology, and self-reliance within a hostile environment
• Show how asteroids of different sizes and types, once “captured” could be processed into small, simple, habitats functioning as centres of:
  • MINING, PROCESSING AND SHIPPING
  • URBAN (environmental & social) EXPERIMENTS
  • LEISURE FOR SPACE TRAVELLERS
The Future of Man

Teilhard de Chardin

Author of The Phenomenon of Man
For further information, please call Arcosanti @ (928)632-6217
A place to think, to build, to ask why?
1) Green
2) Mobility & Integration
3) Social Integration
4) The Presence of Technology

Edward Paes, Mayor Rio de Janiero
Paolo Soleri, aged 92
“How do we begin again?”