LOOKING BACK / LOOKING FORWARD:
Catholic intellectual culture, sustainability and the necessity of traditional building and campus design

Truth revealed by God

Truth discovered through reason

RENEWING THE CAMPUS: SUSTAINABILITY AND THE CATHOLIC UNIVERSITY
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Bruges, Belgium / chartered 1128

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The Catholic Worldview / Catholic Metaphysics

- The World / Creation is real

- The World / Creation is good (albeit fallen and in need of redemption)

- The World / Creation is intelligible, and can be known truly

- The World / Creation is teleological, moving toward its end, who is God

- The World / Creation is “sacramentally charged,” providing arenas, occasions and means for God’s presence therein
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Themes of Catholic Social Teaching

• The dignity of the human person
• Concern for the common good
• The human being as social animal and moral agent
• Communal solidarity
• Subsidiarity in political authority
• Environmental stewardship
• Attention to the effect of policies upon the poor
Thomas Aquinas College, Santa Paula, California – (quasi) monastic

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Georgetown University, Washington DC (urban)

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University of Notre Dame (monastic-to-urban?)
The MEASURE of good urbanism: the 1/2 mile (10-minute) walk

Historic Centers of pre-modern European cities at same scale (circles represent ½ mile diameter)
Post-1945 sprawl: scale of typical shopping zone development (circles represent ½ mile diameter)
Dartmouth College / Hanover, NH: “Vox clamantis in deserto….,”

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Traditional-construction bearing-wall / pitched roof buildings: *left to themselves* (but don’t), Notre Dame’s “God Quad” (and oldest) buildings will last the longest

Modern-construction curtain-wall / flat-roof buildings: *maintained*, Notre Dame’s “Mod Quad” buildings will require more frequent renovation and repair
Brownson Hall (left) and Main Building (right) – two traditional bearing wall Notre Dame buildings
1800-year-old stair covered by 1800-year old brick vault at Hadrian’s Villa at Tivoli (near Rome)
New modern construction at Notre Dame (perhaps LEED certifiable)
New traditional bearing wall construction:
The Danforth University Center, Washington University, St. Louis -- a building “to last for 200 years”
GOING GREEN

Green products are available for every aspect of life—even from Saks Fifth Avenue.
GOING TO A GREEN COLLEGE

68% of students say they would value having information about a college's commitment to the environment.

26% of students said such information would "very much" impact their decision to apply to or attend the school.

www.princetonreview.com  www.greenreportcard.org
SOME CONTEXT

In the United States alone, buildings account for:

- 72% of electricity consumption,
- 39% of energy use,
- 38% of all carbon dioxide (CO2) emissions,
  
  Environmental Information Administration (2008). EIA Annual Energy Outlook

- 40% of raw materials use,
  
  Worldwatch Institute

- 30% of waste output
  
  (136 million tons annually)
  

- 14% of potable water consumption.
  
What is “embodied energy” in buildings?

1. initial embodied energy, and
2. recurring embodied energy

Initial embodied energy refers to the non-renewable energy consumed in
- acquiring raw materials
- their processing, manufacture, and transportation to the site
- the construction of the building
Direct Energy refers to the energy expended to bring building materials to a site and to construct the building itself; i.e., it concerns the proximate source of the building materials and the methods used for assembling them on site. For example: in South Bend, Italian marble requires more direct energy than Indiana limestone; and assembling a steel frame building with a crane requires more direct energy than laying up a solid masonry wall by hand.
Indirect Energy is the energy used in the processing and manufacture of the materials themselves, including the cost of transporting their components from their point of origin in their raw state to their place of manufacture.

The closer the finished material is to its natural state as taken from the earth—aggregate, straw bale, stone, lumber, brick—the lower its indirect embodied energy; and

The more complicated a material’s manufacturing process—e.g., for plywood, fiberglass insulation, steel, linoleum, aluminum—the higher its indirect embodied energy.
Related to indirect energy, *recurring embodied energy* represents the non-renewable energy consumed to maintain, repair, restore or replace materials, components or systems over the life of the building; i.e., it is directly related to the durability of a building’s materials and how frequently a building requires renovation. **In other words:** the use of non-durable building materials requires later expenditures of embodied energy.
REALITY OF WASTE

If we tear down one typical building in a North American downtown – 25 ft. wide and 100 or 120 or 140 ft. deep – we have wiped out the entire environmental benefit from the last 2,688,000 aluminum cans that were recycled.

Donovan Rypkema, National Trust for Historic Preservation
REality of Waste

Demolishing a 50,000 sq. ft. commercial building produces on average 40 tons of debris…the equivalent of 250 box cars—a train 2 miles long—headed for the landfill.

Replacing it is equivalent to the carbon release of driving 2.8 million miles.
LEED: THE INTENT

• To create a national standard for green buildings
• To meet pent-up demand for reliable information with a rigorous rating system and a checklist

The Fitzpatrick Center at Duke University
LEED: CRITICISMS OF THE SYSTEM

- Simply a marketing tool
- Misleading
- Clumsy
- Bureaucratic Red Tape
- Expensive
- Equivalency of Credits
- No Proof--Based only on paperwork
- LEED-Washing
  1) Not Following Through
  2) Valuing Gizmos Over Appropriate Design
  3) Laughably Inappropriate Use
  4) Wretched Excess.
THE WIDE RANGE OF LEED CERTIFICATION

First LEED certified parking garage--Santa Monica, 2008

Right: A LEED certified 15,000 square foot home in Manalapan Beach, Florida
Adding a bike rack can earn as much credit as reusing an existing building according to the LEED rating system.
LEED BUILDINGS

LEED gold certified Lory Student Center, Colorado State University (Photo: Michael Kinsley)
LEED BUILDINGS

Washington University, St. Louis: The Danforth University Center
LEED Gold & Winner of the 2009 Palladio Award from Traditional Building Magazine
Both are considered “Green”, but will they both last? What is the lifespan of each building? 40 years? 200 years?
GREEN BUILDING IS NOT SUSTAINABLE DEVELOPMENT

The HSBC Headquarters, newly LEED Gold Certified, and an aerial view of its site.
GREEN BUILDING IS NOT SUSTAINABLE DEVELOPMENT
Green accessories might include solar panels, green roofs, bike racks or wind turbines.
GREEN BUILDING

Left: Sustainability through traditional forms and materials.
Green Building: Walls

Load-bearing construction
~ gravitational forms of nature vs. structural sealants.
GREEN BUILDING: OPENINGS
GREEN BUILDING: ROOFS

Shedding water vs. collecting water
Drawing courtesy of Leon Krier
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MIT Sues Famed Architect Frank Gehry

BOSTON (Nov. 6) - The Massachusetts Institute of Technology is suing renowned architect Frank Gehry, alleging there are serious design flaws in the Stata Center, a building celebrated for its unconventional walls and radical angles.

The school alleges the center, completed in spring 2004, has persistent leaks, drainage problems and mold growing on its brick exterior. It says accumulations of snow and ice have fallen dangerously from window boxes and other areas of its roofs, blocking emergency exits and causing damage.

Photo Gallery: Frank Gehry Buildings
The Denver Art Museum by “STARchitect” Daniel Liebeskind opened in 2003. After only 5 years, a complete roof replacement was required. A cost of $60 million.

What do you know? It snows in Denver…
FLEXIBILITY & ADAPTABILITY FOR ENDURABILITY

Originally the University Library, now Bond Hall, Notre Dame’s School of Architecture (photo courtesy of Sandy Sorlien)
New College, Oxford
At right: The dining hall, originally completed in 1386 by Bishop William of Wykeham, is the oldest surviving college hall at Oxford.
COMMUNITY: IDENTITY, PRIDE AND HOPE

Notre Dame’s Main Building (photo courtesy of Sandy Sorlien)
Notre Dame campus (left) / historic center of Florence (center) / historic center of Bruges (right) - all at same scale
Learning Traditional Construction / American College of the Building Arts – masonry & timber framing

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