Architecture 101
Bio-Architecture

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Sir D’Arcy Wentworth Thompson (1860-1948)  
On Growth and Form, 1917
How does architecture relate to nature?
Temple of Poseidon (Temple of Hera II)
Paestum, Italy
ca. 460 BC
Mies van der Rohe
Edith Farnsworth House, 1951.
Plano, Illinois

Photographer: Jack Boucher,
Historic American Building Survey
But more commonly, architects have related to nature by emulating forms of nature, in both structure and in ornament.
Biophilic - General
Nature as part of building design, nature incorporated as part of constructed environments

Heikkinen-Komonen Architects
Finnish Embassy
Washington, D.C.
biophilia design strategies
biophilic
biomimetic
biomorphomic
bio-materials
engineered bio-materials
Biophilic - General
Nature as part of building design, nature incorporated as part of constructed environments

Biomimetic Design
Design inspired by concepts, structures + patterns from nature

Biomorphic Design
Design following morphological + structural principles from nature

Bio-materials
Design using bio-materials; for example: colonized plant materials

Engineered Bio-Materials
Design using bio-materials altered or reproduced by humans
Antoni Gaudi
Church of Sagrada Familia, 1882-1926
Barcelona
Antoni Gaudi
Church of Sagrada Familia, 1882-1926
Barcelona
Antoni Gaudi
Church of Sagrada Familia, 1882-1926
Barcelona
Antoni Gaudi
Casa Mila, apartment building, 1905-1907
Barcelona
Antoni Gaudi
Casa Mila, apartment building, 1905-1907
Barcelona
Antoni Gaudi
Casa Mila, apartment building, 1905-1907
Barcelona
Antoni Gaudi
Casa Mila, apartment building, 1905-1907
Barcelona
Antoni Gaudi
Casa Batlo
Barcelona
Antoni Gaudi
Casa Batlo
Barcelona
Antoni Gaudi
Casa Batlo
Barcelona
Antoni Gaudi
Casa Batlo
Barcelona
Louis Sullivan
Schlesinger & Mayer Department Store, 1899
Chicago
Louis Sullivan
Schlesinger & Mayer Department Store
Chicago
Louis Sullivan
Schlesinger & Mayer Department Store, 1899
Chicago
Louis Sullivan
Schlesinger & Mayer Department Store, 1899
Chicago
Louis Sullivan
Wainwright Building, 1891
Saint Louis
Frank Lloyd Wright
Johnson Wax, 1936-39, 1944-50
Racine, Wisconsin
Frank Lloyd Wright
Johnson Wax Building
Racine, Wisconsin

Photographer: Ezra Stoller
Frank Lloyd Wright
Solomon R. Guggenheim Museum
New York, New York

Photographer: Carol M. Highsmith
Eero Saarinen and Associates
TWA Terminal, 1956-62.
New York

Photographer: Ezra Stoller
Eero Saarinen and Associates
TWA Terminal
New York

Photographer: Ezra Stoller
Eero Saarinen and Associates
TWA Terminal
New York
Photographer: Ezra Stoller
Contemporary Bio-Architecture
ornament

Foliated Trellis by Kent Bloomer
Ronald Reagan National Airport
Washington, D.C.

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Peter Zumthor
St. Benedict Chapel
Switzerland
Jean Nouvel
Jean Nouvel
Arab World Institute, 1987
Paris

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Jean Nouvel
Institute du Monde Arabe | Arab World Institute, 1987
Paris
Jean Nouvel
Arab World Institute, 1987
Paris
© flickr/b00nj
Jean Nouvel
Torre Agbar, 2005.
Barcelona
Jean Nouvel
Torre Agbar, 2005. Barcelona
Jean Nouvel
Torre Agbar, 2005.
Barcelona

Antoni Gaudi
Casa Batlo
Barcelona
Jean Nouvel
Proposal, Le Louvre Abu Dhabi
Racine, Wisconsin
Jean Nouvel
Proposal, Le Louvre Abu Dhabi
United Arab Emirates
Jean Nouvel
Proposal, Le Louvre Abu Dhabi
United Arab Emirates
Jean Nouvel
Proposal, MOMA Tower
New York, New York
Thom Mayne

mimicry of organic process: cutting
Thom Mayne, Morphosis
41 Cooper Square, 2009
New York, New York

Sketch by Thom Mayne
Thom Mayne, Morphosis
41 Cooper Square, 2009
New York, New York
Thom Mayne, Morphosis
41 Cooper Square, 2009
New York, New York
Santiago Calatrava
Santiago Calatrava
Tenerife Auditorium
Santiago Calatrava
Tenerife Auditorium
Santiago Calatrava
Oviedo, Spain
Santiago Calatrava
Oviedo, Spain
Santiago Calatrava
Bridge
Ondarroa, Bizkaia, Spain
Santiago Calatrava
Santiago Calatrava
Buenos Aires, Argentina
Santiago Calatrava
Orient Station
Lisbon, Portugal
Gehry + Partners
Gehry Partners, LLC
Nationale-Nederladen, 1996. Prague
Gehry Partners, LLC
Nationale-Nederladen, 1996.
Prague
Gehry Partners, LLC
Walt Disney Concert Hall, 2003.
Los Angeles

Randall Stout Architects, Inc.
Taubman Museum of Art, 2008
Roanoke, Virginia

Photo credit: Eric Brady/The Roanoke via Associated Press
Herzog + de Meuron
structure + ornament
Herzog + de Mueron with Ai Weiwei
2008 Olympic Stadium
Beijing

Photo credit: WikiCommons
Peter Cook + Colin Fournier
Kunsthaus Graz, 2003
Graz, Austria
Peter Cook + Colin Fournier
Kunsthaus Graz, 2003
Graz, Austria
Paul Andreu
National Grand Theater of China, 2007
Beijing
Paul Andreu
Opera Jinan
Jinan, China

Sketch by Paul Andreu
Paul Andreu
Opera Jinan, 2013
Jinan, China
Paul Andreu
Opera Jinan, 2013
Jinan, China
Greg Lynn
in collaboration
Greg Lynn
Alessi Supple Cups
Greg Lynn in collaboration with Foreign Office Architects, UN Studio, Reiser + Umemoto Architects, Kevin Kennon Architects and Imaginary Forces, Proposal for rebuilding the World Trade Center Site, 2002
Greg Lynn in collaboration with UN Studio, Kevin Kennon Architects and Imaginary Forces, Proposal, European Central Bank, 2005
Frankfurt, Germany
Zaha Hadid
Zaha Hadid
Proposed, Museum of Mediterranean History: “Reggium Waterfront”
Reggio di Calabria, Italy
Where I Go, Ruth Connell, oil on canvas, 2012
the end