

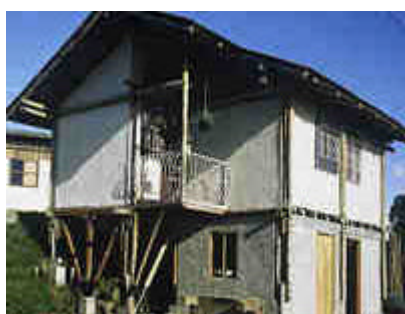
Modern bamboo architecture

introduction



It is a fact that literature about bamboo in modern architecture is hard to find. At this time bamboo is just used as a forming and constructive element. Bamboo was introduced to Europe through some sporadic organizations and trial projects.

In regions where bamboo is domestic, it was not just integrated in culture but even in architecture. The logical conclusion is that architects of these regions are more interested in presenting the qualities of this material to



Bamboo has the image of being the building material of the poorer class. For example, in Colombia the upper class especially prefers concrete. In India the highest caste builds with stone, the middle castes use wood and only the lowest castes use bamboo.

The material bamboo is not standardized so people in Europe are confronted with difficulties, if they want to build with bamboo.



joint by Renzo Piano

[picture](#)

Nevertheless some famous architects and engineers already made their experiments with this natural product. The qualities of bamboo are also appreciated by Renzo Piano. He was interested in combining light metal elements [tubes /slabs] with bamboo. In this way there arise intersections between bamboo- and modern light metal- constructions, Arata Isozaki, Buckminster Fuller und Frei Otto.

modern bamboo- architects

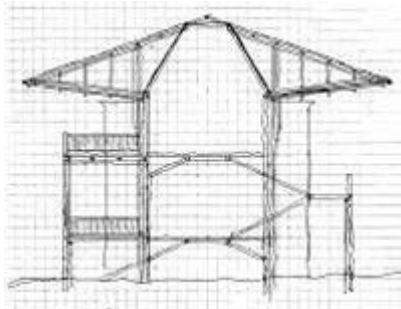
Simón Vélez



Tower in the Parque de la Cafetera in Montenegro/Colombia. Vélez/Villegas (1993) height= 19m

Vélez is a graduate architect, from the University of Colombia in Bogotá. He was born in Manizales/ Colombia in 1949 and has completed over 100 projects using concrete, bamboo (*Guadua Angustifolia*), mangrove wood, woven palm mat lathing (or expanded metal lath) and clay roof tile.

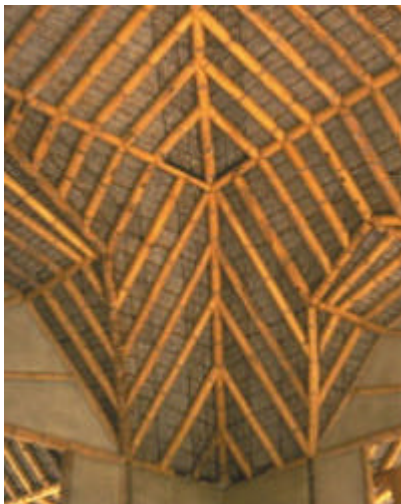
Simón Vélez works from Bogotá, Colombia, South America. As much of his work has been in very rural areas for ranchers, he has been allowed to experiment with the locally available materials due to a lack of a regulatory authority and the relative difficulty of importing the standard building materials of brick and mortar.



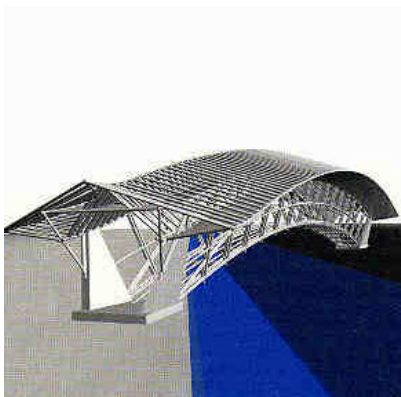
sketch for a tower

Vélez has developed a very interesting model for building experimental structures. He builds only with his own well-trained crew of workers, so he is able to constantly draw upon past successes and failures in detailing. He intentionally keeps drawings simple, usually freehand on single sheets of 8x11 graph paper. CAD-drawings only are made for the purchaser or for building improvements.

The clearest concept to be seen in his drawings is the necessity for balance. These cantilevers are very large, but maintain an obvious center of gravity over the support.



The main mistake some architects do is to use bamboo like wood. His efforts are trials, because he always tries to plan with respecting bamboo and its peculiarities.



bridge for the "Bob Marley Museum" in Jamaica

Very often bamboo only was tested on compression, but the real quality exists in its capability to compensate shear tension. Vélez used this in his framework constructions, which were able to cantilever more than 9 meters and to strain about 27 meters.



1998 Simón Vélez took part in a summer-workshop in Boisbuchet/France which was arranged by the Vitra Design Museum and the Center Georges Pompidou. At this opportunity he realized his first project in Europe - a garden pavilion.



One year later he set up a prototype of a 'low-cost-house', which could be built by the inhabitants.



The building is extremely resistant to earthquakes and is based on bamboo and loam. It has 60 square meters divided on two floors and the value in Columbia is about 5000\$.



Most of his buildings served to create a good image of bamboo even in higher social class of Columbia. This may be the way to integrate and establish bamboo next to concrete, steel, wood and stone as a full building material.

factory hall in Pennsylvania,
Colombia [1993]

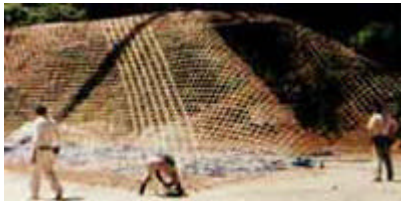




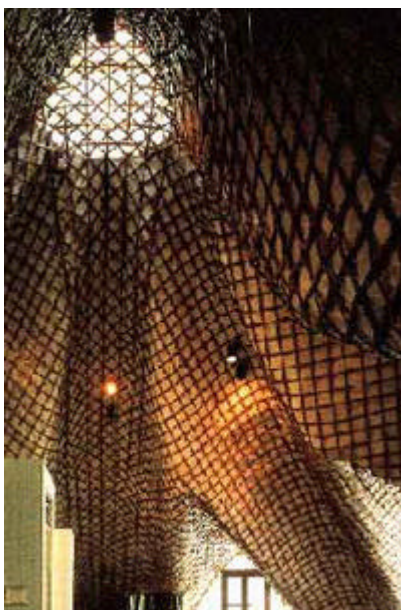
Shoei Yoh



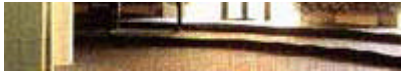
Shoei Yoh was born in 1940 in Kumamoto-City/Japan.1970 he founded his office 'ShoeiYohArchitects' .In his long career he won many architecture prizes and at this time he teaches at the 'Graduate School of Keio University'.



In two projects he used bamboo as main static structure. He also designed a geodesic cupola [1989].



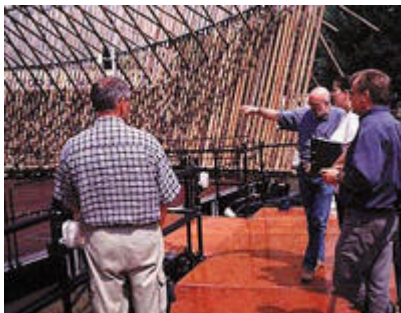
He also attended with 'grating- shell construction' .In Chikuhō-Fukuoka he was inspired by the local artisans.



Rocco Yim



The "Festival of Vision" in summer 2000 connects the cities Berlin and Hong Kong, while both are in a time of change and reorientation. The 'House of Cultures of the World' demonstrates in this context the important attitude contemporary art made in Hong Kong.



In this context the pavilion of the architect Rocco Yim from Hong Kong was distinguished in front of the 'House of the Cultures of the World' in a lake.



Bamboo on the one hand has an essential meaning for his static structure for high buildings, on the other hand for temporary stages or Chinese festivals.

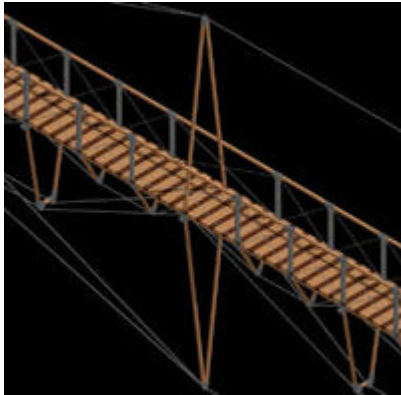
Michael McDonough



Michael McDonough is an architect and furniture designer, who discovered bamboo some years ago. Since that time he attended with the possibilities of this material.



After some furniture designs he wanted to realize his project 'Mendocino high-tech Bamboo Bridge' in 2000. This should be a demonstration of the constructive qualities of bamboo. This framework construction is able to strain over 33 meters and is also able to compensate more than 60 times its own weight. The static structure is based on the principle of 'tensegrity' which was coined by Buckminster Fuller and Robert Le Ricolais.



"The word 'tensegrity' is an invention: a contraction of 'tensional integrity.' Tensegrity describes a structural-relationship principle in which structural shape is guaranteed by the finitely closed, comprehensively continuous, tensional behaviors of the system and not by the discontinuous and exclusively local compressional member behaviors. Tensegrity provides the ability to yield increasingly without ultimately breaking or coming asunder ("Synergetics", by R. Buckminster Fuller)

Darrel DeBoer



DeBoer: Peralta Community Gardening Berkeley/ California

The architect Darrel DeBoer lives in Alameda/ California. He was inspired the buildings of Simon Velez. During the time he worked at different book and he arranged the moving exhibition with the topic 'resource-efficient building components'. Furthermore he is responsible for the straw-bale-project.

Timothy Ivory



Timothy Ivory is the Director of Design for BambooFurniture.com and trained originally as a theatrical designer at the University of Michigan and New York University, receiving his MA in Design from University of Michigan. He also studied Pantomime with Marcel Marceau's mentor, Etienne Decroux and the L'Ecole de Cirque Nationale de Paris.



He is now designing and building original pieces by commission and developing a line of Bamboo furniture. His past work has included creating theatrical environments mixing six foot masks on bamboo poles with fabric wings, staging performance pieces mixing circus, theatre and bamboo sculpture and creating temporary or transitional structures to educate about the benefits of building with bamboo as a green/sustainable material.



In 1995 he created a Bamboo Pool Bar and also a Massage Spa Shade Structure using Tonkin Cane Bamboo at the Delano Hotel. He also designed and built a pool house using Guaduas Angustifolia from Colombia.

research

Oscar Hidalgo

Oscar Hidalgo, also a Colombian architect, was born in a bamboo house in Chinchina. He is focused on research and science, but he also realized several bamboo projects. He traveled to Asia, Costa Rica and Brazil for his professional work.

Jules Janssen



model house by Jules Janssen in Costa Rica

Dr. Jules J.A. Janssen is a well-known expert in the field of bamboo as a building and engineering material. He has been keynote speaker on several congresses, and has acted as a member of steering committees, chairman of several sessions, and referee of papers submitted for congresses. Further, he has acted as member of committees for Ph.D. studies at several Universities and has been the supervisor of the National Bamboo Project in Costa Rica from 1987 till 1995.

temporary bamboo- architecture

BAMBUCO



The structure used eight tonnes of bamboo cantilevered from the parabolic arch of a footbridge over the Yarra River.

BAMBUCO is the group of artists and climbers brought together by Artist Director Simon Barley to create unique aerial performance construction events. Simon has been designing performance space and building site specific installations for some years, with an emphasis on exploration of aerial space.

Study of bamboo construction followed from an interest in lightweight structures. After research in SE Asia and a period as a trainee scaffolder at Kowloon Bay CITA, Hong Kong, he collaborated with the contemporary dance company Danceworks to produce the giant bamboo installation BRIDGE for the Melbourne International Festival 1995.

[letter.htm](#)



The crowds gathering to watch the builders at work confirmed the idea of construction as a performance event.

BAMBUCO has a core artistic and management group based in Melbourne, Australia. Construction crews are drawn from many countries.

Construction involves techniques adapted from modern rock climbing - although the work appears dangerous, attention to safety at height is given the highest priority. Once on site they add to this a sense of humor in several languages and a willingness to engage with the audience.

bridge in Berlin





"The intention is always upward, the imagery muscular, architectural."

commercial architecture



Project in cooperation of the Bamboo center Germany and the company PROFAIR:
Pavilion of the Company JAPAN TELECOM, Geneva



tent of the group:
"soft structures"
pylons as bundle supports



product by the Dutch group FLEXIMAC:
two bamboo- supports as pylons for bent awnings. Because of the double curve of the membrane the surface in tension is stable

land art

Hiroshi Teshigahara



The Japanese artist Teshigahara uses bamboo- ledges to make landscap sculptures



landscape- installations from bent bamboo- blades

Antoon Versteegde



This sculpture was made in cooperation of the Environmental Bamboo Foundation, the trust De Lutteluin and the artist Anton Versteegde. It wa installed within a touring exhibition at different sites.

European Bamboo Society,
Falmouth (GB)



Bamboo Arena, Riehl 1996 (G)

".....Meanwhile classical standards have become obstacles for lively arts. artist only can recover his liberty by temporary installations, by the design of vulnerable objects, that pass like organic time bombs or are destroyed by vandalism. A dynamic work of art only becomes alive outside the museum..." (Antoon Versteegde)

[picture](#)



Tower, Feesttuig 1992

Stephen Glassman



Stephen Glassman is an American artist who develops among others the free form structural bamboo siteworks. This bridge was calculated by Oscar Hidalgo. It was installed in Ubud/ Bali 1995.

[picture](#)

ecological orientated architecture



This project by the engineers and designers Darren Port and Mark Robert unites bamboo with straw-bale architecture.



This building in Puerto Rico is called "hooch" by the owner. The bamboo- construction is put up on an existing concrete base with cesstank and is used like a bedroom. sun- collectors on the roof produce current for a ventilator and a small lamp.

architects/ engineers/ specialists

architects and designers

- ⌘ Prof. Cassandra Adams; Prof. at UC Berkeley specialized in construction, mainly in environment and Japanese construction
- ⌘ Jorge Arcila, Marizales - South America - "stacked house"
- ⌘ Darrel DeBoer, California
- ⌘ Doug La Barre; USA, manufacturing facility for creating laminated lumber from imported Guada
- ⌘ Bobby Manoso, Philippines
- ⌘ [Michael McDonough](#)
- ⌘ Carlos Vegara; Cali - South America (deceased) - whole houses from bamboo, multi column system, loads carried by septum of the bamboo
- ⌘ Simón Vélez, South America
- ⌘ Marcelo Villegas, South America
- ⌘ Rocco Yim, Asia
- ⌘ Shoei Yoh, Asia
- ⌘ ...

specialists

- ⌘ Karl Bareis
- ⌘ Wolfgang Eberts
- ⌘ Prof. Jules A. Janssen
- ⌘ Oscar Hidalgo
- ⌘ ...

artists

- ≈ Anton Versteegde
- ≈ Teshigahara
- ≈ ...

literature

Vitra Design Museum, Grow your own house ...

...

Url

(http://europa.eu.int/comm/dg10/culture/program-2000_en.html on 08.02.2000, 22:00)

[straw bale- architecture](#)

[Mendocino Bridge by McDonough](#)

[Shoei Yoh - 'grating shell construction' in photos](#)

[construction principles of the whire by Anton Versteegde](#)

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