



**...AND OTHER
TALES OF CONSTRUCTION HISTORY**

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Brick by Brick and Other Tales of Construction History

December 4, 2020 at noon CST

Paolo Vitti

Origins of Brick Vaulted Construction in the Mediterranean Region and Evolution through Roman, Byzantine and Arabic Times

Fire-brick vaulting is one of the most widespread techniques for vaulting. Bricks were an ideal material for achieving light and highly performant vaults, as the ones in Hagia Sophia in Istanbul, S. Maria del Fiore in Florence, St. Peter in Rome or the tile-vaults built by Guastavino.

In the US. Brick-vaults can be formed by bricks placed radially, on-edge or horizontally. Depending on the bonding agent, different techniques were developed. Ancient Romans employed only lime mortar to form radial-brick and pitched/vertical-brick vaults. Examples in Italy and Greece will be discussed. In the Middle-East the dry climate conditions and abundance of gypsum made it possible to develop different vaulting techniques based on the use of gypsum mortar. Examples dating to the 1st-12th centuries CE will be discussed. The talk will be closed with the first tile-vault so far discovered, dating to the early 12th century and located in Marrakech.

BIO

Paolo Vitti is a practicing architect and historian of architecture. His research spans from Antiquity to the middle ages. As a professional he has worked for the preservation and enhancement of important cultural heritage sites as well as for the design of new buildings and exhibitions. He is visiting professor at the

University of Notre Dame, School of architecture - Rome Global Gateway. His book on Roman Construction in the Peloponnese has received two major awards. He is author of over 70 articles on restoration, museology, history of architecture and ancient construction. He is particularly interested in the use of traditional building techniques and their relationship with sustainable architecture. His design work is centered on the use of tile-vault construction.

Consultant for the United Nations Development Program for restoration work in Cyprus and Palestine (since 2010). He has been part of the international experts committee for the Charter for the Restoration of Byzantine heritage monuments (Thessaloniki Charter, 2018).

Since 2018 he is Board Member of Europa Nostra, the pan European association for Cultural Heritage. He has been invited lecturer at the University of London, British School of Rome, Humboldt University in Berlin, Princeton University, Pennsylvania University, University of Texas in Austin, Technical University of Athens, University of Padua, Italian Archaeological School of Athens, Sapienza University of Rome, Aristotle University of Thessaloniki, amongst the others.

Visiting Professor, University of Notre Dame, Rome Global Gateway

For Further Study

Lynne Lancaster and Paolo Vitti have written several articles on the topic (see Academia.edu)

Rebecca Kennedy

Shifts in the Productive Landscape: Traditional Construction in Oaxaca Mexico and its Relationship to Broader Land Use Patterns

Building a home with traditional methods often required knowledge of not just construction techniques but of the greater landscape and how to harvest and refine raw materials. In the southern Mexican state of Oaxaca, any traditional builder had a basic ecological knowledge including surrounding soil types, plant species, and stewardship practices that allowed those materials to proliferate. Builders knew where the best species of plants for construction were located, when they were ready for harvest, and how to process them effectively given the resources at hand.

While some rural Oaxacans still remember how to build and harvest with traditional techniques, predominant construction types have shifted massively in the last century to a concrete-only building culture. These material and cultural changes have been accompanied by - and in turn impacted - changes in land use patterns as well as perceptions of the surrounding landscape. As traditional building materials fall out of favor, the land-use infrastructure that produced them becomes obsolete, which perpetuates their disappearance by creating tangible impacts on the physical fabric of a landscape.

BIO

Rebecca is a recent graduate from the University of Texas at Austin where she received a Masters of Architecture. Her research at UT and during a subsequent Fulbright research appointment has focused on the traditional construction techniques found in Oaxaca, Mexico. Her background in construction and community-based design has led her to an interest in the intersections of building techniques and social systems.

Independent Scholar
Architectural Historian at HHM Inc.

For Further Study

Kennedy, Rebecca. "Traditional Construction Techniques in Oaxaca, Mexico: Rural domestic architecture as part of a greater building culture." *Construction History* 35 No. 1 (2020): 135-154.

Prieto, Valeria and Miguel A. Corso. *Vivienda Campesina en México*. México: SAHOP, 1978.

Kouri, Emilio. "Sobre la propiedad comunal de los pueblos: De la Reforma a la Revolución." *Historia Mexicana* (246) 66, no. 4 (Apr-June 2017): 1,923-1,960.

Rapoport, Amos. *House Form and Culture*. Englewood Cliffs, N.J.: Prentice-Hall, 1969.

Oliver, Paul. *Built to Meet Needs: Cultural Issues in Vernacular Architecture*. Oxford: Architectural Press, 2006.

WALKER, ALEX. "Historical Influences on the Use of Cement in Mexican Domestic Construction." *Construction History* 16 (2000): 87-98.

Kevin Griebenow

Block by Block, A Short History of Masonry and Concrete Dams

Masonry walls are one of the oldest and easiest ways to build structures. We have learned over time that to improve the likelihood that a masonry wall will not fall. Likewise, we have been building dams to store or alter river flows since at least 3000 BC, many like masonry walls. First built in 1500 BC, the Marib dam in Yemen is a superb example of a masonry "wall" dam reaching a height of over 60 feet.

A dam can be described as a water retaining surface with the remainder of the structure supporting this surface. Initially, the designers and builders of dams depended on its overwhelming mass to support and resist the hydrostatic load, i.e. a gravity dam. The determination of the necessary mass for a gravity dam was initially based on experience, followed by geometric and then stability analysis. The stability of a gravity dam is compared to a masonry wall in terms of the role of thrust, the middle third, and preventing tension.

The first structural dams (arch, multi-arch and slab and buttress) were constructed based on experience. Driven in part to be more economical, structural dams required a more detailed understanding and analysis for their forms to withstand the hydrostatic loading. Examples of these dam structures, some constructed in the nineteenth century, show the evolution of the design and construction developed by early civil and structural engineers. This history shows a small part of the evolution of "state of the art", along with that this history of progression should not be considered irrelevant, but maybe necessary to remind us assumptions in the design process.

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Upcoming Spring 2021 Webinar

Metals Through Time and Other Tales of Construction History
February TBA

Tait Johnson, PhD

Machines for Selling: Kawneer Products in Commercial Districts

Sara E. Wermiel

Introduction of the Rolled I-beam in the U.S.A. in the 1850s

Kevin Vazquez, PE

Dunwoody College of Technology Renovation – Minneapolis, MN.