Chapter 2

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ABSTRACT
This chapter is going to deal with the evolution of structural systems; traditional structural systems, modern structural systems and more than traditional approach to the structural systems. Beyond this, even though this chapter is related with structural systems as an integral part of architectural design, it is also going to explore the link between culture, traditional structural techniques, and influence of culture, cultural beliefs and local materials, natural constraints as local available materials, climate effects and disaster risks as drivers affecting the evolution of structural systems. Structural principles of traditional construction techniques will be analyzed. The link between modern buildings and their structural systems and traditional construction techniques will be discussed by tracing modern buildings and structural systems in terms of their evolution. The subject matter will be approached in a descriptive manner. The examples given will be used to trace the link between past and present as a way of associating cultural effect with the architectural uniqueness.

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INTRODUCTION

From Caves to Skyscrapers

Thirty thousand years ago, people roamed from place to place hunting animals and looking for wild plants to eat. As they were always moving, they did not build houses. They slept under the stars, got wet under the rain, sweated under the sun and cooked their meals over open wood fires. Much later on, the early humans began to put up shelters, tents made of animal skins and tried to protect themselves from the weather. … A few more thousands of years went by and about ten thousand years ago people slowly began to learn a new way of getting food. … Humankind had discovered agriculture. … once they found ways of staying in one place, they started thinking about building shelters that were larger, stronger and more comfortable… (Mario Salvadori, 1990)

The history of structural systems in architecture is as old as human history. Even early humans attempted to make a shelter to ensure their safety and to live in more comfortable conditions. The first examples of shelters were simple structures such as caves, tents, and houses constructed from stone or wooden logs, adobe blocks, and so forth where the basic materials were local ones and formation of the shelter was based on cultural traditions. Even though materials used were similar for different geographies and were materials that could be found locally and easily such as natural creations (caves), wood, stone, mud, straw, leaves and so forth, the aesthetic part like ornaments, paintings, colors used, and compositions were quite different, a fact which led to unique architectural creations. At this point, the effect of culture on the architectural and structural formation is obvious; whenever humans are involved, even if identical tools and materials used are the same, differences in process and cultural preferences always create diversity; this is called architectural creativity.

There are many distinctive styles of traditional construction techniques around the globe that could be defined as ancestors of modern structural systems. In common, all traditional constructions are based on stone, wood, adobe, brick, mud, and mortar. Traditional constructions and techniques are basically affected by the local conditions which are predetermined and constant such as material properties, geographical position, soil condition, natural exposures and risks such as earthquakes, floods, and climate effects; the way of expression which makes architecture unique is shaped by community traditions and beliefs which constitute the culture itself. Deplazes (2010) states that an expression of architecture is dependent not only on the materials used but also on its constructional composition. The evolution of construction system is influenced by past and present cultural traditions because of the fact that culture itself has a living character by its tangible and intangible aspects.
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