

Prolegomena: The Evolution of Water Supply Throughout the Millennia

Since the dawn of humankind on Earth, the adequacy of available water has been of utmost importance for survival and prosperity. Assurance of an adequate supply of water to an ever growing and developing population of today is a world-wide problem. Water scarcity has become a major global concern, with a major part of the world facing water shortages. Rapid population growth with the resulting change in demographics has become the world's greatest problem associated with water resources. Cities around the world have been experiencing water shortages and scarcity coupled with water quality problems. This situation is expected to worsen due to the population growth and relocation to urban areas, particularly in the developing countries. The effects of climatic variability exacerbate the problem even further, particularly when water management practices are poor. Even areas with an abundance of available water are recognising water supply as a natural resource superior to all others.

There have been a great deal of unresolved problems related to the management principles, such as the decentralisation of the processes, the cost effectiveness, the durability of the water projects, and sustainability issues. In the developing parts of the world, such problems have been intensified to an unprecedented degree. Moreover, new problems have arisen such as the contamination of surface- and ground-water. The intensification of unresolved problems has led societies to revisit the past and to reinvestigate the successful past achievements. To their surprise, those who attempted this retrospect, based on archaeological, historical, and technical evidence were impressed by two things: the similarity of principles with those of the present, and the advanced level of water engineering and management practices.

Technological advancements related to water during the 20th century created a disdain for the past achievements. Many have felt the achievements of the past are not solutions for the present and the future. Past water technologies, were regarded to be far behind those of the present. However, many of those technologies developed in ancient times could be solutions for many parts of the world. Many of the technologies developed during the Bronze Age could be considered in today's development and management plans.

Many of our present water technological principles have a foundation dating back three to four thousand years ago. These achievements include technologies such as dams, wells, cisterns, aqueducts, baths, recreational structures, and even water reuse. These hydraulic works also reflect technical and scientific knowledge, which for instance allowed the construction of tunnels from two openings and the transportation of water both by open channels and closed conduits under pressure. Certainly, technological developments were driven by the necessities for efficient use of natural resources in order to make civilizations more resistant to destructive natural elements and to improve the standards of life. With respect to the latter, certain civilizations developed an advanced, comfortable and hygienic lifestyle, as manifested from public and private bathrooms and flushing toilets, which can only be compared to our modern facilities which were re-established in Europe and North America at the beginning of the last century.

The Evolution of Water Supply Throughout the Millennia examines some of the major achievements in nearly all scientific fields of water supply technologies and management by ancient civilizations. This Book provides valuable insights into the ancient water supply technologies with apparent characteristics of their durability, their adaptability to the environment, and their sustainability. A comparison of the water technological developments in several civilizations is also undertaken. These technologies are the underpinning of modern achievements in water engineering and management practices. It is the best proof that "*the past is the key for the future.*" The ancient technologies and water management practices will be a useful tool for future cities' planning.

Thirty-six authors from several disciplines developed the chapters in this book. The disciplines include archaeology, water sciences, engineering, life sciences, environmental sciences, health sciences, biology and geosciences. The geographical coverage is very wide, with prominence in the Mediterranean world. However, several other civilizations from other parts of the world, such as Asia (Iran, China) and America (south-western United States, Mexico, South America) are included. The book is organized in four parts. The first four chapters are introductory and refer to general subjects. The next 11 chapters refer to different civilizations over the globe. The next five chapters deal with major cities with long histories. In the last chapter, conclusions and lessons learned are included. The themes of the chapters included are from prehistoric to medieval and even modern times.

Publication of a book of this scope and magnitude could be accomplished only with the help of many people, and our appreciation is gratefully offered to the authors of the 21 chapters. Their contribution to the quality of this book is evident. Also, the editors would like to express their gratitude to IWA Publishing and to Dr. Maggie Smith of IWA, for her patience and understanding, and her valuable managerial advice. We sincerely appreciate the work of 20 reviewers, who provided valuable assistance and authoritative guidance for each of the chapters which were reviewed by at least two reviewers.

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