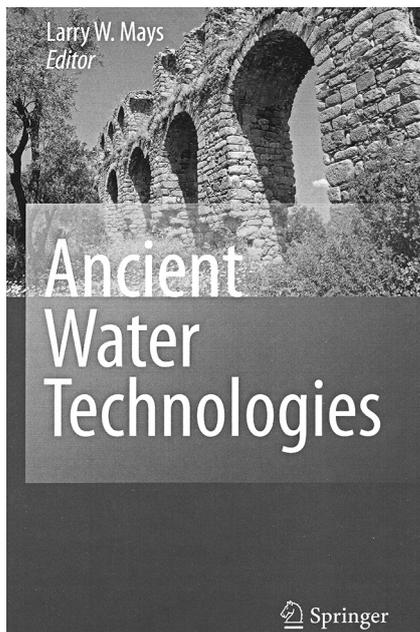


Ancient Water Technologies, by Larry W. Mays (Ed.), 2010. Springer, Dordrecht/Heidelberg/London/New York. 280 pages. Hardback: price \$159.99, ISBN 978-90-481-8631-0; paperback: price \$149.99, ISBN 978-94-007-9336-1.



Water and water infrastructure have been of prime importance to civilisation from the early days of agriculture and in the oldest cities all over the world. In our modern times of immense technological progress, water still is a rare commodity in many regions. A lot of infrastructure has been developed up to the present day, despite the fact that in many cases we still substantially draw on solutions from ancient times. In my opinion, the present tome offers both a review of the historical development of water technologies as well as an opportunity to realise the extent to which ancient technology is still applied today, albeit in an altered form.

Years of experience on the editor's part are guarantee for the high quality of this publication (comprising 11 chapters), and the extensive team of authors ensures its comprehensiveness. The first chapter introduces the subject of water technology in antiquity. The next chapters (2–4, 6, 7 and 9–11) discuss water technology across a range of regions

and with regard to different aspects, e.g., for societies of Europe, Egypt, Syria and Mesoamerica. A number of case studies fill the pages of chapters 5 and 8.

The present book comprises a broad scope of technical data on water engineering (chapters 6 and 8), but primarily offers a wide range of historical and archaeological data on the functioning of particular installations, their purpose and time or origin. Examples include aqueducts, sewers, cisterns, dams, as well as the early days of Ancient Greek installations for hygiene (lavatories) during the Hellenistic period and earlier as a factor of economic prosperity and living standards. Covered also are techniques of re-using water in ancient times after domestic or communal use. Such diverse issues make this tome even more interesting; it also present difficulties in doing justice to in such a brief review.

For instance, note the impressive range of sources in diverse chapters. The degree of detail in presentation of the subject in hand is at times bewildering, as exemplified by Chapter 4, in which the author, Georgios P. Antoniou, provides a detailed analysis of buildings and water devices in Ancient Greece, with specifications of their dimensions down to the centimetre.

Personally, I consider Chapter 7 to be particularly interesting. It is devoted to the characteristics of water engineering across the former Roman Empire, in times of great prosperity when it covered the territory of modern-day Belgium, central and northern France and stretching south to Spain and North Africa. The author emphasises the role of Greece in science, but also points out the tremendous contribution of Rome to the development of engineering. Not only does this chapter present the construction of devices such as fountains, baths, cisterns and advanced aqueduct systems, but also highlights the material from which they were built. For a layperson, such antique engineering constructions are particularly associated with stone (e.g., Pont du Gard in France, the aqueduct

of Segovia in Spain, or Aqua Alexandrina in Italy). However, during Roman times it was also common to use wooden, terracotta and lead pipes, depending on the particular part of the structure. The author stresses the remarkable precision with which Roman aqueducts were constructed. Roman constructions were an extraordinary technical achievement, as the author (pp. 118–119) illustrates, “(...) One very interesting example (...) is the aqueduct of Nemausus (built around 20 B.C.) conveyed water approximately 50 km (...). The elevation difference over the length of the aqueduct was only 17 m, with an average slope of 0.0008.5 m/m and the smallest slope being 0.00007 m/m (...).” Considering these data, it is more than reasonable to observe that ancient civilisations reached a very high level of development, not only in Europe and the Near East.

In my opinion, the cross-sectional Chapter 9 is also amongst the most interesting parts of the present book in that it discusses different cultures in South and North America, ranging from the Anasazi culture in Utah and Arizona and their water capture system in a dry climate, to the Inca Empire in pre-Columbian times. Analyses of water technologies discussed, compared to those in Europe and the Near East, reveal similarities, but also numerous differences. This could be determined by a number of factors, including not only cultural shaping of the contemporary world, but also different environmental conditions of the region. These particularly include climate (from very dry to warm and humid) or the presence of natural water bodies, e.g., cenotes in Central America. This chapter also has a few minor drawbacks, as exemplified by Figure 9.2. Delineation of the area inhabited by the Anasazi culture, neighbouring on Hohokm and Mogollon, is quite imprecise, its extent having been larger (Morrow & Price, 1997; Clark, 2002).

Although the chapters concern water technologies, they in fact discuss very diverse issues and presents both archaeology-based and purely engineering knowledge. Therefore, in my view as a natural scientist, some chapters lack data on natural conditions in particular regions of the world that are discussed. However, such data are briefly, yet sufficiently, provided by Moradi-Jalal et al. in Chapter 5. Based on the example of the Iranian Plateau (a historically important transcontinental corridor) and the Persepolis Complex, the authors describe the natural environment as one of the most important components in ancient water technology. They discuss climatic conditions, geological background, natural water drainage in earlier eras and access to water in Ancient times. They even analyse, in general terms, precipitation, outflow and runoff,

and refer it to the study area as an important factor in the development of water technology.

Unfortunately, not all chapters have such a description of the issue. For instance, this concerns Chapter 8 (a typical case study), in which the evolution of the water system in the Syrian city of Apamea is described with the framework of political influences more than 2,000 years ago. However, it does not discuss natural conditions that directly determined the development of the area, in addition to human activity. In my view, a small subsection could have enriched this technical chapter in this way.

The tome could also have benefited from a separate chapter with a cross-sectional description of past climate changes in the regions studied, and their impact on the development of particular water technologies. This would also have been worthwhile considering contemporary water levels in any given area and problems of obtaining water and transport within the context of water engineering and climatic conditions. Of course, this is what a natural scientist would be interested in.

The present book discusses East Asia very briefly; the presentation of East Asian water technology in Chapter 11 appears too general. The discussion and presentation of the city of Angkor (or other cities in this region of Asia) is not very detailed in comparison to that on water technology in Egypt, the Roman Empire and Mesopotamia. In my opinion, water technology in the Khmer Civilisation or in China had deserved a more comprehensive discussion, maybe even a separate chapter, as in a monograph by Viollet (2007). It would have been a perfect supplement to this interesting tome.

Particular chapters reveal a lack of consistence in the presentation of maps obtained from different sources. Maps of very uneven quality or presentation of scales have no place in a good publication such as this book. For example, Figures 1.14 and 1.15, 4.2 and 4.3, 6.3 a and b, in which the original scale should have been made graphically uniform in all maps and sketches presented. Some figures even lack a scale.

In spite of such minor critical remarks, I can definitely recommend this book. Because of its cross-sectional approach to the subject, the reader learns about water technologies from almost all over the world. The large number of illustrations constitute is an excellent supplement of the text. Both archaeological and technical data illustrate the high technological level attained by ancient civilisations globally, all of them developing independently. It is a publication worth recommending not only to engineers who focus on water technology of for-

mer civilisations, but also to archaeologists or natural scientists who are interested in the human impact on natural environments, and the hydrosphere in particular.

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