

CHAPTER
2

Section 3

SCIENCE & TECHNOLOGY *Early Water Engineering*

In addition to developing water systems for plumbing, ancient peoples also designed ways to control water to improve agriculture. In the dry regions of the Middle East, effective irrigation techniques for farming were a crucial element in the survival and growth of cities.

Around 6000 B.C., people settling in Mesopotamia initially attempted to bring water to farmland by digging small ditches leading away from springs. However, the Sumerians were the first civilization to conduct large-scale irrigation in an organized fashion. About 3000 B.C., water from both the Tigris and Euphrates rivers was delivered by a systematically developed network of dams, reservoirs, and canals.

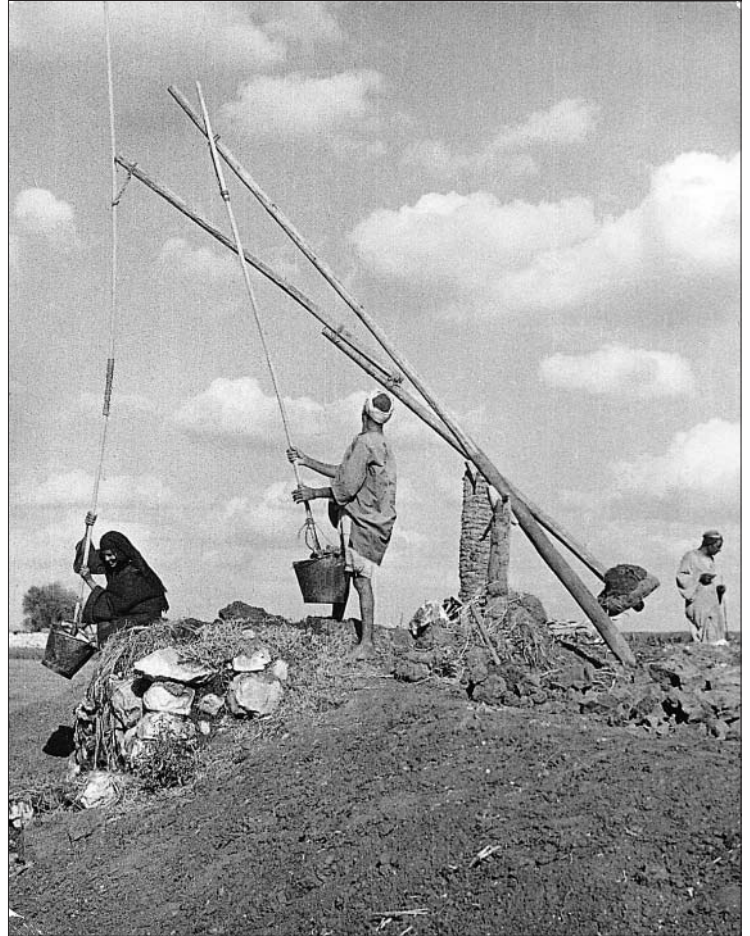
Early Sumerian irrigation consisted of farmers simply carrying water from a river to their plots. As farmers increased the size and number of their fields, they cut narrow slots in the natural dams that had formed along the banks of these rivers. This allowed farmers to divert water to their tracts of land. Farmers also collected water in small reservoirs that they had built. They then lifted it from these pools into shallow irrigation ditches with the shaduf, a bailing bucket mounted on a long counter-weighted pole. The shaduf is still used today in many parts of the Middle East.

Increased watering allowed more land to be cultivated, and irrigation ditches soon covered the fields near the main rivers. Later, organized gangs of workers dug long canals to channel water to fields several miles from the rivers.

Soon, nearly every piece of farmland had a canal or waterway along one side of it.

Whole-field watering was accomplished by opening the wall of a canal and flooding the field. Irrigating in this manner was important for both growing food and enabling the Sumerian plowmen to work the soil. In addition to nourishing the crops, the water helped soften the ground that had been baked hard by the intense sun and heat in the region.

The first *Farmer's Almanac* was written in Sumer and gave farmers specific guidance as to the timing, size, and number of crop waterings throughout the year. This advanced system of crop



J. Allan Cash Ltd.

The person on the far left fills the bucket on the shaduf with water. That person then swings the weighted pole around to fill the irrigation ditches.

irrigation helped the Sumerians produce a significant surplus of food, which supported the growth of cities in Mesopotamia.

Questions

Recognizing Facts and Details

1. What were the various methods that Sumerian farmers used to water their fields?
2. What is a shaduf?
3. **Drawing Conclusions** Why was it important to always have a canal or waterway next to a field?