2.1. The Ancient Orient

Note. This section of notes is a paraphrasing of Eves' Section 2.1. Early math was developed, unsurprisingly, as a practical necessity. This need developed with the appearance of the first cities and trade. These new forms of society developed along the great rivers Africa and Asia: the Nile in Africa, the Tigris and Euphrates in the fertile crescent of modern-day Iraq, the Indus and Ganges in India, and the Yellow and Yangtze in China.

From Center for Educational Technologies map of Middle East Rivers(left) and Stanford Program on International and Cross-Cultural Education map of Rivers of Asia (right).

The rivers offered a means of transportation, irrigation, and the possibility to convert land to agricultural use. Such projects required engineering, payment, and administration, leading to the need for technical knowledge and the associated mathematics. There was a need for a calendar, a system of weights and measures, surveying methods, and the development of a technique for collecting taxes to pay for the engineering projects.

Note. Once the applications of math were introduced for their applications, "…tendencies toward abstraction were bound to develop, and to some extent, the science was then studied for its own sake. It was in this way that algebra ultimately evolved from arithmetic and the beginnings of theoretical geometry grew out of mensuration [measurement]." These abstractions and theory did not lead to the idea of "proof" until the time of the Greeks (Thales of Miletus [circa 624 BCE– circa 547 BCE] is credited with the first geometric proof; this is discussed in more detail in Section 3.1. Birth of Demonstrative Mathematics). Instead, "recipes" were given to solve particular problems and there was no attempt at generalization. To teach a technique (Eves mentions solving quadratics; page 39), repeated specific examples were given with the intention of the general process becoming clear.

Note. From the perspective of learning the history of math from the time frame of this chapter (roughly 2000 BCE to 500 BCE), a difficulty is presented by the preservation of mathematical works. The Babylonians used baked clay tablets that

have survived in great number. The Egyptians used stone engravings and papyrus scrolls. The stone engravings and hieroglyphics are well-known. Some of the fragile papyrus scrolls survive due to the dry climate of Egypt. As a result, we are reasonably knowledgeable of the mathematics of ancient Babylon and Egypt. In China and India, perishable media like bark and bamboo were used as a writing surface and little is known about their mathematics. This chapter, therefore, focuses on the mathematics of the time in Babylon and Egypt. We will consider Chinese and Indian mathematics in Chapter 7, "Chinese, Hindu, and Arabian Mathematics," and the time frame there will be roughly 500 CE to 1300 CE.

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