



**FIGURE 1.1** Sumerian clay tablet from the third millennium BC on which are believed to be the world's oldest written prescriptions. Among them are a preparation of the seed of carpenter plant, gum resin of markhazi, and thyme, all pulverized and dissolved in beer, and a combination of powdered roots of "Moon plant" and white pear tree, also dissolved in beer. (Courtesy of the University Museum, University of Pennsylvania.)

apparent references to such minerals as iron oxide, sodium carbonate, sodium chloride, and sulfur. Animal excrements were also used in drug therapy.

The vehicles of the day were beer, wine, milk, and honey. Many of the pharmaceutical formulas employed two dozen or more medicinal agents, a type of preparation later called polypharmacy. The Egyptians commonly used mortars and pestles, hand mills, sieves, and balances in their compounding of suppositories, gargles, pills, inhalations, troches, lotions, ointments, plasters, and enemas.

## Introduction of the Scientific Viewpoint

Throughout history, many individuals have contributed to the advancement of the health sciences. Notable among those whose genius and creativeness had a revolutionary influence on the development of pharmacy and medicine were Hippocrates (ca. 460–377 BC), Dioscorides (first century AD), Galen (ca. 130–200 AD), and Paracelsus (1493–1541 AD).

Hippocrates, a Greek physician, is credited with the introduction of scientific pharmacy and medicine. He rationalized medicine, systematized medical knowledge, and put the practice of medicine on a high ethical plane. His thinking on the ethics and science of medicine dominated the medical writings of his and successive generations, and his concepts and precepts are embodied in the renowned Hippocratic oath of ethical behavior for the healing professions. His works included the descriptions of hundreds of drugs, and it was during this period that the term *pharmakon* came to mean a purifying remedy for good only, transcending the previous connotation of a charm or drug for good or for evil purposes. Because of his pioneering work in medical science and his inspirational teachings and advanced philosophies that have become a part of modern medicine, Hippocrates is honored by being called the Father of Medicine.

Dioscorides, a Greek physician and botanist, was the first to deal with botany as an applied science of pharmacy. His work, *De Materia Medica*, is considered a milestone in the development of pharmaceutical botany and in the study of naturally occurring medicinal materials. This area of study is today known as natural products chemistry and/or pharmacognosy, a term formed from two Greek words, *pharmakon*, drug, and *gnosis*, knowledge. Some of the drugs Dioscorides described, including opium, ergot, and hyoscyamus, continue to have use in medicine. His descriptions of the art of identifying and collecting natural drug products, the methods of their proper storage, and the means of detecting adulterants or contaminants were the standards of the period, established the