FIGURE 1.9 F. W. Sertürner isolated morphine from opium poppy (*Papaver somniferum*) in 1805, ushering in a new era of the development of medicines whereby an isolated constituent, rather than the entire plant, was considered the "active" ingredient. (From *Great Moments in Pharmacy*. 1966. Illustration by Robert Thom. Printed with permission of American Pharmacists Association Foundation. Copyright 2010, APhA Foundation.)

Flückiger perhaps best summarized this broader scope of pharmacognosy in the first edition of his *Lehrbuch der Pharmakognosie des Pflanzenreiches* (1867), describing the field as "the simultaneous application of various scientific disciplines with the object of acquiring a knowledge of drugs from every point of view." Still, in its formative years, the descriptive aspects of pharmacognosy dominated, with botanical microscopy central to the identification of plants; however, growing emphasis was placed on chemistry as the field of organic chemistry and the development of medicines made from purified compounds evolved (Table 1.2).

In Search of the "Magic Bullet"

In 1805, Friedrich Wilhelm Adam Sertürner, an apprenticed apothecary's assistant in Hannover, Germany, who had little formal training in pharmacy, succeeded in isolating the first pure, presumably "active" compound of a plant—the alkaloid morphine from the opium poppy (*Papaver somniferum*)—from plant material (Figures 1.9 and 1.10). In the years following the isolation of morphine, numerous other alkaloidal compounds were isolated, including strychnine, caffeine, and quinine (Kapoor 1997). This represented a dramatic departure: from the development of whole plants as drugs to chemical analogues of drugs originally derived from plants. The search for "active constituents" had begun.

This change is illustrated in the evolution of the *United States Pharmacopeia* (USP). In the first edition (1820), approximately 150 herbal drugs were listed. By 1950, this number had been reduced to approximately 50. Between 1870 and 1970, the total number of botanical drugs in the USP fell from 636 to 68 (Boyle 1991), while increasing to hundreds of relatively pure compounds.

During a similar period in the United States (1831–1950), the professions of medicine and pharmacy were also evolving. In the earliest times, the herbalists and "rhizomatists" were primarily involved in the collection, distribution, and quality assessment of medicinal plants. As societies became less agrarian and more industrialized, the field of medicine also evolved and commerce in drugs shifted from individual collectors and practitioners to brokers and distributors long disconnected from the source of the plant. This societal change similarly caused a shift away from the herbalists and local "healers" to the emerging academically trained medical profession.

The physician's training in materia medica began to deemphasize the physical assessment and commercial sourcing aspects of botanical procurement evident in early materia medica and gave greater focus to medicinal activity. Similarly, the focus of the pharmacist became the compounding and dispensing of medicines. Thus, the techniques of pharmacognosy, which had been previously considered a division of botany by some and a distinct science by others, and had been dominated by physicians, became an integral but specialized part of pharmacy and the training of pharmacists—pharmacognosy.