

participated regularly ever since. By 1870, the USP was so nearly in the hands of pharmacists that vigorous efforts were required to revive interest in it among physicians. The present constitution and bylaws of the United States Pharmacopeial Convention provide for accredited delegates representing educational institutions, professional and scientific organizations, divisions of governmental bodies, non-United States international organizations and pharmacopeial bodies, persons who possess special scientific competence or knowledge of emerging technologies, and public members (2). Of the eight elected members of the board of trustees, at least two must be representatives of the medical sciences, two others must be representatives of the pharmaceutical sciences, one must be a public member, and three shall serve without restriction concerning their affiliation.

After the appearance of the first USP, the art and science of both pharmacy and medicine changed remarkably. Before 1820, drugs to treat disease had been the same for centuries. The USP of 1820 reflected the fact that the apothecary of that day was competent at collecting and identifying botanical drugs and preparing from them the mixtures and preparations required by the physician. The individual pharmacist seemed fulfilled as he applied his total art to the creation of elegant pharmaceutical preparations from crude botanical materials. It was a time that would never be seen again because of the impending upsurge in technologic capabilities and the steady development of the basic sciences, particularly synthetic organic chemistry.

The second half of the 19th century brought great and far-reaching changes. The industrial revolution was in full swing in the United States. The steam engine, which used water power to turn mills that powdered crude botanical drugs, was replaced by the gas, diesel, or electric motor. New machinery was substituted for the old whenever possible, and often machinery from other industries was adapted to the special needs of pharmaceutical manufacturing. Mixers from the baking industry, centrifugal machines from the laundry industry, and sugarcoat-ing pans from the candy industry were a

few examples of improvisations. Production increased rapidly, but the new industry had to wait for the scientific revolution before it could claim newer and better drugs for mankind. A symbiosis between science and the advancing technology was needed.

By 1880, the industrial manufacture of chemicals and pharmaceutical products had become well established in this country, and the pharmacist was relying heavily on commercial sources for drug supply. Synthetic organic chemistry began to have its influence on drug therapy. The isolation of some active constituents of plant drugs led to the knowledge of their chemical structure. From this arose methods of synthetically duplicating the same structures, as well as manipulating molecular structure to produce organic chemicals yet undiscovered in nature. In 1872, the synthesis of salicylic acid from phenol inaugurated the synthesis of a group of analgesic compounds including acetylsalicylic acid (aspirin), which was introduced into medicine in 1899. Among other chemicals synthesized for the first time were sleep-producing derivatives of barbituric acid called barbiturates. This new source of drugs—synthetic organic chemistry—welcomed the turn into the 20th century.

Until this time, drugs created through the genius of the synthetic organic chemist relieved a host of maladies, but none had been found to be curative—none, that is, until 1910, when arsphenamine, a specific agent against syphilis, was introduced to medical science. This was the start of an era of chemotherapy, an era in which the diseases of humans became curable through the use of specific chemical agents. The concepts, discoveries, and inspirational work that led mankind to this glorious period are credited to Paul Ehrlich, the German bacteriologist who together with a Japanese colleague, Sahachiro Hata, discovered arsphenamine. Today many of our drugs originate in the flask of the synthetic organic chemist.

The advancement of science, both basic and applied, led to drugs of a more complex nature and to more of them. The standards advanced by the USP were more than ever needed to protect the public by ensuring the purity and uniformity of drugs.