

## Chapter 2 Early History of Pharmacy

In primitive times people learned to control many facets of their life but there were many things that they could not control: disease, weather, availability of food, accidents, etc. They attributed these uncontrolled events to outside forces or spirits. Within their society they designated people to assist them in dealing with the supernatural world. These people performed the functions we now designate as priest, medical practitioner and pharmacist. The three roles were combined until society evolved to a more sophisticated level. Even now there are some intermingling elements.

Use of herbal mixtures, minerals and animal (and insect) parts began early in human history. Primitive societies were regularly faced with food shortages and it is conceivable that during these times they experimented with various plants. This learning process introduced them to alternate food supplies and to some plants that had pharmacological effects, usually vomiting and diarrhea. Perhaps some were used topically for their soothing effects. It is also possible that innate human curiosity led to the use of some plants. In any case a variety of substances became their medication and they turned to them when they were ill or injured. It is likely that many plants had properties attributed to them that were incorrect but the power of the placebo and the ability of Mother Nature to heal produced positive results often enough that they continued to be used. Some such as opium were found to be consistently and dramatically effective and became widely used.

There are a surprising number of products that have been used for thousands of years. A large number of the drugs used throughout history have been laxatives, perhaps because so many plants have laxative properties, and this historical connection survives with many current products.

### Historical Landmarks

Pharmaceutical prescriptions have been dated back to 3700 BC ancient Egypt. Jars dating to 3150 BC were found in Egypt with plant derived ingredients and wine residue. This would indicate that wine and alcohol were part of medicine in addition to being used as a beverage. Professor McGovern of the University of Pennsylvania who conducted the research has also found evidence of alcoholic beverages in China dating back to 7000 BC. A recipe book called the Ebers Papyrus was discovered in Egypt by a German archeologist and is dated back to 1552 BC. It contains invocations for driving away disease as well as recipes that contain over 700 ingredients some of which are well known to us; vinegar, turpentine, figs, castor oil, mastic, wormwood, aloes, opium, peppermint, cassia, caraway, coriander, anise, fennel, saffron, linseed, henbane, poppy, gentian, colchicum, squill, grapes, onions, etc. These plus other substances were in use for thousands of years as we can see from pharmacopeias of the sixteenth and seventeenth centuries.

Other ancient societies such as China, Sumeria, India, aboriginals in the Americas and

Africa also had their own systems. Some of these have been documented and there is a literature on them, for others we can only assume that they existed. All societies have searched for remedies to help them deal with illness. The most success appears to be in the area of laxatives and purgatives.

Much of the terminology in pharmacy comes from the Greeks, beginning with the term pharmacy is derived from the term Pharmakon which had the meaning of "to mix". Greek contributions to the sciences are substantial and formed the basis for study during the succeeding centuries in European universities. There exists an enormous literature for those who are interested. The life of Hippocrates is of particular interest as he was a dominant force in ancient science and in the pharmacy field developed fomentations (warm lotions applied topically often with medication), gargles, poultices (topical semisolid medication applied locally in a fabric container), lozenges (a hard compressed dosage form that releases medication slowly in the mouth, it is to be sucked rather than swallowed), suppositories (an anal dosage form that releases medication), pills (a round solid dosage form that contains medication) ointments, cerates (a wax for topical use), collyria (solution for the eye) and inhalations of vaporized liquids.

In Greek mythology Hygeia, goddess of health, was the daughter of Asklepios, the god of healing. The other daughter was Panacea, goddess of medicine. She is often depicted with a serpent of miraculous powers on her arm and a bowl. The serpent is thought to represent Asklepios as at the time harmless snakes were found inside the temples. These serpents were dormant and appeared to be dead. When picked up and dropped, however, they slithered away. The ancient Greeks thought the snakes were brought back to life by the healing powers of Asklepios. The staff (caduceus) and serpent are now the symbol of medicine while the bowl is the symbol of pharmacy, often with a serpent on it. This symbol is on many pharmacy signs and is recognized internationally as the symbol of Pharmacy. You will see it associated with organizations such as the International Federation of Pharmacy (FIP).

Galen taught Pharmacy and Medicine in Rome about the time of Caesar. He was a physician to gladiators and Roman emperors. His research on plants was the basis for teaching for the next 1500 years. He wrote extensively and his intelligently formulated products were in widespread use. Although known for his role in Medicine, he also made a major contribution to Pharmacy in his study and use of medicinal plants. In Pharmacy, medications obtained from plants are known as "galenicals". The study and use of plants as medicine is a field of pharmaceutical study called Pharmacognosy. The identification and characteristics of medicinal plants in past pharmacy programs was often referred to by students as "weeds and seeds".

In the third century A.D., the twin brothers Damian and Cosmos practiced medicine in Asia Minor. They were Christian, living in the Roman world. Their high level of practice and

reports of miraculous cures brought patients from the whole empire. They are the patron saints of Pharmacy and throughout Christian history there are references to sanctuaries in their name and many historical paintings.

During the Dark Ages in Europe the art and science of science, including pharmacy, was kept alive in the Arabian world. The cosmopolitan cities of Cordoba, Baghdad, and Damascus had huge libraries and schools that collected and studied the writings of Greek, Indian, Persian and Roman scholars. This learning was returned to Europe following the Crusades. The names of Maimonides (Code of Ethics), Avicenna and Avenzoar are linked to this period. In Europe during the eighth to tenth centuries the monasteries were an important in the preservation and translation of historical knowledge. The monks translated Greek and Arabic books into Latin and preserved them. They also cultivated and named herbs. For example rosemary is derived from Rose of St. Mary. In the same period the word "drug", meaning "dry herb" was derived from Teutonic language. It was almost five hundred years later in the sixteenth century that the term druggist as a seller of drugs came into use. The monasteries provided care to the sick based on good food, rest, and decoctions of simple medications from their gardens. The few hospitals in the cities that existed at the time were places one went to die rather than treatment centres.

The Oath of Maimonides (Moses Maimonides 1135-1204)

May the love for my art actuate me at all times: may neither avarice nor miserliness, nor thirst for glory, or for a great reputation engage my mind: for the enemies of truth and philanthropy could easily deceive me and make me forgetful of my lofty aim of doing good to our children. May I never see in the patient anything but a fellow creature in pain. May I have the strength, time and opportunity always to correct what I have acquired, always to extend its domain: for knowledge is immense and the spirit of humanity can extend infinitely to enrich itself daily with new requirements.

Here am I ready for my vocation, and now I turn unto my calling.

During the succeeding centuries there was a complex, active quasi-scientific movement that spread across various disciplines which mixed science, religion, alchemy, ancient historical tracts, charlatanism and politics. This gave rise to a flood of ideas which could now be widely circulated due to the invention of the printing press. Many of the old apothecary shops in Europe date from this time and are interesting places to visit. It was in this period that the practice of limiting the number of pharmacies in an area was developed and continued to this day. In England and much of the English speaking world this practice was not adopted.

An important date in Pharmacy history is 1240 when Emperor Frederick of the Holy Roman Empire enacted 5 Articles that separated Medicine and Pharmacy as professions.

This is a key date that pharmacists all over the world recognize and refer to in their history. One reason for its importance is that there has been a continual attempt by Medicine to control Pharmacy. This was because the apprentice physicians usually spent time as a compounder as part of their training. Much of Canada's legislation in Pharmacy came about due to the threat of Medical legislation that sought to control Pharmacy.

The fifteen and sixteenth century were characterized by the development of complex compounding procedures for the growing array of herbs, spices, minerals, chemicals and many other, sometimes bizarre, substances finding their way into practice. These formulae were printed in books called formularies. The first pharmacopeia was printed (a new invention) in Florence in 1498, in Italian rather than Latin, by physicians at the request of the apothecary guild. Florence was a major trading site with connections throughout the known world and various practices and medicines were used. The pharmacopeia was to simplify and standardize therapy. A number of pharmacopeia, formularies and dispensatoria were developed in Europe over the next two centuries. There was also a complementary growth in regulation and standards throughout Europe. One practice that continued until recently was the law regulating poisons. In 1557 in England the "Grocers and Apothecaries Act" came into force which required the apothecary to determine the honesty of the purchaser of a poison and to inquire of its purpose as well as recording the name and time of purchase. Poisoning was a serious offence in England and a person convicted of poisoning someone suffered the punishment of being boiled in oil. In other countries at a later date poisoning became a common practice. Nicotine, the alkaloid found in tobacco, was listed as a poison for many years following its identification and extraction. The alkaloid nicotine received its name in 1559 from Jean Nicot, the French ambassador to Portugal, who introduced tobacco growing to Europe as a plant with many virtues.

Paracelsus in the early 1500's played a major role in disturbing the system of healing and prescribing in Europe. He was frustrated by the formal, complex system of healing and travelled widely to study various ways of healing. This led him to use simple, effective methods and drugs but this alienated him from the established practitioners. At that time the works of Galen and others were memorized by students and accepted uncritically even when it was clear that they were in conflict with what was observed. Perhaps this uncritical acceptance of knowledge was influenced by the system of teaching in the church. Paracelsus' negative attitude toward physicians and apothecaries constantly landed him in trouble and required that he move frequently. For example, in Basle, he denounced the apothecaries and their drugs, "The apothecaries are my enemies because I will not empty their boxes. My recipes are simple and do not call for forty or fifty ingredients". During his travels he wrote many books and explained the use of chemicals for internal use. Because of the large number of drugs that he used and the influence of his writing, his name is often seen in historical tracts.

In the sixteenth century in England the Faculty of Medicine gave members the right to

practice medicine, pharmacy and surgery. The assistants and apprentices of these medical men were called apothecaries and performed minor medical and surgical duties as well as compounding of prescriptions. As these assistants became more skilled they broke away and formed their own organization in 1606 jointly with the Grocers Guild. They formed an independent guild in 1617. King James I is quoted as stating, "Grocers are but merchants; the business of the apothecary is a mystery; wherefore I think it fitting that they should be a corporation of themselves". This was done in 1624. The term mystery in this context refers to a profession as the knowledge base was not known to the public. This was an important beginning to the concept of the "art and profession of pharmacy".

The Apothecary Guild prepared the London Pharmacopeia in 1618 listing the traditional medicinal products some of which went back to Greek and Roman origin. This project was supported by the physicians. It was written in Latin and this made it useful in several countries. Several editions were published at intervals of 20-30 years. Over the next century or two many new substances were introduced as being wonderful remedies and were listed. Cinchona for the treatment of malaria was introduced from South America. Tea, coffee and chocolate were incorporated into the listing as they became known and used. Even tobacco had a place. Various techniques for extracting medication from botanical sources were used. Roots, bark and woody stems were broken up and ground to a fine powder in a mortar. Hard inorganic substances were placed in a metal contusion mortar and pounded down to small bits by the apprentice. Extraction of active ingredients using infusion, the same infusion process used to make tea, and percolation in which hot water or other liquid was poured over herbs in a funnel shaped cone and the liquid percolated through, the same process as we now use for making coffee. When we make tea and coffee we are making a palatable extract of caffeine, a drug. The differential solubility of aromatic oils, caffeine and tannins results in the aroma being released first, then the caffeine and after a longer period the tannins are extracted making the beverage more bitter and astringent.

In the discovery process some products were found to be highly toxic and found use as poisons. This in turn led to France establishing a poison register in which certain substances could only be sold to known individuals who then had to sign for them and indicate the purpose for which they were used. This procedure was adopted in Britain and its colonies and continued for a long period. In Canada poisons were used to obtain furs from wolves and other carnivores and later to kill pests that destroyed crops or farm animals. Only a few decades ago the use of a poison register in each pharmacy was discontinued.

During the period of 1600-1800 there were many inventions. Pharmacists had an interest in chemistry and alchemy which resulted in them discovering elements, chemicals, and also coining words such as gas and electron that are still in use. In this era science was surrounded by myth, religion and superstition. The advances in science were often easier to achieve than overcoming the erroneous beliefs that were firmly held. It was in 1673 that the

first patent medicine was introduced and protected by letters patent which protected them from competition. Later the term was applied to any product promoted to the public without disclosure of the ingredients. In Canada we had a Proprietary or Patent Medicines Act from 1908 until 1964.

Because Canada was a British colony it followed British legislation and culture. To all intents the people living in a colony considered themselves to be living in the home country, but just a little further away. The people higher on the social ladder move easily from one country to another and looked to the colonies as a place to make their fortune, either through obtaining land or trade grants from the Crown or through serving in a senior capacity and using their position to collect a substantial salary. In the case of health care the legislation for licensing health professionals and in selling goods was British and it was only after Canada became a self governing Dominion did this slowly change.