Chapter 5, Canada and Pharmacy 1815 to 1840.

In Europe the period following the Napoleonic wars was one of deceptive calm. Liberty, democracy, and equality were concepts that were actively discussed in the West European countries and events that were taking place around the world were closely followed. In most countries agitation and social unrest gathered momentum. There were a number of insurrections and the secure place of royalty in countries was no longer accepted. It was also the time when diseases from the Far East (India) arrived in Europe along with the increased trade and travel. Local and international epidemics of cholera occurred between 1826 and 1837. In Europe over 900 000 died in 1831 alone.

The arrival of steam powered ships early in the century increased the flow of goods and people and drastically reduced the cost of travel. This was a major force in making immigration attractive and as a political option during the clearance of the Scottish highlands and later the potato famine of Ireland. In terms of trade the increased shipping allowed more British exports generated by the Industrial Revolution and the greater colonial empire provided both a market for goods and a source of raw materials.

The Parliamentary Reform Act of Britain in 1832 led to the abolition of slavery, free trade, and less autocratic government of the colonies. Britain was the dominant economic power and had outlawed the transportation of slaves in 1807. The Royal Navy enforced the law which led over time to other countries outlawing slavery as well.

This was the age of the Industrial Revolution and in Europe, but especially Britain, cities grew with kilns, mines, foundries and factories which polluted the atmosphere, land, and water. The homes of the worker were crowded slums between the industrial sites. Public health initiatives were begun with examination of the

health of the laboring class and the incidence of disease and death. It was noted that lifespan was short and that most workers were not in good health. The average age of death for the working class was under 20 with most deaths before one year of age. Skilled workers and gentry had significantly higher average age for deaths but they were usually under 45 years. Infectious disease was prevalent and exacerbated by the crowded living conditions the main diseases were consumption (tuberculosis), typhus, smallpox, and cholera epidemics.

This was also the beginning of a massive wave of immigration from Britain to the rest of the world but mainly North America. Over the next century 4.2 million people moved to Canada and 13.7 million to the United States. In comparison only 2.4 million went to Australia and 760,000 to South Africa. This was the largest sustained flow of people in world history.

The population of British North America in 1812 was only 500,000 and mainly French and aboriginal. In 1815 the British West Indies had a population of 64,000 whites, 750,000 slaves and 70,000 coloured (mixed blood and East Indian).

Canadian Development

This period was one of exploration and growth. The combined exploration of the West Coast from the sea and from inland by the explorers of the Hudson Bay Company provided a fairly accurate map of the topography and the landmass for the first time. There was also a recognition that the United States was racing westward to claim the land bordering the Pacific Ocean. Some Americans were also pushing south resulting in the Battle of the Alamo in 1836 where they were defeated but this was the forerunner to the war with Mexico and the seizure of the Southwest in 1846-47.

The War of 1812-14 had just ended and the British maintained

troops in Canada and built a number of forts to protect the boundaries. Some of the forts, such as Fort York, had been burned to the ground during an American invasion. Many of the forts and tourist sites in Canada date from this period. It was the cost of maintaining troops and building forts in Canada that led to Britain giving greater thought to making the colonies self-governing and self-financing. This approach applied a few years earlier would likely have prevented the American Revolution. More reliance was placed on the militia which numbered 30 regiments and about 14 000 officers and men at the end of the war. Over the next decade the numbers increased to 54 regiments and twice as many personnel. This force was available at the time of the Revolt in 1937. The main difficulty in achieving self-government and self-financing was the sparse population in Canada. The larger centres in the United States and the more active economic climate were powerful magnets that attracted many of the British immigrants that had come to Canada.

The Indians who had been of vital importance to Canada during the War of 1812-14 were given little credit for their contribution. Tecumseh was recognized by the people of the region but not the government and Britain. His death on the battlefield when abandoned by the British Regulars on the field was not publicized. The Royal Proclamation of 1763 had given rights to the Indians which included the right to vote.

In Canada the colonies were increasingly self-governing and were largely dependent on British funding that came to Canada to pay for troops and their accommodation, food, and travel. British regiments had been sent to Canada as the United States was sympathetic to France then now at war with Britain and there was concern that the US might attack Britain through Canada. Each colony had a Governor appointed by Britain and most of them insisted on their prerogatives to govern as they saw fit with a small executive committee to assist them (referred to as the Family

Compact). It was acceptable in that era that senior administrators would have several appointments and earn a handsome salary. Over time this system in which the public had little voice in taxation and government expenditure became increasingly unacceptable to people in Upper Canada (Ontario) and Lower Canada (Quebec). The 1837 Revolt (McKenzie and Papineau) in these two colonies grew from demonstrations to violence resulting in the government mobilizing troops and paramilitary patriot militia. In Upper Canada there were few deaths and the revolt was quickly quenched with McKenzie King fleeing to the United States. It was much more serious in Lower Canada. The fights and skirmishes left 300 dead. More than 1300 were imprisoned, twelve were hanged, 8 exiled to Bermuda, and 58 deported to the penal colony in New South Wales in Australia. A further 500 escaped to the United States. In traditional form the army exacted reprisals against the communities that had risen up in revolt by looting, burning homes and forcing families to provide accommodation for troops. The constitution was suspended for 3 years during which time the population had no rights and people stayed in prison for several years. The fight was mainly between those loyal to the colonial system (and Britain) and those who wanted more local input into government with equal rights for all citizens (women who were land owners had the right to vote in the 1820s and 1830s) but religious and racial barriers remained.

The Constitutional rights that were given to English in Britain were not equally applied to the people in Canada who were predominantly Scottish, Irish, US, German, black, francophones, or aboriginal.

There was an egalitarian society in North America that found the elitist British system incompatible with their views. The American Revolution and influx of Americans to Canada furthered this trend. William-Lyon McKenzie came from Scotland and established a drug and book store in Dundas (Ontario). He became so involved

in fighting the Family Compact that he left his store and became a full time journalist. After the revolt he fled Canada to the United States. Two of those who took part in the revolution were hanged and 93 sent as convicts to Tasmania the cruelest prison in Australia. Lower Canada was still a threat as many injustices still remained. Compensation to people who suffered losses during the Revolts were compensated in Upper Canada (mainly loyalists) while no compensation was paid in Lower Canada (francophones). The social unrest resulted in an investigation by Lord Durham, the Governor General, to determine the future of the country. These events led to responsible government and a democratic system in Canada with the leaders of Upper and Lower Canada uniting to achieve this goal and creating the context for uniting Upper and Lower Canada into a combined Canada in 1841. This development of responsible government in Canada and Nova Scotia was ahead of the other British colonies. The democratic movement was based on no group having a higher level than the masses.

His report is known as the Durham Report (1839) and is a key document in the history of Canada. It was in this context that the union of Upper and Lower Canada in 1841 as one colony began. This was the first step in Confederation. The two former colonies united to demand responsible government and both the English speaking and French speaking people were united in wanting good government. Durham’s proposal that Quebec become anglicized did not occur. Government at the time, in terms of staff and programs, was minimal as there was little revenue flowing to the government. Customs duties on imports were the major source of income and this accounts for the many pieces of legislation at the time dealing with trade. In the 1830's duties on alcohol legally imported from Britain and the Caribbean accounted for up to half the government revenue in the Atlantic Provinces. As the duty on alcohol was quite high much more alcohol was imported illegally by rum runners.

In the West, the large settlements in the United States' mid-west, such as Minnesota, created a focus for economic activity with a strong impact on commerce and culture. There were many more cities in the United States (the only city in Canada was Montreal) and a higher population density with more industrial development. Canada was much more rural in the East and virtually empty in the West. The nature of the Hudson's Bay Company and the fur trade did not depend on a large population and the company actively discouraged people from coming into the area. American traders who entered the area were met with intense price competition to drive them out. The native and Métis people who had dominated the north west were reduced to a condition of social and economic marginality despite their improved economic status and unique culture. As the expansion and development of the Hudson's Bay Company ended there was more stability with a network of trading posts linked by trails and river transportation. Indians, Métis and some traders established an industry in supplying provisions to the trading posts and transporting goods. In addition some agriculture was initiated for personal and local consumption.

The creation of the Red River settlement was initiated to stream the dispossessed Scots and Irish to British North America rather than to the US. It also had the purpose of occupying land at the forks of the Red and Assiniboine rivers to confirm the rights of the Hudson's Bay Company and to block the Northwest Company from obtaining food and supplies from the area. This led to conflict with the Northwest Company in the short run but in the longer run it forced the amalgamation of the two firms. It also prevented the United States from expanding into this area from the more developed areas to the south.

Technology made great strides during the early 1800's. Of particular importance to North America was the development of steamships. The first steamship crossed the Atlantic in 1819. Up to this point navigation on rivers and lakes depended on oars, sails

and the current in the river. Strong river currents on major rivers made transportation slow and unreliable going upstream. Steamships enabled large quantities of supplies and large numbers of people to travel along the rivers changing the early transportation system of canoes and small sailing ships to a relatively high speed, efficient system. This was particularly true for the Great Lakes and major rivers which were the backbone of transportation in Canada. Settlers to the Canadian West were forced to use steamships to Duluth on Lake Superior then travel overland through boggy forests with minimal goods or to take US trains to Minneapolis and on to Winnipeg - a long and expensive trip.

The use of candles and fireplaces in wooden buildings resulted in numerous fires. As the towns grew the potential for major disasters increased. In New Brunswick a disastrous fire during a drought occurred in 1825 that leveled Fredericton killing 160 people and destroying over 4 million acres of forest.

Chemistry and Medical Advances

Although chemistry had begun two hundred years earlier in Europe, advances in knowledge and processes cumulative with a geometric progression in ongoing research. There was a widespread interest in chemistry in producing new products and medicines with pharmacists establishing laboratories in their pharmacies.

In 1718 Guillaume Rouelle solved the problem of the nature of salts, a product of the union of an acid with a base. His student Lavoisier did further research on acids and bases and is credited with the discovery of oxygen. (The history of pharmacy book Kremers and Urdang's History of Pharmacy contains a substantive description of pharmacists involvement in chemistry, botany and physiological discoveries). Pharmacists discovered the halogens:

chlorine by Scheele (1774), iodine by Courois (1811), bromine by Balard (1826), and fluorine by Moissan (1886) which won him a Nobel prize. Many elements were discovered by pharmacists and they made a substantial contribution to the development of the periodic table.

Chloroform was first made by the German pharmacist Friedrich Moldenhauer in 1830. The correct chemical formula was assigned to it by the Swiss pharmacist J.B.A. Dumas who replaced the designation "formyl chloride" with "chloroform". During this period the most respected chemists were the German pharmacists Klaproth and Marggraf. In addition to their many discoveries that led to a number of chemical industries, they also set the standard for describing their experiments in detail so that others could duplicate their results. This policy eventually curtailed the publication of questionable research. Klaproth did all his research in his pharmacy while continuing as a pharmacy practitioner.

Marggraf introduced the use of the microscope into chemistry to examine various crystalline structures. Nicolas LeFebvre introduced the use of a thermometer and Antoine Baume introduced hydrometers (1768). Catalysis was discovered and utilized by Johann W. Dobereiner in 1816. This enabled the hydrogenation of fats to a desired consistency.

Friedrich Wilhelm Serturner, a German apothecary, is credited with the discovery of alkaloids, the first being morphine (1815). He named the substance morphine from Morpheus, the god of dreams who in mythology was the servant of Somnos, the god of sleep. Following this came quinine, strychnine, brucine (used until recently to denature rubbing alcohol), narceine, veratrine, atropine, nicotine, codeine, and picrotoxin, all discovered by pharmacists. Extensive research in plant chemistry by research groups in Europe

identified many substances including cocaine isolated from coca leaves (1855). Caffeine was isolated from the coffee bean by F.F. Runge in 1821. The separation and purification of these many compounds was a vital step in understanding the structure and properties of the compounds. Pharmacists made a major contribution to this area and that of analytical analysis.

Marggraf's discovery of sugar in beets was important. During the Napoleonic war Britain, who had a virtual monopoly on cane sugar, blocked the import of this and all other products from the areas under Napoleon. Sugar from beets became widespread in Europe, not only for the rich, but for all people and the monopoly of Britain was broken.

Health Care

These advances in chemistry had an impact on medical practice. The use of crude extracts began to be replaced by isolated active ingredients. This gave greater precision to dosage and more consistency to patient response. Up to this point the description of drugs was based on their physiological properties. Both opium and nightshade (atropine) were classed as sleep inducing narcotics. Willow bark (salicylic acid) was an astringent. Substances that caused vomiting were emetics. Sudorifics made people sweat. Stimulants woke them up. Digitalis was first described as a diuretic as in increased urine flow but we now know that the effect was on the heart not the kidney. Many of the drugs used into the 19th Century as medicines are now recognized as poisons. These drugs in large doses cause catharsis, vomiting, sleep, or stimulation and were used in conjunction with restrictive diets, potent enemas or clysters, bleeding, leeches, and cupping. These were known a heroic measures used when people were not responding to less dramatic therapy. Heroic not only because of the large doses but also because they were often combined with a patient placed in a hot room under blankets while being bled, given large doses of

laxatives and emetics for several days. With more knowledge about drugs and the introduction of surgery with anesthesia heroic therapy began to fade.

There was a growing acceptance of public health, initially focused on preventing epidemics. Water treatment became accepted in the cities and isolation of people with infections diseases increased. This was also the period of medical reform in Britain with more physicians being trained in universities. General Practitioners were able to use the initials LSA after their name (Licentiate of the Society of Apothecaries). The Royal College of Physicians and the Royal College of Surgeons initiated licensing examinations and setting levels of qualification. There remained a large number of different organizations providing medical graduates with varying levels of ability. Social recognition of the profession improved with the initiation of medical journals to help physicians stay abreast of health care changes.

This was the era of scientific and technological advances. A few years later we saw the introduction of anaesthesia and the identification of infectious disease transmission (Semmelweis) which made surgery and childbirth safer (discovery of bacteria and pasteurization were to soon follow).

In the case of Pharmacy, the apothecaries in Britain joined with the physicians to become general practitioners in 1815 (the building housing the British Medical Association is known as Apothecary Hall) and the chemists and druggists took over the role of dispensing medication to the public. In Canada the shift also occurred with pharmacists being formally known as chemists (until recently the provincial pharmacy legislation stated that pharmacists were licensed as Pharmaceutical Chemists and could use the initials Ph.C.), commonly as druggists and in Quebec as pharmacien, a term used in France. In French the term "drogue" refers to narcotics so the term druggist is not used. The United

States continued to use the term apothecary, in addition to the more commonly used terminology of druggist, as the changes in Britain occurred after they became independent.

Pharmacy practice in various countries began to assume distinctive forms with Germany establishing a limit on the number of pharmacies in an area. This continues to today. They also established a high level of professionalism and refused to sell patent medicines, did not sell drugs to the public without a prescription and would only dispensed medication for physicians who were listed as qualified practitioners. Nonprescription drugs were sold in other stores called drogerie. In Britain the system was much more open and there was widespread use of various medications, much of it being sold outside pharmacies. France was between these two systems.

The first Canadian legislation following the Conquest was the Medical Act in Quebec (1788) which set out requirements for the practice of medicine, surgery, pharmacy and for apothecaries. Each was a separate registration. This was followed by legislation after the creation of Upper Canada to regulate the practice of medicine and surgery in 1795. This act was repealed and new legislation appeared in 1815 but it did not mention drugs or vendors of drugs. The regulations were focused on having physicians obtain a good knowledge of drugs (materia medica) and compounding. In forming the medical school in Toronto during the 1820's and 1830's (the first secular university in Canada) there was a requirement that one of the six professors be in materia medica and pharmacy. This was the beginning of medical legislation that attempted to control pharmacy up to Confederation.

In Nova Scotia medication was provided by apothecary shops and some retail pharmacies operated by physicians. An apothecary shop in Halifax was opened by Dr. James Avery in 1824 and over time became the first wholesale firm in Nova Scotia, operating as

Avery, Brown and Company. Baird Company in New Brunswick established itself as the earliest recorded drug wholesale company.

The first pharmacist in Newfoundland was Thomas McMurdo, who arrived from Scotland to establish a pharmacy in 1823. He and his son in law John McNeil educated pharmacists in their pharmacy for several decades and their firm remained a major force in pharmacy for over a century.

Pharmacies were established early in Nova Scotia. In 1828 JDB Fraser advertised in the Pictou N.S. newspaper; drugs, medicines, patent medicines, perfumery, spices, dye stuffs, etc. There is a record of him ordering from Walker and McCrea, Saint John Merchants: turpentine, saltpetre, alum, linseed oil, lard, sugar, castor oil, snuff, berries, and four gallons of rum along with other sundry supplies. He was very successful and sold products to PEI and the northern area of NS.

In 1848 he was selling chloroform that he had made to physicians, a product that had only been used as an anaesthetic in Scotland in 1847. The first Canadian surgical operation with chloroform was the amputation of a thumb. This then led to more extensive use. Fraser used chloroform when his wife gave birth to their 7th child. Initially there was some religious opposition to the use of anaesthetics at childbirth and it did not become accepted until 1853 when used by Queen Victoria.

In addition to selling medication Fraser also sold surgical supplies such as abdominal supporters, lancets, male catheters, bladder and water pipes, and injection bags to the Board of Health. To support the pharmacy it was necessary to sell other products such as vegetable seeds, ketchup, minor hardware items, coffee, varnish, spices, candles, and gunpowder. As a side line he pulled teeth. The sparse population in the Canadian colonies required that pharmacists sell a wide array of products in order to exist and this

situation continued, especially in rural areas, until fairly recent times. This is in contrast to Europe where pharmacies were able to confine their scope to health products. In this case Fraser was an exception as a businessman, health professional, and community leader. He is still recognized as a leading citizen and pharmacist of Nova Scotia.

Colin Briggs, a professor of Pharmacy in Manitoba and his wife, Elizabeth Briggs, published *The York Factory Medical Journals 1846-1849* in which they discuss the health care of the Hudson Bay employees and others in the fur trade. This is based on the information recorded at the time and is a valuable insight into treatment concepts. One example from the many in the book is a case of a 21 year old voyageur who was treated for a sore knee that had bothered him for four days. The examination showed a swollen join with pitting, fever, and a full and hurried pulse. The treatment consisted of cupping in the region of the joint with a cupping glass. The medication ordered in the first prescription was powdered jalap, 13 grains, and potassium bitartrate, 1 drachm, which was to be mixed and taken immediately (a strong laxative). The other prescription was for antimony tartrate, 3 grains; magnesium sulphate, ½ ounce; and 6 ounces of water. One large spoonful was to be taken every hour (this would be about 12 doses). This was another laxative but also a diuretic to remove excessive fluid. It would appear that the physicians used what was available and attempted to gain an improvement in health. Since Mother Nature and the placebo effect were also assisting the physicians they were able to take credit for success in many cases.

References

Briggs, Colin and Elizabeth. *York Factory Medical Journals 1846-1849*. Winnipeg: Westgarth, 2000.

Duffin, Jaclyn. *History of Medicine*. Toronto: University of Toronto Press, 1999.

Dunlop, A.C. "Pharmacist and Entrepreneur – Pictou's J.D.B. Fraser [1807-69]" Nova Scotia Historical Quarterly 4.1 1974: 22.

Flexner, Doris, and Stuart B. Flexner. *The Pessimist's Guide to History*. New York: Harper Collins, 2008.

Francis, R.D., and D.B. Smith. *Readings in Canadian History, Pre-Confederation*. Toronto: Harcourt-Brace Canada, 1998.

Morrison, J.H., and J. Moreira, Eds. *Tempered by Rum: Rum in the History of the Maritime Provinces*. Porter's Lake, NS: Pottersfield Press, 1988.

Norrie, K., D. Owram, and J.C.H. Emery. *A History of the Canadian Economy*. 3rd ed. Toronto: Harcourt Brace, 2002.

Raison, A.V. *A Brief History of Pharmacy in Canada.* Toronto: Canadian Pharmaceutical Association, 1967.

Sonnedecker, G. *Kremers and Urdang's History of Pharmacy*. 3rd ed. Madison: Lippincott, 1963.