

A short history of soap

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Few items of commerce are more ubiquitous or in more frequent use than soap. Few proprietary products have been offered over a longer period to the public by pharmacists, and by chemists and druggists before them, than some long established brands of toilet soap. Soap is perhaps the first manufactured substance with which we come into contact in our lives and it remains a daily necessity thereafter. For how long has this inexpensive but essential product been such a feature of daily life and how did its adoption come about?

By John A. Hunt, PhD, FRPharmS

There is no clear evidence that the use of soap for personal hygiene pre-dates the Christian era. Two mentions appear in the Old Testament. “For though thou wash thee with nitre, and take thee much soap, yet thine iniquity is marked before me,” says the book of Jeremiah. A more modern translation reads: “Though you wash with soda and use soap lavishly... .”¹ There are doubts as to whether this is a reference to true soap. It has been suggested that possibly a lye, made by mixing alkaline plant ash with water, was referred to, or possibly some form of Fuller’s earth.² This view is perhaps supported by the second mention, on virtually the final page of the Old Testament, in the book of Malachi, in which both the authorised version of 1611 and the modern translation read virtually identically: “He is like a refiner’s fire, like a fuller’s soap.”³ It has been suggested that some form of soap, made by boiling fat with ashes, was being made in Babylon as early as 2800BC, but probably used only for washing garments. Pliny the Elder (7BC AD) mentions that soap was being produced from tallow and beech ashes by the Phoenicians in 600BC.⁴ This might have been used as a hair pomade rather than a washing soap.⁵

Bathing in classical times

In classical times, perfumed oils were in extensive use for bathing and were combined with the use of the strigil, a metal implement used to scrape the skin free of oil and dirt. It is claimed that, for washing themselves, the Romans used a type of clay found near Rome called “sapo” from which the word soap is derived.⁴ An alternative suggestion for the derivation of the name is that the Romans learned the art of soap-making, using animal fats and plant ashes, from the Celts, who called it “saipo”.⁶

The use of soap in personal hygiene does not appear to have been adopted until the second century when the physician Galen (1300 AD) mentions its use for washing the body. Another physician, Priscianus (circa 385AD), reported the use of soap as a shampoo and made the first mention of the trade of “saponarius”, or soap-boiler.⁶

While soap was in use during the Roman period its adoption may have been slow, despite the popularity of public and private baths throughout the empire. Possibly early soaps, made from animal fat and crude alkali, were not particularly attractive in appearance or smell, and were deemed more suitable for cleaning and laundering. The remains of what might have been a soap factory were discovered in Pompeii, which was overwhelmed by an eruption of Vesuvius in 79AD, but possibly this was a site for producing a type of Fuller’s earth for cleaning fabrics.

Early centres of soap making

Little is known of the use of soap in the Dark Ages which followed the fall of Rome. Personal hygiene was probably not a high priority in regions where life was precarious. Saponins are widely distributed in the plant kingdom and such plants as *Saponaria officinalis*, *Quillaia saponaria*, *Gypsophila* spp and *Sapindus* spp contain useful amounts which might be used for cleaning purposes.

The manufacture of soap in Europe and the Mediterranean region had re-emerged by the end of the first millennium. Early centres of production were Marseilles in France and Savona in Italy. It has been suggested that the French word *savon*, for soap, may have been derived from the name of the latter centre.

In Britain references began to appear in the literature from about 1000AD, and in 1192 the monk Richard of Devizes referred to the number of soap makers in Bristol and the unpleasant smells which their activities produced.

A century later soap making was reported in Coventry. Other early centres of production included York and Hull. In London a 15th century “sopehouse” was reported in Bishopsgate, with other sites at Cheapside, where there existed Soper’s Lane (later renamed Queen Street), and by the Thames at Blackfriars.⁵

Early means of manufacture

Throughout its long history the chemical process for the production of soap has not fundamentally changed. Neutral oils or fats are boiled with alkali in a reaction which produces soap and glycerin. Potassium salts produce soft soaps whereas sodium soaps are harder and more widely employed. When the metallic radical is calcium or magnesium, then insoluble soaps are produced, which form the scum produced when soap dissolves in hard water. The quality of soap produced is very dependent on the quality of the materials employed in the reaction. Early attempts at soap production relied on ash, produced by burning various vegetable materials, as a makeshift source of alkali. For example, in Spain, the plant *salsola* was burned to produce an alkaline ash called *barilla*. This, used in conjunction with locally available olive oil, offered a good quality soap which, by salting-out or “graining” the boiled liquor with brine, allowed the soap to float to the surface, leaving the lye, vegetable colouring and impurities to settle out. This produced what was probably the first white hard soap: *Jabon de Castilla*, or Castile soap, also known to pharmacists as *Sapo hispaniensis* or *Sapo castilliensis*. Originally an important product for the Castile region of central Spain, Castile eventually became the generic name for hard, white, olive oil soaps.⁷

Soap production in Britain

In Britain early production of soap was usually based on rendered animal fat, such as tallow from beef or mutton. Later, growing imports of oils such as palm, coconut, olive, linseed and cottonseed oils offered a wider choice of raw materials and favoured production of soap in sea-ports such as London and Bristol. Production of soap in Bristol as early as the 12th century has already been referred to, and the “Proceedings, Minutes and Enrolments” of the Bristol Company of Soapmakers for the years 1562-42 survive in the local record office. These documents record the names of more than 180 individuals who were engaged in the trade, some being members of families in the business for successive generations. It is recorded that a type of black soft soap was known as “Bristol soap”. Another harder type, “Bristol grey soap”, was claimed to have been supplied in large quantities to London by 1523 at the price of one penny per pound.⁸ Volume production of soap in London probably dated from the 16th century.

Monopoly and taxation

The emergence of soap as a regular article of commerce did not escape the attention of those seeking to raise money from taxation. In 1632 Charles I granted letters patent to the Society of Soapmakers of Westminster, granting them a 14-year monopoly of the production of certain types of soap in return for payment of £4 per ton.

Bitter struggles followed and decrees of the Star Chamber resulted in the destruction of many soap pans outside the monopoly producers' locations. By 1636, the Star Chamber had decreed that there should be no soap manufacture outside a one-mile limit of London and Bristol. Production in the latter was restricted to 600 tons per annum,

whereas the Westminster Society had already covenanted to produce 5,000 tons of white soap per annum. The consequent destruction of the industry in Bristol was considerable.⁸

Taxation continued in various forms. During the Commonwealth period it stood at 4s per barrel. In the 18th and early 19th centuries, under a tax introduced under Queen Anne in 1712, the levy varied between 1d and 3d per pound, the higher figure being equal to the total cost of production.

All soap pans were required to be fitted with a padlock, of which the key was held by the exciseman. This official was required to be in attendance at each soap boiling, of which 12 hours' notice was required to be given. It was eventually Gladstone, as Chancellor of the Exchequer who, in a growing tide of Victorian concern about cleanliness, abandoned the soap duty in 1852, at an annual loss of £1,126,000 in tax revenue.⁹

The chemistry of soap

Glycerin was first observed by the Swedish chemist Scheele in 1779, who called it "the sweet principle of fat". But it was for the great French chemist, Michel Eugene Chevreul, born in 1786 and living to the age of almost 103, to study the chemistry of soap production and to identify "the sweet principle" as the common denominator of oils and fats and to name it "glycerine". Working in the first quarter of the 19th century, he showed that oils and fats are glycerides, and that boiling with caustic soda or caustic potash formed the salts of fatty acids, or soaps, liberating the glycerin, for which he obtained a manufacturing patent in 1811. This knowledge paved the way for the great expansion of soap manufacture later in the century, for which more assured sources of alkali were essential.

The British alkali industry

The first significant process for the large scale manufacture of alkali was invented by the French chemist Nicholas Leblanc, and its use in Britain commenced in 1823. Salt was reacted with strong sulphuric acid to give sodium sulphate, which was then heated with coal and lime to give sodium carbonate. Production of sulphuric acid was enabled by the lead chamber process, and sulphuric acid and soda manufacture formed the basis of the British heavy chemical industry. The next major development in alkali production was due to the American chemist Hamilton Young Castner. Born in New York in 1858, he moved to England in 1886. Seeking a means of producing pure caustic soda, Castner succeeded in using a mercury cathode to bring about the electrolysis of brine to produce caustic soda, chlorine and hydrogen. His invention was patented in 1892. Like his father and two brothers, Castner died of tuberculosis in 1899. An Austrian chemist, Carl Kellner, had patented a similar, though less effective, process in 1892. In order to avoid legal battles an agreement was reached between Castner and Kellner. The United Alkali Company (which used the Leblanc process) having turned down the rights to the new process, the Castner-Kellner Alkali Company was formed in 1895 and soon commenced the construction of new plant on a 46-acre site at Weston Point, Runcorn, near to the Salt Union works. The Salt Union agreed to provide up to 10,000 gallons of brine per day to enable the Castner-Kellner plant to produce 6,300 tons of pure caustic soda and 13,500 tons of bleaching powder per year.¹⁰

The expansion of soap production

An early entrant into the quality soap business was Andrew Pears. A West Country man who had opened a barber's shop in Gerrard Street, Soho, Pears became interested in the production of better quality soap. In 1789, he commenced production of a transparent soap at a factory in Wells Street, off Oxford Street. In 1835 his grandson, Francis Pears, joined him in the business to form A&F Pears. The company was awarded the prize medal for soap at the Great Exhibition in 1851. A factory was opened at Isleworth in 1862. In 1865 the son of Francis Pears, Andrew, joined his sister's husband Thomas Barratt as joint proprietor, with Andrew running the factory and Thomas in charge of the London headquarters. Thomas Barratt was a pioneer of modern advertising and business management, investing funds in the promotion of his product as an aid to health and beauty. Those whom he persuaded to give testimonials included Theophilus Redwood, professor of pharmacy at the Society's school of pharmacy, Erasmus Wilson, president of the Royal College of Surgeons and the noted actress and society beauty, Mrs Lillie Langtry. His promotional campaigns included use of the painting Bubbles by Sir John Everett Millais, which became the most famous poster in the country, and the introduction in 1897 of years Shilling Cyclopaedia'. Many millions of copies of this annual publication have been sold and it remains in print. Barratt has been called "the father of modern advertising" and his initiatives propelled Pears Transparent Soap to the status of a major manufactured product at home and overseas. Following his death shortly before the 1914 war, A&F Pears Ltd joined Lever Brothers and production was later moved to Port Sunlight.¹¹

Some other soap manufacturers

William Gossage was born in 1799 and apprenticed to his uncle, a chemist and druggist in Chesterfield, later opening his own pharmacy in Leamington. In 1830, he joined an alkali company in Worcestershire and following experience in chlorine production, white lead manufacture and copper smelting he moved to Widnes in 1850. In 1853, he patented a process for the production of caustic soda from sodium carbonate and the following year turned his attention to soap manufacture. Gossage's low-price good quality soap became very successful and his soap works became the largest in England. He died in 1877. Happily, his factory, situated by the Mersey, close to the Runcorn-Widnes bridge, can still be visited. It now provides premises for "Catalyst" - the museum of the chemical industry. The museum is open daily (except Mondays) and the extensive displays include the history and products of Gossage's. The company eventually joined Lever Brothers.

The chemist and druggist R. S. Hudson began manufacturing a soap powder in the back of his shop in High Street, West Bromwich, in 1837, initially by grinding the soap with a mortar and pestle. By 1854 he was employing 10 young women in the production process and in 1875 he opened a factory at Bank Hall, Liverpool. Hudson's soap became very successful and famous names like "Rinso" and "Omo" originated from the company. It became part of Lever Brothers in 1908.

Port Sunlight

William Hesketh Lever and his brother James, sons of a wholesale grocer in Bolton, bought a small soap works in Warrington in 1885. Using vegetable oils like palm oil, rather than tallow, to manufacture soap and glycerin, they produced a good, free-lathering soap which proved popular. By 1888 output had increased to 450 tons per week and larger premises for the manufacture of “Sunlight Soap” were constructed on marshes at Bromborough Pool by the Mersey opposite Garston Docks. “Port Sunlight” had arrived. By the end of the century “Sunlight Soap” had been joined by “Lifebuoy”, “Lux” and “Vim” among other products and overseas activities had been established in the United States, Switzerland, Canada, Australia, Germany and elsewhere. By 1911 the company was cultivating its own coco palm plantations in the Congo and the Solomon Islands. The 1914 war was followed by world-wide expansion and the consolidation of soap production in Britain. Lever Brothers Ltd acquired, in addition to A&F Pears, Gossage’s and Hudson’s, already mentioned, the Vinolia Company, Hazlehurst & Sons of Runcorn, the old established firms Edward Cook of London, Christopher Thomas & Bros Ltd of Bristol, and such famous names as the Erasmic Co, John Knight Ltd, Price’s, D&W Gibbs and Joseph Watson & Sons of Leeds. During the 19th century soap manufacture was a very fragmented activity. Many old plans of towns all over the country provide evidence of small local soap works, and some housewives in rural areas would still make their own soap in the home. By the mid-20th century soap manufacture in Britain had been substantially consolidated by Lever Brothers into a

modern, large-scale manufacturing industry. William Hesketh Lever, the first Lord Leverhulme, died in 1925 and was succeeded by his son, the second viscount, a prominent member of the Society of the Chemical Industry.¹²

Manufacturing methods

Traditional soap manufacturing methods involved the boiling of oils and fats with caustic solution in open pans of a capacity anywhere between 10 and 150 tons, followed by the addition of salt or brine in the “salting out” process, in which the soap separated from the lye. The skilled operator would control the process by “trowelling”. From the way the soap slid from a heated hand trowel he could judge whether more brine or caustic was required and when the batch was ready for “settling”. By successive washing in brine the lye was separated from the soap and the glycerin recovered. The soap was dried and cut into bars for supply to the wholesale and retail trade. In former times the retailer would cut the bars into individual blocks at the point of sale, using cheese wire or a sharp knife, and would hand wrap the blocks in paper. It is of interest that the description “a bar of soap” persists, although the product is now normally purchased in individual tablets and a true soap-bar is a rare sight. Traditional transparent soap such as “Pears” is produced by prolonged evaporation and drying from an alcoholic liquid soap in a process taking up to three months. The characteristic concave shape of the soap tablet is achieved not by moulding but by shrinkage in the drying process. Modern soap manufacture, by contrast, is by continuous processes supported by instrumentation and automated control systems.

Soap and pharmacy

In addition to the traditional sale of many kinds of soap products by pharmacists through retail outlets, soap itself has found numerous applications in pharmacy, such as pill making, lotions and liniments, dentifrices, plasters, enemas, suppositories and poultices, in addition to veterinary applications. Older pharmacists will recall sessions in the pharmaceuticals laboratory preparing Sapo mollis and Spiritus saponis, and perhaps their first embarrassing experience as a young apprentice when asked for Opodeldoc, until a patient pharmacist explained that this was to be found in a winchester labelled Linimentum saponis.

The use of soap in pharmacy is long established. In 1761 Quincy's English Dispensatory recommended that "those kinds of soap which are most appropriate for medicinal purposes, and given inwardly, are from Venice or from Castile". In 1768 the Experimental History of Materia Medica by William Lewis, FRS, claimed: "The finest of the common soaps is that called Spanish or Castile soap, which is made with olive oil and the alkaline salt called soda or barilla." Although advances in the chemistry of surface active agents in the 20th century have been remarkable and have revolutionised approaches to the manufacture of household and industrial cleansers, laundering

agents, shampoos and other cosmetics, traditional soaps have retained their popularity for washing and bathing, and soap may well see another century of large scale manufacture and everyday use.

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