soluble silicate itself is a powerful detergent, and it possesses certain advantages when used with hard waters, so that, taking its cheap­ness into account, the question whether its introduction into soap is a fraud may be fairly discussed and much said in its defence.

*Framing.—*The frames into which hard soaps are ladled for cooling and solidification consist of rectangular boxes made of iron plates and bound and clamped together in a way that allows the sides to be removed when required. The solidification is a very gradual pro­cess, depending, of course, for its completion on the size of the block ; but before cutting into bars it is essential that the whole should be set and hardened through and through, else the cut bars would not hold together. Many ingenious devices for forming bars have been produced ; but generally a strong frame is used, across which steel wires are stretched at distances equal to the size of the bars to be made, the blocks being first cut into slabs and then into bars.

*Soft* *Soap.—*As already said, soft soaps are made with potash lyes, although in practice a small quantity of soda is also used to give the soap some consistence. There is no separation of underlyes in potash soap, consequently the product contains the whole consti­tuents of the oils used, as the operation of salting out is quite im­practicable owing to the double decomposition which results from the action of salt, producing thereby a hard principally soda soap with formation of chloride of potassium. Owing to this circum­stance it is impossible to “fit” or in any way purify soft soap, and all impurities which go into the pan of necessity enter into the finished product. The making of soft soap, although thus a much less complex process than hard soap making, is one that demands much skill and experience for its success. From the conditions of the manufacture care must be taken to regulate the amount and strength of the alkali in proportion to the oil used, and the degree of concentration to which the boiling ought to be continued has to be determined with close observation.

*Toilet Soaps,* &c.—Soaps used in personal ablution in no way differ from the soaps previously alluded to, and may consist of any of the varieties. It is of consequence that they should, as far as possible, be free from excess of alkali and all other salts and foreign ingredients which may have an injurious effect on the skin. The manufacturer of toilet soap generally takes care to present his wares in convenient form and of agreeable appearance and smell ; the more weighty duty of having them free from uncombined alkali is in many cases entirely overlooked. Transparent soaps are prepared by dissolving ordinary soap in strong alcohol and distilling off the greater portion of the alcohol till the residue comes to the condi­tion of a thick transparent jelly. This, when cast into forms and allowed to harden and dry slowly, comes out as transparent soap. A class of transparent soap may also be made by the cold process, with the use of cocoa-nut oil, castor oil, and sugar. It generally contains a large amount of uncombined alkali, and that, with its unpleasant odour of cocoa-nut oil, makes it a most undesirable soap for personal use. Toilet soaps of common quality are perfumed by simple melting and stirring into the mass some cheap odorous body that is not affected by alkalis under the influence of heat. The finer soaps are perfumed by the cold method ; the soap is shaved down to thin slices, and the essential oil kneaded into and mixed with it by special machinery, after which it is formed into cakes by pressure in suitable moulds.

Glycerin soap ordinarily consists of about equal parts of pure hard soap and glycerin (the latter valuable for its emollient properties). The soap is melted by heat, the glycerin is stirred in, and the mixture strained and poured into forms, in which it hardens but slowly into a transparent mass. With excess of glycerin a fluid soap is formed, soap being soluble in that body, and such fluid soap has only feeble lathering properties. Soap containing small proportions of glycerin, on the other hand, forms a very tenacious lather, and when soap bubbles of an enduring character are desired glycerin is added to the solution. Soaps are also pre­pared in which large proportions of fine sharp sand, or of powdered pumice, are incorporated, and these substances, by their abrading action, powerfully assist the detergent influence of the soap on hands much begrimed by manufacturing operations.@@1

*Medicated soaps* contain certain substances which exercise a specific influence on the skin. A few medicated soaps are prepared for internal use, among which are croton soap and jalap soap, both gentler cathartics than the uncompounded medicinal prin­ciples. Medicated soaps for external use are only employed in cases of skin ailments and as prophylactic washes. Among the principal varieties are those which contain carbolic acid, petro­leum, borax, camphor, chlorine, iodine, mercurial salts, sulphur, and tannin. Arsenical soap is very much employed by taxider­mists for the preservation of the skins of birds and mammals. It consists of a mixture of white arsenic, hard soap, and slaked lime, say 4 oz. of each, with 12 oz. of carbonate of potash, the whole being made into a stiff paste with water.

The following table indicates the average composition of several commercial soaps :—

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Water. | Fatty  Acid. | Soda. | | Potash. | Soluble  Silica. | Glycerin. | Other Salts. | Loss. |
| Com­  bined. | Free. |
| Tallow soap .... Marseilles soap, | 28∙8 | 58∙0 | 6∙8 | l∙6 | .. | .. | .. | 2∙3 | 2∙5 |
| mottled | 10∙15 | 76∙0 | 8∙65 | 0∙25 | .. | .. | .. | 4∙95 | |
| Palm-oil soap .. | 35∙4 | 49∙9 | 7∙0 | 1∙0 | .. | .. | .. | 1∙1 | 5∙6 |
| Yellow soap .. | 22∙23 | 62∙95@@2 | 8∙03 | .. | .. | .. | .. | 6∙79 |  |
| Cocoa-nut oil soap | 58∙74 | 32∙82 | 4∙26 | 1∙50 | .. | .. | .. | 2∙26 | 0∙42 |
| Silicate soap .... | 50∙4 | 5∙5 | 10∙7 | .. | .. | 33∙4 | .. | .. | .. |
| Soft soap | 43∙3 | 41∙9 | .. | .. | 10∙2 | .. | 4∙6 | .. | .. |

*Soap Analysis.—*Here it will be sufficient to mention a few tests which can be executed without special chemical knowledge. To de­termine the water in a soap—a most important question—a few thin slices are weighed and dried in a stove at 105°C. so long as loss of weight continues. The loss of weight is the measure of uncombined water in the sample. Added salts, such as alkaline silicates, sul­phates, &c. and insoluble earthy admixtures are detected by boiling a sample with alcohol, in which only the soap proper dissolves. The residue is collected in a filter, washed with hot alcohol, and weighed. An excessive proportion of surplus alkali can be detected by dissolving the soap in hot water and adding a sufficiency of saturated solution of common salt to salt it out. The alkali remains in solution and can be determined by the amount of a standard acid solution it neutralizes.

*Commerce.—*Marseilles has long been recognized as the most im­portant centre of the soap trade, a position that city originally achieved through its ready command of the supplies of olive oil. The city is still very favourably situated for obtaining supplies of oils both local and foreign, including sesame, ground nut, castor oil, &c. In England the soap trade did not exist till the 16th century. In the reign of Charles I. a monoply of soap-making was farmed to a corporation of soap-boilers in London,—a proceed­ing which led to serious complications. From 1712 to 1853 an excise duty ranging from 1d. to 3d. was levied on soap made in the United Kingdom, and that heavy impost (equal when 3d. to more than 100 per cent.) greatly impeded the development of the industry. In 1793, when the excise duty was 21/4d. on hard and 13/4d. on soft soap, the revenue yielded was a little over £400,000 ; in 1815 it was almost £750,000 ; in 1835, when the duty was levied at 11/2d. and 1d. respectively (and when a drawback was allowed for soap used in manufactures), the revenue was almost £1,000,000 ; and in 1852, the last year in which the duty was levied, it amounted to £1,126,046, with a drawback on exportation amount­ing to £271,000. What the manufacture has risen to since that time there is no accurate way of estimating. (W. D.—J. PA.)

SOAP BARK. A vegetable principle known as “sap­onin,” and chemically analogous to the arabin of soluble gums and to mucilage, forms with water a lather, and is on that account available as a substitute for soap. Saponin is obtainable from soap nuts, the fruit of a tree, *Saponaria officinalis* and allied species; but its most important source is the Quillai bark of Chili yielded by a large tree, *Quillaja saponaria.* The inner bark of the tree, reduced to powder, is employed in Chili as a substitute for soap.

SOBIESKI, John, king of Poland. See John III., vol. xiii. p. 714, and Poland, vol. xix. p. 295.

SOCAGE is a form of tenure. Bracton, Britton, and other old writers derived the word from the French *soc,* “ a ploughshare.” Modern etymologists, however, prefer to derive it from the Old English *soc,* “ a franchise ” or “ privi­lege,” or the land over which such franchise or privilege was exercised. Socage differs from knight service in being agricultural rather than military in its nature, and from frankalmoign in being based on temporal rather than spiritual services. It is either free or villein. Free socage *in capite* was abolished by 12 Car. II. c. 24. That form of free socage called common socage is the ordinary modern freehold tenure. Varieties of it are burgage, gavelkind, and petit serjeanty. Scutage, while it existed, was another variety. The only representative of villein socage is the comparatively rare tenure of ancient demesne confined to manors, described in Domesday Book as *terræ regis.* Socage tenure is said to have formerly existed in Scotland. The descent of socage lands in Scotland seems to have been to all the sons equally, as was originally the case in England. (See Burgage, Gavelkind, Real Estate, Scutage.)

@@@1 “ Soap powders ” and “ soap extracts ” are simply preparations of alkalis.

@@@2 Including resin acids.