

and September. It rises to the height of two or three feet, shrubby and branching, with the lower part of the stems ligneous, and covered with a rough, striated, gray bark; but the upper branches are smooth, and of a pale green colour. The leaves are doubly pinnate; the pinnæ distant; and the leaflets obovate, sessile, decurrent, and very obscurely crenate, with the terminal one generally notched; the surface punctured, the texture rather thick, and the colour blueish green or glaucous. The flowers are produced in terminal branched corymbs on subdividing peduncles. The flower which opens first has a five-parted calyx, and a five-petalled corolla; but the others have the calyx four-parted only, and a four-petalled corolla. The petals are concave, wrinkled at the edge, of a pale greenish yellow colour, and very much spread: the stamens are awl-shaped, the length of the petals, and bearing small yellow quadrangular anthers.* The germen is large, oval, punctured, deep green, with crucial furrows, and crowned with a short style and simple stigma: and the seeds are angular, rough, and blackish.

Qualities.—Rue leaves have a powerful unpleasant odour, and a hot, bitter, nauseous taste. In the recent state, the leaves possess so much acrimony as to inflame and blister the skin; but much of this is dissipated in drying. In distillation with water they yield a pungent volatile oil, on which their virtues chiefly depend: consequently, decoction is a bad form of preparation of rue.

Medical properties and uses.—Rue is stimulant, and antispasmodic; and is supposed to possess emmenagogue powers. It was in high estimation so early as the time of Hippocrates, who frequently ordered it in female complaints.[†] In modern practice it is chiefly used in hysteria and flatulent colic. I have found a strong infusion of it, exhibited per anum, of great service in relieving the convulsions of infants, arising from flatulence and other intestinal irritations. The dose of the powdered leaves is from grs. xv to ʒij, given twice or three times a day.

Official preparations. *Oleum Rutæ*, D. *Extractum Rutæ graveolentis*, E. D.

SABINÆ FOLIA. Vide *Juniperus*.

SACCHARUM. *Spec. Plant. Willd.* i. 122.

Cl. 3. Ord. 2. Triandria Digynia. Nat. ord. Gramina.

G. 122. *Calyx* two-valved, involucre, with a long lanugo. *Corolla* two-valved.

* These stamens display in a striking manner the spontaneous motions which take place in some plants. They are very stiff, and cannot be disturbed from the posture in which they happen to be; but nevertheless they rise, by a spontaneous movement, one or two at a time, and lean over the stigma till the pollen be shed, when they fall back again, and give place to others.

† De Morbis Mulier.

Spec. 4. S. officinarum. Common Sugar-Cane. Sloane's Jamaica, i. 101. t. 66. Phil. Trans. lxxix. 207—278. t. 3.

Officinal. SACCHARUM. SACCHARUM PURIFICATUM. Lond. SACCHARUM. a. non purificatum. b. purificatum. c. syrupus empyreumaticus. Edin. SACCHARUM PURIFICATUM; SACCHARUM RUBRUM, EJUSDEMQUE SYRUPUS. (Molasses.) Dub. Unrefined Sugar. Refined Sugar. Molasses.

Syn. Sucre; Sucre-pur (F.) Zucker; Weisser Zucker (G.) Zucchero brutto; Zucchero in pane; Melassa (I.) Azúcar; Atriaca (S.) Shukhir (Arab.) Chenec (H.) Sakkara (San.)

The common sugar-cane is a native of both the East and West Indies. It is cultivated in Persia, and very abundantly in the West Indies. The root is jointed, and sends up several jointed stems, which rise in general to the height of eight or ten feet. A leaf springs from each joint, and the base of it embraces the stem to the next joint above its insertion, before it expands. From this point each leaf is about three or four feet long, and comparatively narrow, like a blade of grass; with the midrib broad, and prominent on the under side, and the edges thin, and sharply toothed. The flowers are in terminal panicles, two or three feet in length, and composed of subdivided spikes, with long flexuose down or lanugo, which incloses the flowers, and hides them from the sight. The seed is oblong-pointed, and ripens in the valves of the flowers.

Although the sugar-cane is undoubtedly a native of the American continent and its islands, yet the culture of it, and the art of making sugar, were carried from Spain to the Canary Islands, and thence extended, about the end of the fifteenth century, to the West Indies and the Brazils; the former of which supplies the greater part of the consumption of Europe¹, a small proportion only being brought from the East Indies. The quantity of sugar yielded by the plant is varied by climate: thus, the Otaheitean cane contains more crystallized matter than that of any other place.

In the West Indies the plant is propagated by cuttings of the stalk, taken from near its top, and laid horizontally in the ground. The canes are cut, for the purpose of making sugar, between the sixth and thirteenth month of their growth, when the stems have acquired from seven to ten feet in height, a proportionable size, and the cuticle appears smooth, dry, and brittle. This generally happens in the months of February, March, and April. As soon as they are cut, the canes are stripped of their leaves, and crushed between iron rollers, to express the juice, which is received into large leaden vessels, called *receivers*, whence it is immediately conveyed into a large copper vessel, named the *clarifier*, where it is mixed with lime, in

¹ The average importation into England and Scotland between 1787 and 1790, amounted annually to 1,952,262 cwt. *Moseley's Hist. of Sugar*, p. 154.

the proportion of one pint to 100 gallons of juice, and heated to the temperature of 140° .¹ A thick scum soon forms on the top, from under which the clear liquor is drawn off by a cock into a large copper boiler, where it is boiled till the bulk of the liquor is very considerably diminished. The boiling is successively repeated in four other coppers progressively smaller; and from the last, which is called the *teache*, it is conveyed into shallow wooden coolers, where it grains, and the concretion mass separates from the uncrystallizable matter or molasses. This mass is then put into empty hogsheads, having holes in the bottom, through each of which the stalk of a plantain-leaf is thrust; and when the molasses has drained off, the process is finished. In this state the sugar is brought home, under the name of *raw*, or *muscovado* sugar. In Europe, however, sugar undergoes another process for its purification. It is coarsely ground, dissolved in lime-water, and clarified with bullocks' blood; then boiled down to a proper consistency, the impurities being skimmed off as they rise, and poured into conical earthen vessels, where it is allowed to grain. The point of the cone is perforated; and the base covered with moist clay, the moisture of which percolates the sugar, and runs off through the perforated apex, which is placed undermost, carrying with it any uncrystallized impure syrup. In this state it is called *loaf* sugar; and requires a second purification before it is considered as completely *refined* sugar.

Qualities. — *Raw* or *muscovado* sugar is inodorous, and sweet to the taste. It is in concreted masses, consisting of small, dry, sparkling, irregular crystals of a yellowish colour. *Refined* sugar is also inodorous, and sweet to the taste. Its colour is pure white; and the mass or loaf in which it is concreted should be hard, extremely brittle, pulverulent, and persistent in the air. One hundred parts of sugar in its ordinary state contains, according to Berzelius, 5.3 of water: and it requires its own weight only of water at 48° for its solution. When united at a higher temperature with a smaller quantity of water, it remains dissolved, forming syrup. Four parts of boiling alcohol dissolve one part of sugar; but by rest a moiety of the sugar again separates in crystals. Oils also readily combine with it, and the mixture is miscible with water. Lime and the fixed alkalies unite with sugar, and form compounds, without any sweetness of taste. The concentrated strong acids dissolve and decompose sugar, but the weaker simply dissolve it; and the alkaline and earthy hydro-sulphurets, sulphurets,

¹ The lime extricates carbonic acid from the juice, and forms with the *herbaceous* or *feculent* matter an insoluble compound, which rises to the surface, and forms the scum.

and phosphurets, decompose it, and resolve it into a substance resembling gum.¹ Its ultimate constituents, according to the experiments of Lavoisier, are, 64 oxygen, 28 carbon, and 8 hydrogen, in 100 parts²: but according to Thenard and Guy Lussac, the proportions are oxygen 50.63, carbon 42.47, hydrogen 6.90, with which the last analysis of Berzelius nearly coincides.

Molasses has a peculiar odour, and a sweet empyreumatic taste. It is of a brown or black colour, thick, and viscid; and is constituted chiefly of the uncrystallizable part of the juice of the sugar cane, which Proust has denominated liquid sugar. It is more soluble in alcohol than sugar.

Medical properties and uses.—Raw sugar and molasses are laxative; and refined sugar externally applied is escharotic. All the kinds are extremely nutrient, and more generally used as articles of diet than for medicinal purposes; except it be to cover the taste of nauseous drugs. Sugar, however, is said to be a preventive of worms; and to prove useful in scurvy: but it is hurtful to those of bilious, hypochondriacal, and dyspeptic habit. But perhaps the most important use of sugar is as an antidote to the poison of verdegriis. It requires to be given in large quantities, both in the solid form and in solution in water. It appears to act chemically on the poison, and also by increasing the peristaltic action of the bowels.³

Official preparations. *Syrupi omnes.* L. E. D. *Trochisci omnes.* E. *Confectiones omnes.* L.

SAGAPENUM. Lond. Edin. Dub. Sagapenum.

Syn. Sagapenum (F.) Sagapengummi (G.) Sagapeno (I.) Sugbeenuj (Arab.) Kundel (H.)

This gum-resin which is brought to this country from Smyrna, Aleppo, and Alexandria, is the concrete juice of an unknown Persian plant. Dioscorides mentioned it as the juice of a ferula growing in Media⁴; and nothing more is known of its source at this day, although Willdenow supposes it to be the *Ferula persica*.⁵

Qualities.—Sagapenum has an alliaceous odour, and a hot, acrid, bitterish taste, not unlike that of *asafetida*, only weaker. It is in agglutinated drops or masses, of an olive, or brownish yellow colour, slightly translucent, and breaking with a horny fracture. It softens and is tenacious between the fingers; melts at a low heat, and burns with a crackling noise and white flame, giving out abundance of smoke, and leaving behind a

¹ Rollo on Diabetes, 452. Thomson's Chemistry, 4th ed. vol. iv. 660.

² A sugar in every respect resembling common sugar is obtained from the maple.

³ Vide *Traité des Poisons*, &c. Par M. P. Orfila, tom. i. p. 281.

⁴ Dioscorides, lib. 3. c. 95. (*Sagapenum*.)

⁵ This plant was fully described by Dr. Hope, as the plant which yields the *asafetida*, which, however, is the produce of another species. See *Phil. Trans.* lxxv. 36. t. 3, 4.

light spongy charcoal. Water and strong alcohol dissolve it partially; but it is almost completely soluble in proof spirit. In distillation with water it yields a little volatile oil; and impregnates the water strongly with its flavour. Its constituents appear to be gum, resin, and an essential oil, on which its virtues probably depend.

Medical properties and uses. — This gum-resin is antispasmodic, and emmenagogue; and externally discutient. It is sometimes employed in hysteria, chlorosis, and other cases in which asafetida has been found serviceable; but it is much inferior in its powers. It is usually given in substance, in doses of from grs. x. to ʒss. made into pills.

SALIX. *Spec. Plant. Willd.* iv. 703.

Cl. 22. *Ord.* 2. Dioecia Diandria. *Nat. ord.* Amentaceæ.

G. 1756. Male. *Amentum* cylindrical. *Calyx* a scale. *Corolla* none. *Gland of the base* nectariferous.

Female. *Amentum* cylindrical. *Calyx* a scale. *Corolla* none. *Style* bifid. *Capsule* one-celled, two-valved. *Seeds* downy.

* with smooth serrated leaves.

Species. 10. *S. fragilis.* Crack Willow. *Smith Flora Brit.* 1051. *Med. Bot.* 2d edit. 18. t. 8. *Hoffman Sal.* ii. 9. t. 31.

*** with villose leaves.

Species. 33. *S. alba.* White Willow. *Smith Flora Brit.* 1071. *Hoffman Sal.* i. 41. t. 7, 8.

Species 101. *S. caprea.* Great round leaved Sallow. *Smith Flora Brit.* 1067. *Hoffman Sal.* i. 25. t. 3. f. 1.

1. SALIX FRAGILIS.

Official. — CORTEX. *Dub.* Bark of the Crack Willow.

Syn. Ecorce de Saule (F.) Weidenrinde (G.) Corteccia di Salcio (I.) Corteza de sauce (S.)

This species of willow is indigenous, growing upon the banks of rivers, and flowering in April and May. It grows to a considerable height, sending off upright branches; which are covered with an even brownish yellow bark, and are very fragile at the base. The leaves are petiolate, from three to five inches in length, lanceolate, pointed, obtusely serrated, inflexed, and glandular; smooth on both surfaces, shining on the upper; and in the younger ones, ciliated at the apex. There are sometimes no stipules; but when present they are rounded, and obscurely toothed. The male catkin is pale, cylindrical, rather lax, with ovate, downy scales. The nectary is composed of two yellow glandular scales, the larger between the stamen and the receptacle, and the smaller between the stamen and the scale. The stamens are two, filiform, and smooth. The female catkin resembles the male; with the germin egg-shaped, supporting two bifid, erect stigmas. The capsule is ovate, and contains many small seeds. The bark requires to be dried in an oven moderately heated.

Qualities. — The dried bark is inodorous, bitter and austere.

2. SALIX ALBA.

Official. SALIX; CORTEX. *Dub.* Willow Bark.

The white willow is indigenous, growing in woods and moist places, and flowering in April and May. It is a large tree, with a cracked bark; and furnished with many round, spreading branches; the younger of which are silky. The leaves are alternate, on short petioles, lanceolate, pointed, acutely and regularly serrated, with the lower serratures remote and glandular: pubescent on both sides, and silky beneath: the younger ones are altogether silvery, and convoluted. There are no stipules. The catkins are terminal, cylindrical, elongated, slender, and many flowered, with elliptical, lanceolate, brown, pubescent scales. The stamens are yellow, and a little longer than the scales: the style is short; and the stigmas bipartite and thick. The capsules are nearly sessile, ovate, brownish, and smooth.

The bark of this species is easily separated all the summer. It has been used for tanning leather; and the inner part of it affords the miserable inhabitants of Kamschatka a substitute for bread.

Qualities. — The same as those of the former species.

3. SALIX CAPREA.

Official. SALICIS CORTEX. *Lond.* Willow Bark.

This species of willow is indigenous, very common in woods, flowering in April. It is a middling-sized tree, with the branches round, even, shining, and brownish; and the shoots pubescent. The leaves are alternate, petiolate, and varying in shape, being sometimes elliptical or roundish, pointed, large, undulated, waved, or serrated; smooth and dark green on the upper surface, and densely tomentose and veined on the under. The stipules are crescent-shaped or roundish, recurved, waved, and tomentose. The petioles are linear, and densely villose. The catkins appear before the leaves, are ovate, thick, many-flowered, with obovate, very hairy scales. The stamens are yellow: the stigmas nearly sessile, undivided, but at last occasionally cleft. The capsules are pedicelled, ovate, bellied at the base, and downy.

Qualities. — The bark of this species, like that of the two former, is inodorous, bitterish, and astringent.

The bark of the white willow only has been chemically examined; but as the other two species agree with it in their sensible qualities, it is probable that they agree also in other respects. Water extracts its virtues, and affords a decoction of a reddish colour, which is precipitated by a solution of isinglass, the carbonate of potash and of ammonia; and by lime-water, which throws down a precipitate at first blue, and af-

terwards buff-coloured: sulphate of iron also produces a dark green precipitate. The watery extract is reddish, brittle, has a bitter taste, and does not deliquesce. Digested in alcohol this bark affords a greenish yellow tincture, which water renders turbid. When evaporated, the extract is of a bright yellow colour, bitter, melts at a moderate heat, and emits an aromatic odour.¹ The constituents, therefore, of white willow bark, and probably of the two other species also, are tannin, bitter resin, extractive, and gluten.

Medical properties and uses. — These barks are tonic, and astringent. They have been given as a substitute for the cinchona bark; and in some cases intermittents and remittents have yielded to their use.² They have also been efficaciously administered in cases of debility, dyspepsia, and pulmonary hemorrhagies; and have apparently been more serviceable in phthisis and hectic fever than the cinchona. They may be given either in substance, or in the form of decoction. Of the powdered bark from ʒss. to ʒj. may be given for a dose, combined with aromatics, myrrh, or the cinchona bark, as circumstances direct.

SALVIA. *Spec. Plant. Willd.* i. 127.

Cl. 2. *Ord.* 1. *Diandria Monogynia. Nat. ord. Verticillatæ Linn. Labiatæ Juss.*

G. 63. *Corolla* unequal. *Filaments* affixed transversely to a pedicel. *Species* 7. *S. officinalis.*³ *Garden Sage. Med. Bot. 2d ed.* 352. t. 127.

Officinal. **SALVIE OFFICINALIS FOLIA.** *Edin. SALVIA. Dub.*

The leaves of Sage.

Syn. *Sauge* (F.) *Salbei* (G.) *Salvia* (L.) *Salvia* (S.) *Says-elley* (Tam.) *Saulbëy* (Pers.)

The common or officinal sage is a perennial plant, a native of the South of Europe, cultivated abundantly in our gardens, flowering in June. It rises about two feet in height, with a quadrangular, shrubby, branching stem: the younger branches whitish, and downy. The leaves, which stand in pairs on footstalks, are ovate-lanceolate, wrinkled, crenate, and sometimes tinged reddish or purple. The flowers are on long terminal spikes, in six-flowered distant whorls, accompanied with ovate, acute, deciduous bractes. The calyx is striated, purplish on the upper part, and notched into three acute teeth above, and two below: the corolla is tubular and bilabiate, of a beautiful blue variegated with purple and white; the upper lip obtuse, notched, and concave, the under three-lobed, the lateral

¹ *Ann. de Chimie.* liv. 290. *Thomson's Chemistry,* 4th ed. vol. v. p. 221.

² The bark of the white willow was first used by the Rev. Edmund Stone, of Chipping Norton, Oxfordshire. He gave it successfully in doses of one drachm of the powder every hour between the paroxysms, in tertians; and added one-fifth of the Peruvian bark to augment its power, in obstinate quartans. *Phil. Trans.* iii. 195.

³ *Ελισιφάγον* Dioscoridis.

lobes bent backwards. The filaments are affixed transversely at their middle to short pedicels, on a moveable axis, and are curved threads bearing a gland on the lower end, and on the upper a yellow oblong anther: the style is long, curved, purple with a bifid stigma, and rising from the centre of four naked seeds in the bottom of the calyx.

There are many varieties of common sage, but their properties are the same. It is cut when in flower, and hung up in a shady place to dry.

Qualities.—The odour of sage is fragrant, and the taste warm, bitterish, and aromatic: qualities depending on an essential oil which can be obtained separate in distillation with water. Sulphate of iron strikes a deep black colour with the infusion.

Medical properties and uses.—Sage is tonic, carminative, and slightly astringent. The estimation in which it was held by the antients is sufficiently well known; but it does not support the character it formerly acquired; and “*salvia salvatrix naturæ conciliatrix*”¹ is very little regarded by the modern practitioner. Infusions of the leaves, if strained before too much of the bitter is extracted, prove very grateful to the stomach, when nausea is troublesome in febrile complaints; and when drunk cold they are said to check hectic perspirations², and those which frequently attend convalescencies. The infusion either alone, or mixed with honey and vinegar, is a well known gargle in cases of sore throat, and relaxation of the uvula. The dose of the pulverized leaves is from grs. xv. to 3ʒs; or, of an infusion made with ʒj of the dried leaves and ʒj of boiling water, f ʒij may be taken every three or four hours.

SAMBUCUS. *Spec. Plant. Willd.* i. 1494.

Cl. 5. *Ord.* 3. Pentandria Trigynia. *Nat. ord.* Dumosæ Linn. Caprifoliæ. Juss.

G. 569. Calyx five-parted. Corolla five cleft. Berry three-seeded. *Species* 3. *S. nigra*.³ Common Elder. *Med. Bot.* 2d ed. 596.

Smith Flora Brit. 336. *Engl. Bot.* 476.

Officinal. SAMBUCI FLORES. *Lond.* SAMBUCI NIGRÆ FLORES; BACCÆ CORTEX. *Edin.* SAMBUCUS; CORTEX INTERIOR, FLORES, BACCÆ. *Dub.*

The flowers, berries, and inner bark of Common Elder.

Syn. Sureau ordinaire (*F.*) Fliederblumen (*G.*) Corteccia; bacche, e fiori di Sambuco (*I.*) Sabuco (*S.*) Uktee (*Arab.*)

The common elder is a very abundant, indigenous, middle-sized shrubby tree, growing commonly in hedges; flowering in June, and ripening its berries in September. It is much branched near the top, and covered with a roughish gray bark.

¹ *Schola Saleritana*, c. 38, p. 406.

² *Van Swieten's Comment.* ii. 370.

³ *Aster* Dioscoridis. The leaves laid in the subterraneous passages of moles are said to drive them away.

The wood is white, hard, and has a large spongy pith. The leaves are pinnate, composed of five oval, pointed, serrated leaflets, nearly equal at their base. The flowers are in terminal cymes, consisting of five principal branches, and many small ones, with some of the flowers sessile. They are cream-coloured; with the calyx superior, and permanent, and the corolla monopetalous, rotate, and somewhat convex. The berries are globular, and when ripe of a purplish black colour.

Qualities. — The flowers have a peculiar faint sickly odour and bitterish taste, which are imparted to water by infusion, and also by distillation, in which a small portion of butyraceous oil is separated. The berries are inodorous, have a sweetish taste; and yield on expression a fine purple juice, which contains saccharine matter, jelly, and the malic acid. The inner bark is inodorous, and has a faint sweetish taste, which is succeeded by a slight bitterness, and a very permanent acrimony. Both water and alcohol extract their virtues.

Medical properties and uses. — The flowers and berries are diaphoretic and aperient. The berries were formerly much used in febrile diseases, rheumatism, gout, and eruptive diseases, but they are now scarcely ever ordered. The flowers are used chiefly in fomentations and cooling ointments; and to afford their odours to water in distillation. The bark is a hydragogue purgative, and in large doses proves emetic at the same time. It is said to prove useful in dropsy; and in smaller doses to be a useful aperient and deobstruent in various chronic affections. The dose of the bark is from grs. x. to ʒss. given in wine: or ʒj may be boiled in Oij of milk or of water down to Oj, and the fourth part taken for a dose.

Official preparations. *Succus spissatus Sambuci nigrae*. E. D. *Unguentum Sambuci*. L. D.

SAPO. Soap.¹

Soap is a compound of margaritic and oleic acids² with an alkaline, or an earthy, or an oxidized metalline base. The first kind is that which is employed in medicine, and has been longest known, having been invented by the Gauls at a period antecedent to historical record. Alkaline soap is of two kinds; one made with soda, and oil either animal or vegetable, or tallow, and called *hard soap*; the other made with potash and similar oily matters, and called *soft soap*. For medical pur-

¹ The name is derived, according to Beckman, from the old German word *Sepe*. — *History of Inventions*, iii. 239.

² Chevreul, whose experiments have elucidated the nature of soap more than those of any other chemist, has ascertained that fixed oils and tallow consist of two substances, one solid, which he has named *stearin*, and the other fluid, which he has named *eläin*. These are altered by salifiable bases, and converted into the above named acids, vide *Ann. de Chimie et de Phys.*

poses it is essential that both kinds be made from the purest materials; and therefore the soap made in countries which produce olive oil, as the south of France, Italy, Tripoli and Spain, is preferable to the soap of this country, which is generally manufactured from grease, tallow, and other kinds of fat.

1. HARD SOAP.

Official. SAPO DURUS. *Lond.* SAPO DURUS; *et soda confectus.* *Edin.* SAPO; DURUS HISPANICUS. *Dub.* Hard Soap. Spanish Soap.

Syn. Savon blanc (*F.*) Spanische Seife (*G.*) Sapone duro (*I.*) Xabon (*S.*) Nat Sowerum (*Am.*) Saboon (*Dub.*)

Hard soap is manufactured in Spain in the following manner: To five parts of barilla, coarsely ground to powder, one part of quicklime rendered fluid with a small portion of water, is added; and after some time the clear liquor, which is a strong solution of caustic soda, is drawn off, and called the *first ley*; with the residue more water is then mixed, and drawn off after some time, and called the *second ley*; and a *third ley* is procured by another portion of water treated in a similar manner. This last ley is then mixed with a quantity of olive oil equal in weight to the barilla employed, and the mixture boiled in an iron vessel, the second ley and a portion of the first being added in a gradual manner during the boiling. The boiling mixture is constantly stirred with a wooden pole, and when it becomes tolerably thick, a small portion of common salt is added, and the boiling continued for half an hour. The fire is then damped, and after some hours the clear liquor, which has separated, is drawn off, and the half-made soap again boiled with a little fresh water and the residue of the first ley. After the separation of the fluid of this boiling, it is again heated with a little water, and then poured into wooden vessels called frames, where it cools, and in a few days acquires a sufficient degree of hardness. Three parts of oil and three parts of soda produce five parts of firm soap.¹ Castile soap is made in the same manner, except that the marbled appearance which it presents is produced by the addition of sulphate of iron to a part of the alkaline ley, after the soap is fully boiled, which gives the blue colour; and the stirring in red oxide of iron, when the soap is almost made, gives the red colour.

Qualities. — Well made hard soap, fit for medical use, has very little odour, and a nauseous alkaliescent taste; is white, and of a firm consistence, does not feel greasy, and is devoid of any saline efflorescence on the surface. With water it forms a milky opaque solution; and with alcohol a nearly transparent, somewhat gelatinous solution.² It is decomposed by all the

¹ *Annales de Chimie*, xix. 253.

² The alcoholic solution of soap is a convenient test for discovering earthy salts in mineral waters.

acids, and by many neutral salts; hence hard water, which contains sulphate of lime, does not properly dissolve soap. According to the experiments of Darcet, Lelievre, and Pelletier, 100 parts of newly-made soap consist of 60·94 oil, 8·56 alkali, and 30·50 water: but part of the water is lost by keeping, and the soap becomes lighter.

2. SOFT SOAP.

Offical. SAPO MOLLIS. *Lond. Edin.* Soft Soap.

Syn. Savon Mou (F.) Sapone Molle (I.)

This soap is prepared in the same manner as the former, a caustic ley of potash, however, being used instead of the soda ley. It was this variety of soap which was originally made by the Gauls and Germans, who employed wood ashes to afford their ley; and these are still used in many places.

Qualities.—Soft soap differs from hard soap chiefly in its consistence, which is never greater than that of hog's lard.

Medical properties and uses.—Soap is regarded as purgative and lithontriptic; externally applied it is stimulant and detergent. For internal use the hard soap only is employed. It is occasionally ordered in habitual costiveness, and in jaundice, combined with rhubarb, or some bitter extract; but its power as a purgative is very limited, and it cannot act in any other way in relieving jaundice. It is more useful in calculous habits, in which, however, its action is altogether confined to the stomach; for as soap is decomposed by the weakest acids, its alkaline base corrects the acidity so prevalent in the stomachs of calculous patients, and thus at least assists in checking the increase of the disease. Soap is also beneficial in decomposing some metallic poisons when taken into the stomach; and, as it is the antidote which can most readily be procured, should always be early resorted to. It is necessary, in this latter case, to give it in solution; of which a teacupful should be drunk at short intervals, till the effects expected from it be produced. In other cases it is preferable to give it in substance. As an external remedy, soap is efficaciously used in frictions to sprains and bruises; and we have seen much benefit derived from rubbing the tumid bellies of children labouring under mesenteric fever, with a strong lather of soap every morning and evening. The dose internally is from grs. v. to ʒss. made into pills.

Offical preparations. *Pilulæ Saponis cum Opio.* L. *Emplastrum Saponis.* L. E. *Ceratum Saponis.* L. *Linimentum Saponis comp.* L. *Linimentum Saponis cum Opio.* E.

SARSAPARILLÆ RA'DIX. Vide *Smilax*.

SASSAFRAS LIGNUM ET RA'DIX. Vide *Laurus*.

SCAMMONIÆ GUM'MI RESINA. Vide *Convolvulus*.

SCILLA. *Spec. Plant. Willd.* ii. 125.

Cl. 6. Ord. 1. Hexandria Monogynia. Nat. ord. Coronariæ Linn.
Asphodeli Juss.

G. 640. Corolla six-petalled, spreading, deciduous. Filaments threadlike.

Species 1. *S. Maritima*.¹ Official Squill. Med. Bot. 2d ed. 745. t. 255.

Official. SCILLÆ RA'DIX. Lond. Dub. SCILLÆ MARITIMÆ RADIX.² Edin. Squill root (bulb.)

Syn. Scille (F.) Meerzwiebel (G.) Scilla (L.) Cebolla abarruna (S.)

This species of squill is a native of Spain, Sicily, Syria, and Barbary, flowering in April and May. The bulb is large, sometimes nearly the size of the human head, of a pear shape, and formed of fleshy scales, attenuated at both edges, and closely applied one over the other. The roots are fibrous, attached to a radical plate at the bottom of the bulb. The stem is round, smooth, and succulent, rising about three feet in height, from the centre of several radical, sword-shaped, straight, pointed, long leaves of a deep green colour. The flowers are produced in a long close spike upon purplish peduncles, with a linear, twisted deciduous bracte at the base of each. The corolla consists of six white ovate spreading petals, with a reddish mark in the middle of each: the filaments are shorter than the corolla, tapering, and furnished with oblong transversely placed anthers: the germen is roundish; the style and stigma are simple; and the capsule is oblong, smooth, three-celled, and contains many roundish seeds.

There are two varieties of the official squill, one with a white bulb, and the other with a reddish bulb; but both are indiscriminately used, and do not differ in their virtues. The bulbs are brought from the Levant, generally in bulk. They are preserved fresh in sand; but as they are apt to spoil, it is preferable to keep them in the dried state. (See *Preparations*.)

Qualities.—The squill bulb is inodorous; its taste is bitter, nauseous, and acrid; and when much handled it inflames and ulcerates the skin. The expressed juice reddens slightly litmus paper. The acrimony on which its virtue depends is partially dissipated by drying and long keeping, and completely destroyed by any heat above 212°: it is extracted by water, alcohol, and vinegar. The expressed juice when diluted with water, filtered, and boiled, does not yield flakes of albumen as has been stated.³ Nitrate of mercury and superacetate of lead

¹ Σκίλλα Dioscoridis. The trivial name *maritima* has been objected to, as it does not generally grow on the sea coast.

² All the Colleges have erred in designating the root as the official part of the squill. The bulb is the part employed.

³ But when the expressed juice is boiled till one half is dissipated a white precipitate is thrown down, which, when washed with alcohol, appears to be citrate of lime. *Annales de Chimie*, vol. lxxxiii. p. 149.

separate from the juice white curdy precipitates. Gelatin throws down a copious precipitate: and in a less degree the same effect is produced by lime water and the alkaline carbonates. Infusion of galls forms in it pale brownish flakes; sulphate of iron throws down a copious green precipitate: lime evolves ammonia. When the insoluble part of dried squill is digested in muriatic acid, filtered, and ammonia added in excess, a copious precipitate is thrown down, which is citrate of lime. Ether digested on dried squill acquires a pale green hue, and when evaporated on the surface of water a thin pellicle of very bitter resinous matter is deposited; while the water acquires an intensely bitter taste, and yields copious precipitates with solutions of acetate of lead and nitrate of silver. From these imperfect experiments, squills appear to contain extractive, a small portion of resin, mucus, carbonate of ammonia, the bitter principle, and citrate of lime. Vogel, from a careful analysis of squill, gives the following as its principles: 1. Gum 6. — 2. Bitter principle (scillitena) 35. — 3. Tannin 24. — 4. Citrate of lime 0. — 5. Saccharine matter 6. — Woody fibre 30. *

Medical properties and uses. — Squill in small doses is expectorant and diuretic; in larger doses, emetic and purgative. Its medicinal powers were very early known, and it still retains its character as a remedy of great efficacy when judiciously exhibited. Although it operates powerfully as an expectorant, yet from its stimulating properties it cannot be given with propriety in pulmonary inflammations, until the fever and inflammatory action be previously greatly subdued by bleeding, and other evacuations; after which, by promoting a more copious excretion from the mucous follicles, it rapidly unloads the chest, and relieves the congestion and difficulty of breathing. It is more useful when combined with nitrate of potass, tartarized antimony, or ipecacuanha; and in asthma and dyspnoea without fever, squill combined with ammoniacum is perhaps the best remedy we can employ. In dropsies, conjoined with a mercurial and opium, the efficacy of squill is well ascertained. Its diuretic powers are much increased by this combination; perhaps depending on the absorbents being powerfully excited by the mercury, while the squill determines to the kidneys. Cullen recommends¹ the oxymuriate of mercury as the best adjunct; but I have seen every purpose answered by calomel. Squill is a very uncertain emetic, a very small dose producing the most cruel vomiting in some persons, while in others the largest doses do not even excite nausea: where, however, it readily and

¹ *Annales de Chimie*, vol. lxxxiii. p. 159.

² *Materia Medica*, ii. 558.

moderately induces vomiting, it proves more useful in whooping cough and croup, than any other emetic. To produce its expectorant and diuretic effects most effectually, squill must be given in substance; but to excite vomiting, its infusion in vinegar, or the oxymel, is more usually employed. Of the dried squill gr. j. in the form of a pill, may be given at first for a dose, morning and evening, or every six hours; gradually increasing the dose to grs. v. or grs. vj, or until some degree of nausea is induced, and its expectorant or diuretic operation obtained.

Official preparations. *Acetum Scillæ*. L. E. D. *Oxymel Scillæ*. L. D. *Pilulæ Scillæ comp.* L. E. D. *Pulvis Scillæ*. E. D. *Syrupus Scillæ maritimæ*. E. *Tinctura Scillæ*. L. D.

SCROPHULARIA. *Spec. Plant. Willd.* iii. 269.

Cl. 14. Ord. 2. Didynamia Angiospermia. Nat. ord. Personatæ Linn. Scrophulariæ Juss.

G. 1152. Cal. 5-cleft. Corolla subglobular, resupine. Capsule 2-celled.

Species 2. S. nodosa. Knobby-rooted Figwort. *Smith Flora. Brit.* 663. *Engl. Bot.* 1544.

Official. SCROPHULARIA; HERBA. Dub. Figwort herb.

This is an indigenous, perennial plant, growing in woods and about hedges, flowering in July. The root is tuberous, and granulated. The stem rises three feet in height, is erect, simple, sharply quadrangular, smooth, and leafy. The leaves are opposite, petiolate, cordate, pointed, serrated, veined, smooth, cut at the base to the lateral veins, and as if three-nerved. The flowers are in terminal bunches, erect, with the peduncles opposite, dichotomous, and bracteolated. The flowers are of a dark blood-red colour. The capsules ovate.

Qualities.—The recent leaves have a rank fetid odour, resembling that of elder, and a bitterish disagreeable taste; but, both these qualities are nearly lost by drying. They yield their virtues to water: and the infusion precipitates sulphate of iron brown.

Medical properties and uses.—Figwort is supposed to possess diuretic and sedative properties. It has been used in scrophula, whence its name; and is recommended as a fomentation to piles, malignant tumors, spreading ulcers, and cutaneous eruptions: but it is very little known in practice.

SENEGÆ RADIX. Vide *Polygala*.

SENNÆ FOLIA. Vide *Cassia*.

SERPENTARIÆ RADIX. Vide *Aristolochia*.

SEVUM. Vide *Ovis*.

SIMAROUBÆ CORTEX. Vide *Quassia*.

SINAPIS.¹ *Spec. Plant. Willd.* iii. 554.

¹ *Sinapi* Dioscoridis.

Cl. 15. Ord. 2. Tetradynamia Siliquosa. Nat. ord. Siliquosæ Linn.
Cruciferae Juss.

G. 1246. Cal. spreading. Cor. claws erect. Gland between the shorter stamens and pistil, and the longer stamens and calyx.

Species 4. *S. alba*. White mustard. *Smith Flora Brit.* 721.

Species 5. *S. nigra*. Common mustard. *Med. Bot. t.* 151. *Smith Flora Brit.* 722.

1. SINAPIS ALBA.

Officinal. SINAPIS ALBÆ SEMINA. *Edin.* SINAPI; SEMINA. *Dub.*
White Mustard-seed.

Syn. Moutarde (F.) Senfsamen (G.) Senape bianca (I.) Grano de Mostaza (S.)

This species of mustard is an indigenous annual plant, growing in the fields and by road sides; but also much cultivated; and flowering in June. The root is spindle-shaped, and the stem round, strong, branched, and rising nearly two feet in height. The lower leaves are deeply pinnatifid; the upper ones sublyrate; and the whole rough with strong hairs on both sides, toothed, and of a pale green colour. The flowers are in racemes, with striated peduncles; the leaflets of the calyx are linear, and green; the petals yellow, with the claws narrow, and the border obovate and entire. The pods are spreading, on almost horizontal peduncles, hispid, roundish, ribbed, swelling where the seeds are placed, and furnished with a very long, ensiform, keeled, greenish rough beak. The seeds are large, for the size of the pod, globular, and of a light yellow colour.

2. SINAPIS NIGRA.

Officinal. SINAPIS SEMINA. *Lond.* Mustard-seeds.

Syn. Moutarde noir (F.) Schwarzer Senf (G.) Senape (I.) Mostaza nigra (S.)

Common mustard is an indigenous annual; and although very plentiful in its wild state, yet it is cultivated for domestic and medicinal purposes. It flowers in June. The root is small. The stem, which rises three or four feet in height, is very much branched, and spreading. The leaves are petiolate, variously lobed and toothed; those nearest to the root being rugged, while those of the stem are smooth; and the uppermost narrow, quite entire, and hanging down, which distinguishes it at first sight from its congeners. The flowers are yellow, and small. The calyx is coloured. The pods erect, parallel to the stem, short, quadrangular, frequently smooth, many-seeded, and furnished with a short quadrangular beak. The seeds are small, globular, and of a deep brown colour.

Although the seeds of these two species of mustard differ in their botanical characters, yet they agree in other respects, the common being only rather more pungent; and may be indiscriminately employed. Reduced to a fine powder, they form the common condiment every day used at our tables.

Qualities. — These seeds, in the entire state, are nearly inodorous, but when bruised they have a pungent, penetrating

odour. Their taste is bitterish, acrid, and biting. Unbruised mustard seeds, when macerated in boiling water, yield only an insipid mucilage, which, like that of linseed, resides in the skin: but, when bruised, water takes up all their active matter; although it is scarcely imparted to alcohol. In distillation with water, mustard-seeds yield a very acrid volatile oil, on which their virtues are supposed to depend. It is united in the seed with fecula or starch; its force appears to be obtunded by a soft, insipid, fixed oil, which can be separated by pressure, and the cake left after the expression is considerably more pungent and acrid than the unpressed seeds. It is not dissipated by drying, nor by keeping the seeds, and is rendered considerably more active by the addition of vinegar. When the seeds are triturated with lime, and a few drops of water, ammonia is plentifully evolved. Hence their constituents appear to be starch, mucus, a bland fixed oil, an acrid volatile oil, and an ammoniacal salt.

Medical properties and uses. — Mustard-seeds are stimulant, emetic, diuretic, and rubefacient. Swallowed whole, they have been found useful in dyspepsia, chlorosis, and the torpid state of the intestines which accompanies paralysis. The bruised seeds, or the powder, to the extent of a large teaspoonful mixed with water, form an excellent emetic in paralytic, epileptic, and some apoplectic cases, often operating quickly and fully when other emetics fail. In small doses they are found to promote considerably the secretion of urine, and consequently prove beneficial in dropsies. In these affections, however, perhaps the best mode of exhibiting mustard is in the form of whey, which is made by boiling ζ iv. of the bruised seeds in $\mathfrak{Oj}$ of milk, and straining to separate the curd. A fourth part of this quantity may be taken for a dose three times a day. But mustard is more frequently employed as an external remedy. The flour rubbed on the skin, or applied in the form of a cataplasm, made with crumbs of bread and vinegar, soon excites a sense of pain, considerable inflammation, and sometimes vesication. In these forms it has been found serviceable in paralysis; and applied to the soles of the feet in the delirium of typhus, and in comatose affections.

Official preparations. *Cataplasma Sinapis.* L. D.

SIUM. *Spec. Plant. Willd.* i. 1431.

Cl. 5. *Ord.* 2. Pentandria Digynia. *Nat. ord.* Umbellatæ.

G. 544. Fruit subovate, striated. *Invol.* many-leaved. *Pet.* cordate.

Spec. 4. *S. nodiflorum.* Procumbent Water Parsnip. *Med. Bot.*

2d edit. 139. *Smith Flora Brit.* 313. *Eng. Bot.* 639.

Official. *SIUM;* *HERBA.* *Dub.* Water Parsnip herb.

Syn. Berle; Ache d'eau (*F.*) Wasser-Partinake (*G.*) Sio; Gorgolestro (*I.*) Sio; Sion (*S.*)

This is an indigenous perennial plant, common in ditches

and brooks, flowering in July and August. The root is creeping. The stem procumbent or floating, branched, round, somewhat striated and leafy. The leaves are unequally pinnate, consisting of from 5 to 9 sessile, ovate, serrated leaflets. The umbels are solitary, nearly sessile, and opposite to each leaf. The umbellets are from 5 to 7, divaricated, and composed of twelve flowers. The involucre is of one piece, and often there is none. The involucre is ovate, concave, and the length of the pedicels. The calyx is scarcely visible; and the fruit ovate.

This plant has been omitted by the London College in the last edition of its Pharmacopœia; and we are inclined to believe that its pretensions even to the character of an antiscorbutic require further confirmation.

*SMILAX.*¹ *Spec. Plant. Willd.* iv. 774.

Cl. 22. *Ord.* 6. Dioecia Hexandria. *Nat. ord.* Sarmenaceæ Linn.

Asparagi Juss.

G. 1800. Male. *Calyx* six-leaved. *Corolla* none.

Female.—*Cal.* 6-leaved. *Cor.* none. *Styles* 3. *Berry* 3-celled. *Seeds* two.

* *Stem prickly, angular.*

Spec. 9. *S. Sarsaparilla.*² *Sarsaparilla. Med. Bot.* 2d edit. 161.

Officinal. SARSAPARILLÆ RADIX. *Lond. Dub.* SMILACIS SARSAPARILLÆ RADIX. *Edin.* Sarsaparilla root.

Syn. Racine de Salsepareille (*F.*) Sarsaparilla (*G.*) Radiche della Salsapariglia (*I.*) Zarzaparilla (*S.*)

This plant is a perennial, a native of South America and Virginia, flowering in July and August. The root is divided into pedicels, which are somewhat thicker than a goose-quill, straight, externally brown, internally white, and three or four feet in length. The stems are shrubby, long, slender, scandent, and beset with spines: the leaves alternate, ovate, pointed, and petiolate, with long tendrils at the base. The flowers stand three or four together upon a common peduncle. The calyx of the male flower is bell-shaped, with the segments oblong, spreading, and reflected at their points; the filaments are six, simple, and bearing oblong anthers: the calyx of the female flower is also bell-shaped; the germen ovate, supporting three minute styles, with oblong, reflexed, hairy stigmas; and the fruit a round three-celled berry, containing two globular seeds.

The dried root is imported from the Spanish West Indies, packed in bales. It is in long slender twigs, covered with a wrinkled brown bark, white within, and having a small woody heart.

¹ Σμίλαξ Dioscoridis.

² Bauhin derives the name from *Zarsa*, which, he says, is the Spanish for red; and *parilla*, a little vine. The latter part of the derivation is correct; but we are inclined to think the first part must be referred to *Zarxa*, a briar or bush; hence *Zarsaparilla* would imply a bushy little vine.

Qualities.— This root is inodorous, and has a mucilaginous, very slightly bitter taste. It communicates to boiling water, and partially to alcohol and ether, any active matter it possesses. The watery infusion has a brown colour, reddens litmus paper, and yields a precipitate with infusion of galls, which is again dissolved when the infusion is heated. It is precipitated also by lime-water, and solution of nitrate of mercury, and superacetate of lead, but is not affected by sulphate of iron, or any other of the metallic oxides. The alcoholic tincture has a yellowish red hue, is rendered turbid by the addition of water, and yields an extract slightly bitter, and pungent. Ether takes up two parts in ten of the powdered root; and the tincture, which has a golden yellow colour, when evaporated on water, leaves a small portion of reddish yellow insipid resin, and a larger of yellowish extractive dissolved in the water.

Medical properties and uses.— Sarsaparilla is demulcent, and said to be diuretic. It was brought to Europe about the year 1530, and introduced as a medicine of great efficacy in the cure of lues venerea; but fell into disrepute and was little used, till it was again brought into esteem by Dr. William Hunter and Sir Wm. Fordyce, about the middle of the last century; not however as a remedy fitted to cure syphilis, but of much efficacy in rendering a mercurial course more certain, and after the use of mercury.¹ Experience, however, has not verified the encomiums bestowed on it; and the extensive observations of Mr. Pearson have fixed the degree of benefit which is to be expected from this root in syphilitic complaints. "The contagious matter, and the mineral specific, may," he observes, "jointly produce in certain habits of body a new series of symptoms, which, strictly speaking, are not venereal; which cannot be cured by mercury; and which are sometimes more to be dreaded than the simple and natural effects of the venereal virus. Some of the most formidable of these appearances may be removed by sarsaparilla, the venereal virus still remaining in the system; and, when the force of the poison has been completely subdued by mercury, the same vegetable is also capable of freeing the patient from what may be called the sequelæ of a mercurial course."² Sarsaparilla is also recommended in scrofula, elephantiasis, or cutaneous affections resembling it, and chronic rheumatism; but its efficacy is doubtful. The dose of the powdered root is from ʒj. to ʒj. given three or four times a day.

¹ *Medical Observations and Enquiries*, vol. i.

² The symptoms alluded to, are nocturnal pains in the limbs, painful enlargements of the knee and elbow joints, membranous nodes, and cutaneous ulcerations, arising after a full course of mercury.

³ *Pearson on Remedies for Lues Venerea*, 24.

Official preparations. *Decoctum Sarsaparillæ*. L. E. D. *Decoctum Sarsaparillæ compositum*. D. *Extractum Sarsaparillæ*. L.

SODÆ MURIAS. Lond. MURIAS SODÆ. Edin. SAL COMMUNE. *Murias Sodæ*. Dub. Muriate of Soda. Common Salt. *Syn.* Muriate de Soude (F.) Salzaures Natrum (G.) Sal commune (I.) Sal (S.) *Méih* (Arab.) *Poppoo* (Tam.) *Loon* (H.)

This salt is one of the most abundant productions of nature, being found in almost every country of every quarter of the globe; either existing in mineral springs¹ or lakes²; spread in strata under the surface of the ground³; or rising from it into mountains⁴; and to its presence also the ocean owes its saltiness.⁵ In all these situations, however, it is generally mixed with earths and other matters, and therefore must undergo several processes to bring it to the degree of purity in which it occurs as an article of commerce.

In Cheshire, where the greater part of the salt used in this country is made, the brine is pumped up from very deep wells, and evaporated in wrought iron pans, which are generally about twenty or thirty feet long and broad, and nine or twelve inches deep; strongly set upon masonry over a large furnace, from which flues proceed under every part of the pan. They are protected from the weather by light pyramidal roofs of boards, sufficiently open, however, to admit of the escape of the steam from the boiling brine. When the brine attains the temperature of 100° Fahrenheit, it grows turbid, and carbonate of lime and of iron are deposited. These are partly taken off by skimming; but much of the mass falls to the bottom, and cannot be removed until the first deposition of crystallized salt gives it a sufficient body to enable the workmen to rake it out. After this is carefully done, the evaporation is continued at a boiling heat, when the salt gradually forms, and falls to the bottom of the pan in beautifully white delicate crystals, which are fished out, as they collect, with wooden vessels,

¹ The salt spring of Luneburg yields 75,600 gallons of brine in twenty-four hours, of which one-fourth is saline matter, making the annual produce 55,000,000 lbs. of salt. *Kirwan's Geo. Essays*, 392.

² These lakes are generally dry in the summer, being formed by the small streams from the hills settling in the valleys, and dissolving the salt of the soil. There is a lake or valley of this description eighteen miles from Aleppo, called in Arabic *Subkhet al Jibool*, or Valley of Salt; in which the salt is found, in the summer, crystallized from half an inch to two inches thick. *Russell's Aleppo*, 2d edit. i. 55.

³ The stratum of rock-salt in Cheshire is 50 feet thick. The salt mine of Wiliska, near Cracow in Poland, is 6691 feet long, 1115 feet broad, and 743 feet deep. *Coxe's Travels*, i. 197.

⁴ Near Cordova in Spain is a mountain of common salt 500 feet high, and nearly three miles in circumference.

⁵ The average quantity of salt contained in sea water varies in different latitudes. Between 10° and 20° south, it amounts to rather more than one twenty-fourth; between 18° and 34° north, it is rather less than one twenty-fourth; and at the equator it is nearly one twenty-fifth. *Thomson's Chemistry*, 4th ed. vol. iv. 141.

and poured into large wooden hollow cones, having a hole at the apex, which is undermost. When the salt has sufficiently drained, the cones filled with it are taken to a large room, heated by stoves, where they remain until thoroughly dry.¹ In warm climates the sea water is evaporated in shallow ponds by the heat of the sun; and in this mode what is denominated bay salt is made; but in colder countries the evaporation is carried on by artificial heat in a way similar to the Cheshire process. The crystals of the salt procured by these means are more perfect, and purer, the more slowly the evaporation is conducted.

The common salt of commerce, however, still contains small portions of muriate of magnesia, muriate of lime, and sulphate of lime. To separate these, dissolve the salt in four times its weight of pure water, and drop into the filtered solution, first muriate of barytes, and then carbonate of soda, as long as any precipitate falls. Filter and evaporate the clear fluid slowly till the salt crystallizes, which is pure muriate of soda.²

Qualities.—Pure muriate of soda is inodorous; its taste is strictly salt, and when pure, it is perfectly devoid of any degree of bitterness. It is in regular cubes, which are not affected by exposure to the atmosphere. When it deliquesces, it contains muriate of magnesia. Its crystals decrepitate when heated; and in a red heat melt, losing about two per cent. of their weight; and in a still greater heat the salt is volatilized undecomposed in white fumes. Its specific gravity is 2.126. It is equally soluble in cold and in hot water, rather more than two and a half parts of either being required to dissolve one of salt. It consists, according to Berzelius, of 46.55 of acid, and 53.44 of soda in 100 parts.³ It is decomposed by sulphuric acid and nitric acid.

Medical properties and uses.—This salt is tonic and antheimintic in moderate doses; purgative in larger; and externally stimulant. In the ordinary mode of using it, the tonic power of salt operates in assisting the process of digestion; and consequently, taken more freely, it proves useful in dyspepsia, and in correcting the weakened state of intestines, which favours the propagation of worms. In large doses it is said to check vomiting of blood, and may be used as a purgative; although it is seldom employed.⁴ As a local stimulant, its solution in tepid water, in the proportion of ʒiſs or ʒj to Oj of water, forms the common domestic enema. It is used also as a fomentation

¹ Aikin's Dictionary of Chemistry.

² Thomson's Chemistry, 4th ed. ii. 377.

³ Other chemists have obtained different results. Berard procured from 100 parts of acid 43.57. Dr. Marcet 46.54.

⁴ The purgative property of sea water does not altogether depend on this salt, as it contains a large proportion of muriate of magnesia, which is purgative.

to sprains and bruises; and, dissolved in a large proportion of water, forms the best stimulant general bath, whether used cold, or in a tepid, or in a hot state. To answer the first intentions, the dose of muriate of soda may be from grs. x. to ʒj; but to operate by stool from ʒis to ʒj is necessary. It should be largely diluted.

Official preparation. *Murias Sodæ siccatum.* E. D.

SO'DÆ SUB-BORAS. Lond. BORAS SODÆ. Edin.

BORAX. *Sub-boras Sodæ.* Dub. Subborate of Soda.¹

Syn. Borate alcalinule de Soude (F.) Borax (G.) Borace (I.) Borrax (S.) Boorne (Arab.)
Tancāna (San.) Sohaga (H.)

This is the purified state of a natural salt found in Persia and Thibet. In the latter country it is formed in the bed of a lake situated among the mountains, fifteen days' journey from Tisoolumba, which is twenty miles in circumference, and supplied only by springs from the bottom.² The borax is dug in large masses from the edges and shallows of the lake; yet the quantity is not diminished, the cavities being gradually filled by a fresh deposition of the salt. In this state it is named *tincal*, and is brought home packed in chests, in masses of adhering crystals, of a grey yellowish, or greenish white colour, intermixed with sand and other impurities, and covered with a greasy artificial production to prevent it from efflorescing. The purification of *tincal* was first discovered by the Venetians; and afterwards long carried on by the Dutch, who kept the process secret. It is now practised in England; and although the method has not yet been made public, yet Pelletier has ascertained, that by destroying the unctuous matter by calcination, the salt may be obtained pure by solution and crystallization.³

Qualities. — Purified sub-borate of soda is inodorous, and has a styptic, cool, alkaliescent taste. It is of a white colour, and usually in irregular crystalline masses, approaching to the form of hexangular prisms, terminated by triangular pyramids. It effloresces slowly and very slightly in the air; dissolves in twelve times its weight of water at 60° of Fah., and in six times its weight of boiling water, the solution changing the vegetable blues to green. In a moderate heat it undergoes the watery infusion, loses four-tenths of its weight, and becomes a dry, white, spongy mass, without undergoing any decomposition. According to Bergman, 100 parts consist of 34 acid, 17 soda, and 49 water; the acid, however, is not sufficient to saturate the alkali, and consequently the salt is

¹ The term *borax* is a corruption of the Arabic word *buruk*, which signifies *brilliant*. Vide Asiatic Researches, 8vo. vol. iii. p. 255.

² Saunders, *Phil. Trans.* vol. lxxix. 97.

³ *Mémoires de Chimie*, vol. i. 82.

a sub-borate. It is decomposed by the majority of the acids; by potash, and the sulphates, muriates, phosphates, and fluates of the earths, and of ammonia.

Medical properties and uses.—This salt is refrigerant and detergent. It is not given internally; and its chief employment is in aphthous affections of the mouth, and excessive salivation. It is applied either in the form of powder mixed with sugar, or dissolved in water, and united with honey as a lotion.

Official preparation. *Mel Boracis.* L. E.

SO'DÆ SULPHAS. Lond. Edin. Sulphate of Soda.

Syn. Sulphate de Soude (F.) Krystallisirtes Schwefelsaures Natrum, Glaubersalz (G.)

Sale Mirabile di Glaubero (I.) C'hara Nûn (H.)

This salt is found native in combination with oxide of iron, and muriate and carbonate of soda, sometimes effloresced on the surface of the soil in the neighbourhood of salt lakes, as in Hungary; and very often forming part of the contents of mineral saline springs, as those of Cheltenham and of Carlsbad. But the greater part of it used in this country is artificially prepared, and chiefly in the large way, during the manufacture of sal ammoniac from sulphate of ammonia and common salt. On this account the London College has inserted it in the list of materia medica; but as a formula is also given for its preparation, we shall defer the consideration of its qualities and uses till it comes under our notice among the Preparations.

SO'DA IMPURA. *Carbonas Sodæ impura.* Lond. SUB-CARBONAS SO'DÆ IMPURUS. Barilla. Edin. BARILLA. *Soda impura.* Dub. Impure Soda. Carbonate of Soda. Barilla.¹

Syn. Soude (F.) Kohlensaures Natrum (G.) Soda (I.) Barilla (S.) Seiji-mitti (H.) Sorjica (San.)

Carbonate of soda is found native in Hungary, Syria, Egypt, and India, on the surface of the earth, and on the margins of some lakes which become dry in summer. A large quantity is annually collected from the natron lakes of Egypt, situated in the valley Bahr-bela-ma, near the Delta. It is named *trona* by the natives; but very little of it finds its way to Europe: and the greater part of that which is employed, in this country at least, is of vegetable origin, being prepared from the ashes of some species of *Algæ*; but more abundantly from those of the *Salsola soda*, a plant which is cultivated on the shores of the Mediterranean by the Spaniards expressly for the purpose of yielding this salt. This plant is cultivated in salt marshes, chiefly in the vicinity of Alicant; and near Carthagera two hundred thousand quintals of barilla are gathered annually.

¹ *Notæ* of the ancients. It is remarkable that both the London and Dublin Colleges have fallen into the same error in naming this salt *impure soda*; the composition of the salt being well ascertained.

In September, when the seed is ripe, it is pulled up by the roots: after which it is dried, and in October is burnt in simple furnaces, the heat of which is just sufficient to cause the ashes to enter into a state of semifusion, and concrete into compact cellular masses, which form the *barilla* of commerce. That which is obtained in this country by burning the sea-wrack (chiefly the *Fucus vesiculosus* and *serratus*) is denominated *kelp*; and is the worst description of this salt.¹ Sardinia also furnishes some *barilla*, but inferior in quality to the Spanish. In Sicily *barilla* is procured at *Catania*, *Trapani*, *Marsala*, *Terranora*, and *Girgenti*. Orkney furnishes annually about three thousand tons of *kelp*.²

Vauquelin has proved that the salt exists ready formed in *Salsola soda*, and is only set free by the burning of the plant.³ He obtained from 500 parts of the plant 100 parts of ashes, besides oil, ammonia, and prussic acid. Five hundred grains of the ashes afforded 113 of muriate of soda, 68 dry subcarbonate of soda, 204 insoluble subcarbonate of magnesia, 100 of sand and oxide of iron, and 23 of water⁴; an analysis which may be regarded as exhibiting the general components of *barilla*.

There are several varieties of *barilla* brought from Spain; that which is known by the name of *sweet barilla* is the most esteemed.

Qualities.—Good *barilla* is in hard, dry, spongy, sonorous masses of a greyish blue colour, and becoming covered over with a saline efflorescence when exposed to the air. It should not emit any unpleasant odour on solution; and when applied to the tongue should impress a sharp alkaline taste.

Use.—Impure subcarbonate of soda is employed only for yielding the pure subcarbonate.⁵

Official preparation. *Sodæ Subcarbonas.* L. E. D.

¹ The inhabitants of the Canary Isles extract carbonate of soda from the ashes of the *Mesembryanthemum crystallinum*, or ice plant, which yield one-third of their weight of the salt. *Phil. Mag.* vi. 187.

² The sea-wrack is cut from the rocks in April and May chiefly, dried in the air, and then burnt in a kiln, in which they are stirred with an iron rake into a fluid state; on cooling, the ashes condense into a dark blue or whitish mass, very hard and solid. The plants about three years old, yield the largest quantity of *kelp*. The best *kelp* has an acrid, caustic taste, a sulphurous odour; is compact, and of a dark blue greenish colour. It yields about one-twentieth part of its weight of soda.

³ *Annales de Chimie*, xiii. 65.

⁴ *Annales de Chimie*, xviii. 76.

⁵ A tolerably pure subcarbonate of soda is obtained in France from sea salt, and muriate of soda. To a solution of one part of salt, three parts of finely pulverized litharge is added, and rather more than half a part of chalk. These are agitated well together, and then set apart; a double decomposition gradually takes place, muriate of lead and muriate of lime are formed, while the soda, uniting with the carbonic acid set free from the chalk, crystallizes, and is easily separated.

In Britain it is obtained in considerable quantity by decomposing sulphate of soda, either by means of subcarbonate of potash, or acetate of lime, or litharge; or by de-

SOLANUM. *Spec. Plant. Willd. i. 1025.*

Cl. 5. Ord. 1. Pentandria Monogynia. Nat. ord. Luridæ Linn.
Solaneæ Juss.

G. 383. Corolla wheel-shaped. Anthers slightly coalescing, opening by two pores at the apex. Berry two-celled.

* unarmed.

Species 15. *S. Dulcamara*. Woody Nightshade, or Bitter-Sweet.
Med. Bot. 2d ed. 240. t. 85. Smith Flora Brit. 256. Eng. Bot. 565.

Official. DULCAMARÆ CAULES. *Lond.* SOLANI DULCAMARÆ CAULES. *Edin.* DULCAMARA; STIPITES AUTUMNO COLLECTI. *Dub.* The Stalks of Bitter-Sweet.

Syn. Douce-amere (F.) Bittersusstangel (G.) Dulcamara (I.)

This species of Solanum is an indigenous shrub, growing in hedges and shaded spots; and flowering in June and July. The root is ligneous: the stem woody, roundish, branched, and climbing sometimes to the height of six or eight feet: the leaves are alternate, on footstalks, entire, smooth, soft, about two inches long and one broad, and of a dull green colour; the lowermost cordate and undivided, and the uppermost halberd-shaped: the flowers are in elegant clusters opposite to the leaves, or terminal, drooping, and having the semblance, but not the structure, of a true cyme; each consisting of a small purplish calyx with blunt segments: a corolla of five reflected, equally divided, pointed, bright violet-coloured segments, with two green dots at the base, and a longitudinal deeper purple vein through the centre of each segment; and large, erect, almost sessile, lemon-yellow anthers: the berries, which ripen in September and October, are oval, scarlet, very juicy, bitter, and poisonous.¹

The extreme twigs are the parts employed. They should be gathered in autumn, as at that season they are more powerful; depending perhaps on their being less succulent, and containing more of the peculiar secretion on which the virtues of the plant depend.

Qualities. — Both the fresh and dried twigs are inodorous. They have a slightly bitter taste, followed by a sweetness not unlike that of liquorice root, with a slight degree of acrimony. Boiling water extracts all their active matter; but their virtues are destroyed by much coction. Scheele found that they contain citric acid.

Medical properties and uses. — Bitter-sweet is diuretic and

composing the sulphuric acid of the sulphate by charcoal. The latter method is practised in the West of Scotland, and affords a very pure subcarbonate of soda. "About 500 cwt. of sulphate of soda and 100 cwt. of charcoal are ground together, and the mixture exposed in a reverberatory furnace until it becomes pasty. It is then transferred into large casks, and lixiviated. The ley is afterwards evaporated and crystallized." *Duncan's New Edinburgh Dispensatory*, 216.

¹ They excite violent vomiting and purging.

narcotic. It has been found useful in humoral asthma, dropsy, chronic rheumatism, and in lepra vulgaris and alphos, scabies, and pityriasis. Willan² remarks, that it is not applicable for the cure of lepra nigricans: we can assert that it is not of the least use in acute rheumatism; and we believe of as little in fluor albus and suppression of the menses, in which it has been strongly recommended. When given in too large doses at first, it occasions nausea, vomiting, syncope, and violent palpitation. It therefore requires to be begun with small doses; and even when it is more cautiously administered, if these symptoms occur, the dose must be lessened, and some aromatic conjoined. The usual form under which it is used is that of watery infusion or decoction; but it may be also given in substance pulverized. The dose of the powder may be from grs. x. to 3j taken in a cupful of milk.

Official preparation. *Decoctum Dulcamaræ*. L.

SOLIDAGO. *Spec. Plant. Willd.* iii. 2053.

Cl. 19. Ord. 2. Syngenesia Superflua. *Nat. ord. Compositæ Discoidææ* Linn. *Corymbiferae* Juss.

G. 1292. Receptacle naked. Pappus simple. Corolllets of the ray about five. Calyx scales imbricate, closed.

**** with erect racemes.

Species 35. *S. Virgaurea*. Common Golden Rod. *Smith Flora Brit.* iii. 890. *Eng. Bot. t.* 301.

Official. VIRGA AUREA; FLORES, FOLIA. *Dub.* Flowers and leaves of Common Golden Rod.

This is an indigenous perennial plant, found in woods, copses, and among furze upon heathy ground; flowering from July to September. The leaf consists of long simple fibres: the stem, which varies in height, from ten inches to three feet, is curved below, then erect, leafy, very slightly zigzag, angular, striated, rough, and a little downy: the leaves are deep green on the upper surface, and pale beneath, on winged petioles, harsh, and clothed with rigid down: the radical leaves are obovate and serrated; the stem leaves narrower, more entire, and alternate: the flowers are yellow, in terminal and axillary erect clusters, forming a dense panicle, with lanceolate, downy bractes: the scales of the calyx are membranous, with a downy border: the rays of the corolla from five to nine or ten, oblong, elliptical, and toothed at the apex: the seeds are pubescent, and the pappus rough.

Qualities.—The odour is slightly aromatic, and the taste subastringent and somewhat aromatic. Boiling water extracts the active matter of the leaves: the infusion changes slightly to green syrup of violets, and precipitates sulphate of iron black.

¹ Description and Treatment of Cutaneous Diseases, 147.

Medical properties and uses. — Golden rod is astringent, and has been regarded as lithontriptic. It may be of some use in a weak state of the viscera; and hence, like other tonics, may prove beneficial in calculous habits; but its effects are not sufficient to entitle it to much notice. The dose of the powdered leaves and flowers may be from grs. x. to ʒj or more.

SPARTIUM.¹ *Spec. Plant. Willd.* iii. 926.

Cl. 17. Ord. 4. Diadelphia Decandria. *Nat. ord.* Papilionaceæ.

G. 1832. *Stigma* longitudinal, villous above. *Filaments* adhering to the germen. *Calyx* produced downwards.

** with ternate leaves.

Species *S. scoparium*. Common Broom. *Med. Bot.* 2d ed. 413. t. 150.

Smith Flora Brit. iii. 753.

Official. SPARTII CACUMINA. *Lond.* SPARTII SCOPARII SUMMITATES. *Edin.* GENISTA; SEMINA; CACUMINA. *Dub.* The tops and seed of Broom.

¹ *Syn.* Genet à balais (*F.*) Pflimenkraut (*G.*) Ginestra (*I.*) Esparto (*S.*)

This is an indigenous shrub, growing on dry common pastures; flowering in May and June. It usually rises from four to six feet in height, and sends off numerous straight, angled, green, smooth, leafy branches: the leaves are ternate, small, and smooth; the upper ones, however, are frequently simple: the flowers are papilionaceous, axillary, solitary, peduncled, nodding, large, and showy; of a golden colour, sometimes tawny on the outside, and occasionally altogether of a lemon hue: the calyx is nearly bell-shaped, bilabiate, gaping, even, and purplish, with a five-toothed lip: the stamens are all united into a tube at the base, and bear oblong saffron-coloured anthers: the germen is villous: the style bent almost to a circle: and the legume compressed, brown, ciliated; and containing several compressed shining seeds.

Qualities. — The tops, when bruised, have a disagreeable odour, and a nauseous bitter taste. Both water and alcohol extract their active matter.

Medical properties and uses. — Broom tops are diuretic and cathartic; the seeds are said to be emetic. The effects of this plant have been very long known to the common people; and both Mead and Cullen found them useful in dropsy. The usual mode of exhibiting them is in the form of decoction, made by boiling ʒj of the green tops in a pint of water down to half a pint. Speaking of this decoction, of which two table spoonfuls were given every hour till it operated by stool, Cullen says²: "It seldom fails to operate both by stool and urine, and by repeated exhibition every day, or

¹ *Σταγίριον* Dioscoridis.

² *Mat. Med.* ii. 534.

every second day, some dropsies have been cured :” Sydenham used the ashes, which contain an alkaline salt.²

Official preparation. *Extractum Cacuminum Genestæ*. D.

SPIGELIA. *Spec. Plant. Willd.* i. 824.³

Cl. 5. *Ord.* 1. Pentandria Monogynia. *Nat. ord.* Stellatæ Linn. Gentianæ Juss.

G. 308. Corolla funnel-shaped. Capsules twin, two-celled, many-seeded.

Species 2. *S. marilandica*. Perennial Worm-grass. *Med. Bot.* 2d ed. 178. t. 69. *Edin. Phil. Trans.* iii. 151. t. 1.

Official. SPIGELIÆ RADIX. *Lond. Dub. Edin.* Worm-grass root.

Syn. Spigelia de Maryland (*F.*) Spigelia (*L.*)

This is a perennial plant, a native of the warmer parts of North America; flowering in July and August.⁴ The stems are annual, simple, erect, rough, quadrangular, and rigid; and about seven or eight inches in height: the leaves are opposite, sessile, ovate-lanceolate, quite entire, smooth, and spreading: the flowers are in a solitary spike, with small opposite bractes: the calyx consists of five awl-shaped, persistent leaflets: the corolla is of a bright red colour on the outside, and deep orange within, pentangular above, gibbous at the throat, widening at the base; with the border five parted; the segments being lanceolate and revolute: the stamens are five, shorter than the corolla, supporting sagitate, converging anthers: the germen is superior, with a round style, jointed below, with the upper part deciduous: the seeds are angular and rugged.

Qualities.—Spigelia root has a bitter taste, which is imparted to boiling water.

Medical properties and uses.—This root is purgative and anthelmintic. Its anthelmintic virtues were discovered by the Cherokee Indians, to whom it is known under the name of *unsteetla*; and many opportunities of proving its efficacy in worm cases have occurred both in America and this country. When in the recent state, and given in small doses, it occasionally produces giddiness, dimness of sight, and even convulsions; effects which are attributed to a narcotic principle it possesses, but which its powerful cathartic property prevents from acting, when the dose is large. It is usual to administer an emetic previous to the use of it; and to aid its purgative operation by the addition of two or three grains of calomel, or eight or ten of rhubarb. It has been found most powerful in expelling lumbrici; and its vinous infusion is said to have been found useful in intermittents. Dr. Barton recommends it in the protracted remitting fever of infants, which often lays the

¹ *Materia Medica*, ii. 534.

² *Tract. de Hydroke, Opera*, 466.

³ The genus was named after Adrian Spigelius, a celebrated professor of anatomy at Padua.

⁴ It was first cultivated in England in 1694, by Bobart.

foundation of hydrocephalus. Spigelia root may be administered either in substance or in the form of aqueous infusion. The dose of the pulverized root is from grs. x. to ʒj, given every night and morning until the worms are expelled.

SPIRITUS RECTIFICATUS. *Lond. ALCOHOL FORTIUS. Edin. SPIRITUS VINOSUS RECTIFICATUS. Dub. Rectified Spirit. Alcohol.*

Syn. Eau de Vie Rectifié (F.) Rectifizirter Weingeist (G.) Acquavite rettificata (I.)
Agua ardiente (S.)

This is alcohol nearly in the highest state of concentration in which it can be easily prepared in the large way for the purposes of trade. The London and Edinburgh Colleges state its specific gravity to be to that of water as 835 to 1000; while the Dublin College states it at 840. The Edinburgh College names this spirit *alcohol*; but as directions are given both by the London and the Dublin Colleges for the preparation of a still stronger spirit, the name of *alcohol*, in their pharmacopœias, is judiciously retained for the stronger spirit, while that of *rectified spirit* is applied to the present preparation.

All substances which have undergone the vinous fermentation, and in which it is not completely over, contain alcohol ready formed, but combined with colouring matter, extractive, and other principles, and are capable of affording it by distillation. The first distillation of wines and fermented liquors afford ardent spirits, such as brandy, rum, arrack, whisky and gin.[†] These are all mixtures of alcohol, water, and a little oil or resin, which give them their characteristic flavour and colour, and the quantity and nature of which constitute the sole differences in ardent spirits. It is from the re-distillation or rectification of these that rectified spirit is produced.

The process of rectification is exceedingly simple. Any quantity of brandy, malt spirits, or rum, is diluted with an equal portion of water, and put into an alembic or still, to which a refrigeratory is united, and distilled with a very gentle heat. The first product is the strongest and purest, and, when it has come over to the amount of one-fourth of the whole contents of the still, forms the rectified spirit. If the distillation be continued, the spirit continues to come over colourless, but weaker and weaker, till at length it is so watery as not to be inflammable. What remains in the alembic is water, the colouring ingredients, and any accidental impurities. When the ardent spirits, which have been employed, contained much oil, the distillation requires to be repeated, and generally with

[†] We have no historical record of the period when the distillation of spirit was invented: the Greeks and Romans were ignorant of ardent spirits; but it is certain that spirits were very early known to the northern nations.

the addition of alkali, lime, or other articles, before the empyreumatic flavour can be completely destroyed. When alkali is used, the spirit has an urinous taste; to free it from which it is again distilled with the addition of a little alum and charcoal, the acid of the former of which attracts the small portion of alkali which the spirit held in solution. Malt spirits, when properly rectified, yield as pure and as strong rectified spirit as brandy.

The strength of spirits is ascertained in common by several methods. The taste, and the degree of frothiness or size of the bubbles formed when spirit is shaken, is the least correct method; and the burning the spirit, and observing the quantity of water which remains after the combustion, although more accurate, is liable also to error, from the impossibility of performing the experiment always under the same circumstances. Pure alcohol¹ leaves no water; rectified spirit of moderate strength, 25 per cent.; French brandy, 56; and common malt liquor, 65; and the like. Another test is the pouring a few drops of the spirit on gunpowder; but this is also very incorrect, and indicates two degrees of strength only; that which fires gunpowder, and that which cannot fire it. A more accurate test than any of these, and sufficient for common purposes, is to shake the spirit in a phial with very dry pure sub-carbonate of potash, and observe the quantity of water attracted by the alkali, which indicates its strength. But the only certain mode of ascertaining the relative strength of spirits is by determining the specific gravity of the spirit, at a given temperature. Thus at 60° Fahrenheit the specific gravity of rectified spirit is .83599, at 65° it is .83362, and at 70° the gravity of the same spirit is .83124; while the gravity of the proof spirit of the London College at the same degrees of temperature is .93002, .92794, and .92580; (see Table under the article *Alcohol* among the Preparations;) the weakest spirit having the greatest specific gravity, and this diminishing as the temperature increases. The usual mode of ascertaining the relative gravity of different spirits is by the hydrometer², of which there are different kinds in use. For ordinary purposes, the relative strength of spirits may be known by weighing the sample to be tried in a phial capable of holding exactly 500 grains of distilled water. An equal bulk of rectified spirit weighs 418 grains, and of proof spirit 465; hence the number of grains above or below these sums will indicate the relative strength of the spirit.

¹ By the term *pure alcohol* is meant alcohol of a specific gravity of 796 at 60° Fahrenheit, the strongest which can be procured.

² For a description of this instrument see Part I.

Qualities. — Pure rectified spirit has a fragrant odour, and a hot, highly pungent taste. It is colourless; always fluid; cannot be congealed at any known degree of cold; evaporates speedily at the ordinary temperature of the atmosphere; boils at 163° Fahrenheit; and is extremely inflammable, burning with a blue lambent flame, without any sensible smoke. Like alcohol it combines with water in every proportion; and, on account of its affinity for water, precipitates many of the neutral salts from their aqueous solutions. It is capable of dissolving many saline bodies, and is the proper solvent of the greater number of the proximate principles of vegetables. Its constituents are 85 of pure alcohol and 15 of water, in 100 parts, when its specific gravity is 835 at a temperature of 60° of Fahrenheit; but 83 only of pure alcohol, and 17 of water, when it is 840 as designated by the Dublin College.

Medical properties and uses. — Rectified spirit is a very powerful stimulant. In its undiluted state it is never exhibited as a remedy; and is employed only for forming the diluted spirit, and as a pharmaceutical agent.

Official preparations. *Alcohol.* L. D. *Spiritus Camphoræ.* L. E. *Spiritus Ammoniæ.* L. D. *Spiritus Lavandulæ.* L. E. D. *Tinctura Alces.* L. *Tinctura Asafetidæ.* L. E. D. *Tinctura Benzoini composita.* L. E. D. *Tinctura Castorei.* L. E. D. *Tinctura Guaiaci.* L. E. D. *Tinctura Moschi.* D. *Tinctura Ferri Muriatis.* L. *Tinctura Muriatis Ferri cum Oxydo rubro.* D. *Liquor Hydrargyri Oxymuriatis.* L.

SPIRITUS TENUIOR. *Lond.* ALCOHOL DILUTUS. *Edin.* SPIRITUS VINOSUS TENUIOR. *Dub.* Weaker Spirit. Diluted Alcohol. Proof Spirit.

This is merely rectified spirit diluted with a certain proportion of water. According to the London and Dublin Colleges, its specific gravity should be to that of distilled water as 930 to 1000; while the Edinburgh College orders it of the gravity of 935. The former may be formed by mixing four parts by measure of rectified spirit with three of water, and contains 44 parts of pure alcohol and 56 of water in 100 parts; the latter is obtained from equal parts of rectified spirit and water, and contains 42 of pure alcohol and 58 of water in 100 parts. But very frequently, instead of being formed by mixing the pure rectified spirit with water, an impure spirit of a strength nearly similar is employed. The qualities of the diluted spirit are not different from those of the rectified spirit, except in degree, and in some instances it is better fitted for taking up the principles of vegetables submitted to its action.

Medical properties and uses. — Alcohol diluted to the degree of proof spirit is still a very powerful diffusible stimulant, and

too strong for internal use. Externally applied, it is recommended in burns; to restrain bleeding in passive hæmorrhages; and as a friction or fomentation to relieve muscular pains; and in a more diluted state it forms a good collyrium in the latter stage of ophthalmia. Proof spirit diluted with water is employed as a remedy in the form of tinctures and spirits; and the ardent spirits in common use may be regarded as nearly of the same nature. These taken in moderation increase the general excitement, communicate additional energy to the muscular fibres, strengthen the stomach, and exhilarate the mind. Hence they are often and advantageously used in cases of debility and the low stage of typhoid fevers, in which the use of wine is indicated; and in habits disposed to create acidity they are even preferable to wine; some of them, particularly brandy, proving gratefully stomachic, when wine is nauseated and rejected. As an article, however, of daily or dietetical use, particularly if taken in immoderate doses or long continued, ardent spirits, besides being the source of much moral evil, and debasing the human character nearly to a level with that of brutes, occasion disease, and are commonly the origin of dyspepsia, hypochondriasis, and hepatic and visceral obstructions. The hurtful effects of ardent spirits, however, are obviated in a considerable degree, by diluting them with water, and adding lemon-juice and sugar to the mixture, so as to form what is generally known by the name of punch. Although all the varieties of ardent spirits may be regarded as diluted alcohol, yet each has a peculiarity of operation: thus brandy is simply cordial and stomachic; rum heating and sudorific; gin and whisky diuretic; and arrack styptic, heating, and narcotic, and ill adapted to European constitutions.

Official preparations. *All the tinctures except those which are prepared with rectified spirit; and all the spirits.*

SPONGIA. *Syst. Nat. Gmelin. vi. 3817.*

Cl. 6. Ord. 4. Vermes Zoophyta.

G. 343. A flexile, fixed, torpid, polymorphous animal, composed either of reticulate fibres, or masses of small spires interwoven together, and clothed with a gelatinous flesh full of small mouths on its surface, by which it absorbs and ejects water.

Sp. 8. S. *officinalis*. Official Sponge. *Phil. Trans. lv. 288. t. 10.*

Official. SPONGIA. *Lond. Dub.* SPONGIA OFFICINALIS. *Edin.*

Sponge.

Syn. *Eponge (F.) Meerschwamm (G.) Spagna (I.) Esponja (S.) Isfunge (Arab.) Mo-ahādul (H.)*

This species of sponge is found chiefly in the Mediterranean and Red Seas. In some of the islands of the Archipelago, the inhabitants are trained from infancy to dive for sponges, which are generally found attached to the bottom of the rocks. Al-

though the ancients had perceived something like sensation in sponges by their shrinking, they were long supposed to be of a vegetable nature, from their texture and the branched appearance which they assume, till Mr. Ellis's observations¹ first established the fact that they are animals *sui generis*, the mouths of which are the open ends of so many branched tubes opening on the surface, through which they receive their nourishment and discharge their *fæces* like polypes. These mouths are generally guarded with minute spines or points, and the tubes are filled with a gelatinous matter, and often with minute shells and sand.

Qualities — Sponge cleaned and rendered fit for use is of a brownish yellow colour, soft, light, and very porous; absorbing rapidly by capillary attraction as much as it can contain of any fluid in which it is immersed, and again yielding it up on being compressed. When sponge is digested with boiling distilled water it yields up to it a considerable proportion of gelatin, and the sponge loses much of its flexibility, and crumbles between the fingers when dry. Boiled with potash it forms a soap. Its principal constituents, according to the analysis of Mr. Hatchett, are animal gelatin, albumen, a small portion of common salt, and some carbonate of lime.

Medical properties and uses. — Sponge, in its usual form, is never employed as a remedy; but is an exceedingly useful instrument in the practice of surgery.

Official preparations. *Spongia usta*. L. D.

STALAGMITIS. *Spec. Plant. Willd.* iv. 980.

Cl. 23. *Ord.* 1. Polygamia Monoecia. *Nat. ord.* Tricoccæ.

G. 1888. *Hermaph.* Calyx four-leaved. Corolla four-petalled. Stamens thirty, inserted into a fleshy four-angled receptacle. Style thick. Stigma four-lobed. Berry one-celled, crowned by the style, three-seeded.

Male. Calyx, Corolla, and Stamens hermaphrodite.

Sp. 1. *S. Cambogioides*. The Gamboge-tree. *Murray App. Med.* iv. 655.

Official. CAMBOGIA. *Lond.* GAMBOGIA. *Edin.* GAMBOGIA; GUMMI RESINA. *Dub.* Gamboge.

Syn. Gomme Gutte (*F.*) Gummigutt (*G.*) Gomma Gotta (*I.*) Ossîra réwûnd (*Arab.*) Gahketu (*Cingalese.*)

The tree yielding this gum-resin is a native of the kingdom of Siam, and of Ceylon, where it is known by the names *Ghokata*, or *Gohkata*, or *Gohlatha*. It is of middling stature, and moderately branching. The leaves are on short petioles, ovate, opposite, entire, even, coriaceous, rigid, and of an obscure green colour. The male flowers are either in distinct clusters, or mixed with the hermaphrodite, which are axillary. The calyx consists of four ovate leaflets, the two exterior of

¹ *Phil. Trans.* lv. 284.

which are smaller than the two interior: the petals are four, spreading, coriaceous, with ciliated margins, and of a yellow colour: the stamens are about thirty, affixed to a quadrangular fleshy receptacle, and bearing subquadrangular, club-shaped anthers; sometimes there is the rudiment of a style, and an echinated, unequal, sterile stigma. The *hermaphrodite* flowers are in axillary whorls, or on the joints of the smaller branches, sometimes mixed with the male flowers, sometimes in opposite gems. The calyx, corolla, and stamens are the same in both: the germen is globular, with a short solitary style, and a three or four-lobed stigma; with the lobes spreading, obcordate, and persistent. The fruit is a smooth globular whitish or rosaceous berry, crowned by the lobes and style of the stigma, and containing several long, triangular seeds.

In Siam the gamboge is obtained in drops by breaking the leaves and young shoots, but in Ceylon from the bark of the tree wounded with a sharp stone. It is collected first in coconut shells, and thence transferred into large earthen jars, where it remains until it is nearly dried to a cake, when it is formed into rolls and wrapped up in leaves.¹ It is brought to Europe packed in cases and boxes. It was first brought to Europe by the Dutch, about the middle of the seventeenth century.

Qualities. — Gamboge is inodorous, and nearly insipid; opaque, brittle, breaks with a vitreous fracture, and is of an orange-yellow colour. Its gravity is 1.221.² When heated it melts, and by increasing the heat burns with a white flame, and leaves a very light spongy charcoal. When wetted, it stains the fingers a brilliant yellow; and when triturated with water about two-thirds are dissolved, and a turbid yellow solution produced. Alcohol dissolves nine parts in ten, sulphuric ether six parts; and both form transparent deep golden yellow tinctures. Gamboge is also soluble in a strong solution of pure ammonia, and potash, forming deep orange-red solutions.

The watery solution of gamboge reddens tincture of litmus; is not precipitated by alcohol, but, on the contrary, is rendered transparent by it; oxysulphate of iron strikes with it a pale olive-brown hue, but is not precipitated, nor is it affected by solutions of any of the other metallic salts. The alcoholic tincture is rendered turbid and bright yellow by the addition

¹ The *Cambogia gutta* of Linnæus, several species of *Hypericum*, *Chelidonium lacinatum*, and several other plants, yield a yellow juice; but that the tree we have described affords the true gamboge, was clearly established by Kœnig, who resided many years at Tranquebar.

² Brisson.

of water, but the precipitate is long of being deposited. The ethereal tincture, when evaporated on water, leaves a pellicle of beautiful orange-coloured brittle resin, which imparts no colour to water. When water is added to the alkaline solutions they are not even rendered turbid; but, on the addition of acids, yellow precipitates are produced which are soluble in an excess of acid. These experiments confirm the analysis of Braconnet, from which he concluded that gamboge contains one part of a gum resembling cherry-tree gum, and four of a brittle resin; but they do not throw any light on the nature of its cathartic property.

Medical properties and uses.—Gamboge is a powerful drastic cathartic; and frequently excites vomiting, even in moderate doses. It is efficaciously used in obstinate costiveness, in dropsies, and for the expulsion of tæniæ; but, from the violence of its operation, and the griping it occasions, it requires to be exhibited with caution. As a hydragogue it is usually combined with squill and supertartrate of potash; and for cathartic purposes, with calomel, soap, or rhubarb. The alkaline solution of it has also been administered in dropsy, in which form it is said to operate both by stool and urine.

The dose of the alkaline solution is from m xxx ml in a cupful of water twice a day. It is, however, more usually given in substance, in the form of pills, in doses of from grs. ij. to grs. vj. variously combined.

Official preparations. *Pilulæ Cambogiæ compositiæ.* L. E.

STANNUM.* PLUMBUM ALBUM. Κασσιτερον. Tin.

Syn. Estain (F.) Zinn (G.) Stagno (I.) Estano (S.) Resass (Arab.) Ranga (H.) Tāgarum (Tam.)

This metal is not very diffusely spread over the surface of the globe; but is very abundant in the places where it occurs. It is plentifully procured in Cornwall[†]; and mines of it are also wrought in the Erzgebirge, on the borders of Bohemia; in the province of Galicia, in Spain; and in the peninsula of Malacca, in Asia. It is said also to have been found in Chili.

It occurs

A. In its metallic state:

I. United with Sulphur and copper.

Sp. 1. *Tin pyrites.*

B. Oxidized:

II. Combined with oxide of iron and silice.

2. *Tin stone.*

3. *Wood tin.*

* Beckman is of opinion that the *Stannum* of the ancients was neither our tin nor a peculiar metal; but the regulus of lead, or *werk* of the Germans, as procured by the first smelting of the ore, which always contains silver. *Hist. of Inventions*, vol. iv. p. 7.

† It is uncertain when the Cornwall mines were first wrought. The Phœnicians came to Britain for tin; and there is a tradition in Cornwall, that the very old forsaken works were those of the Jews, and are therefore called *Altal sarazin*. The Jews' cast off works. *Norden's Description of Cornwall*, 4to. 1728, 41.

The purest and best tin of Cornwall is procured from the tin stone, which is found beneath the beds of streams, particularly at Carn near Perran. The ore is found under a stratum of clay about fifty feet thick, and a layer of rounded stones; occurring loose in lumps and grains of various sizes. It is first washed, then bruised and passed through wire sieves containing 16 meshes in the square inch; and next smelted with charcoal, in a common blast furnace, through a hole in the bottom of which the reduced metallic tin flows into a pit below; to purify it, the tin in the fused state is ladled from the pit into an iron boiler placed over a fire; and pieces of charcoal plunged, by means of an iron instrument, to its bottom, which occasions an ebullition, and causes any slag it contains to rise to the surface, whence it is skimmed off. The tin is lastly cast into bars or pigs, weighing from 2 to 3 cwt. each.*

Qualities.—Tin has a very slight, somewhat disagreeable, taste, and emits a peculiar odour when rubbed. It has the colour and the brilliancy of silver; is very malleable; but has little ductility and tenacity; is easily cut with a knife; and is flexible, producing a peculiar crackling noise when bent backwards and forwards. Its specific gravity, after fusion, is 7.291; and after being hammered, 7.299.² It melts at 442 Fahr., but is not volatilized, and on cooling crystallizes in rhombs. Tin exposed to the air soon loses its lustre, and when melted it is oxidized, a gray oxide being formed on its surface, which becomes yellow if the heat be continued; and if raised to a full red heat takes fire, and acquires a pure white colour. It is also oxidized by many acids; and combines readily with sulphur.

Officinal. STANNUM: STANNI LIMATURA. *Lond. Edin. Dub.* The filings and powder of tin.

Tin melted and agitated briskly in a heated mortar with a warm pestle till it cools, or shaken in a wooden box, is reduced to a kind of powder, consisting of small rounded particles, with very little lustre; but still in the metallic state. This is the powder of the pharmacopœias.

Medical properties and uses.—Tin is anthelmintic. It was formerly used in hysteria and hypochondriasis; but its efficacy in these complaints cannot extend beyond its power of dislodging worms. It is generally supposed to operate mechanically only; but it has been suggested, that "it is not improbable, it may act by generating hydrogen gas in the intestinal canal, which proves noxious to the animal; and its efficacy has been said to be increased by combination with sulphur,

Aikin's Dictionary of Chemistry.

² Brisson.

by which sulphuretted hydrogen gas will be evolved." For the mode of exhibiting it, see *Pulvis Stanni* among the Preparations.

Official preparation. *Pulvis Stanni*. D.

STAPHISAGRIÆ SEMINA. Vide *Delphinium*.

STYRAX. *Spec. Plant. Willd.* ii. 623.

Cl. 10. Ord. 1. Decandria Monogynia. Nat. ord. Bicornes Linn. Guaiacinae Juss.

G. 874. Calyx inferior. Corolla funnel-shaped. Drupe two-seeded.

Sp. 1. *S. officinale*.¹ Official Storax. *Med. Bot.* 2d edit. 291. t. 101.

Sp. 3. *S. Benzoin*. Benjamin-tree. *Med. Bot.* 2d. ed. 294. t. 102.

Phil. Trans. lxxvii. 307.

1. STYRAX OFFICINALE.

Official. STYRACIS BALSAMUM. Lond. STYRACIS BENZOINI BALSAMUM. Edin. STYRAX CALAMITA; RESINA. Dub. Storax Balsam.

Syn. Storax (F.) Storax (G.) Storace (I.) Aznibar (S.)

The official storax-tree is a native of the south of Europe and the Levant; and flowers in July. It rises about fifteen feet in height, sends off many branches, and is covered with a rough gray bark. The leaves, which are about two inches long, an inch and a half broad, and of a bright green on the upper surface, and hoary on the under, are petiolate, alternate, elliptical, pointed, and entire. The flowers are in terminal clusters: the corolla is monopetalous, funnel-shaped, large, and of a white colour: the filaments are placed in a regular circle, and apparently adhere at the base, supporting erect oblong anthers; and the germ is oval with a slender style and simple stigma. The fruit is a juiceless drupe, of an ovate globular form, containing one or two compressed angular nuts.

From this tree storax is obtained in Asiatic Turkey. It issues from incisions made in the bark; and as it was formerly the custom to collect and export it in reeds, it was named *Styrax calamita*.² But only two kinds of storax are now found in the shops, storax in the tear, which is pure storax; and storax in the lump, or red storax, which is mixed with saw dust and other impurities. Both kinds are brought from the Levant in chests and boxes.

Qualities.—Storax has a fragrant odour, and a pleasant, subacidulous, slightly pungent, and aromatic taste. It is of a reddish brown colour, and brittle at the ordinary temperature of the air, breaking with a shining resinous fracture; but soon softens between the fingers, and melts at a low heat, exhaling

¹ Murray. *System of Materia Medica*, i. 490.

² *Erucæ* Dioscoridis.

³ The Dublin College retains this appellation, although no storax of this description is now to be met with in the shops.

a strong odour of benzoic acid. In a higher degree of heat it burns with a white flame, and leaves behind a light spongy charcoal. It is deprived of its red colour, and the little transparency it possesses by chewing; and becomes in a remarkable degree, more brittle. To water it imparts a yellow colour, and its odour and taste; but in distillation scarcely any oil is obtained. Alcohol and ether dissolve it completely, leaving only impurities, and the tincture is decomposed by the addition of water. Its constituents are resin, an empyreumatic oil, and benzoic acid.

Medical properties and uses.—Storax is stimulant, and in some degree expectorant. It was formerly much prescribed in asthma, catarrh, phthisis, and menstrual obstructions; but it is now scarcely ever employed, except as an adjunct on account of its fragrance; and, certainly, it cannot be recommended in the above complaints. The dose is from grs. x. to ʒss.

Official preparations. *Styrax purificata*. D. *Pilulæ e Styrace*. D.

2. STYRAX BENZOIN.¹

Official. BENZOINUM. *Lon.* STYRACIS OFFICINALIS; BALSAMUM. *Edin.* BENZOE; RESINA. *Dub.* Benzoin; a balsam.

Syn. Benzoin (F.) Benzoe (G.) Belzuino (I.) Benjui (S.) Lubán (H. and Arab.)

The benzoin or benjamin tree, is a native of Sumatra. It is a tall tree sending off many round branches, which are covered with a whitish downy bark. The leaves are alternate, on round, striated, tomentose petioles, oblong, quite entire, pointed, veined, smooth above, and tomentose beneath. The flowers are in compound axillary clusters, nearly as long as the leaves; with the common peduncle tomentose; the partial alternate, spreading, and tomentose: the pedicels short; and the flowers all hanging on the same side. The calyx is bell-shaped, short, and downy; the corolla consists of five linear obtuse petals, four times longer than the calyx, connected together at the base, and externally cineritious. The filaments are ten, a little shorter than the petals, connected at the base, and supporting linear erect anthers: the germen is superior, ovate, and downy, with a slender style and double stigma.

Benzoin is obtained from this tree by wounding the bark near the origin of the lower branches. The tree is never wounded under six years of age; and cannot sustain these annual incisions above twelve years. A tree yields about three pounds of balsam annually. It is brought to this country in large masses packed in chests and casks.

¹ Benzoin was long supposed to be the produce of a species of *Laurus*, a native of Virginia, which on this account was named *L. Benzoin*: this error was detected by Linnaeus; but the real genus of the plant which yields it was first assigned by Mr. Dryander. *Phil. Trans.* lxxvii. 307.

Qualities. — Benzoin has a very agreeable fragrant odour; but scarcely any taste. Its specific gravity is 1.092. The mass is white and brownish, or yellowish, somewhat translucent, brittle, and breaks with a resinous fracture. When heated it exhales white fumes of a very fragrant, pungent odour, which are volatilized benzoic acid. Boiling it in water, lime and water, or solutions of the mixed alkalies, extracts the benzoic acid it contains, which can be afterwards separated by the addition of an acid. Sulphuric acid dissolves benzoin, and benzoic acid sublimes. Nitric acid assisted by heat dissolves it with violence, and the solution, on cooling, becomes turbid, and crystals of benzoic acid separate. In both these processes artificial tannin also is formed. Alcohol and ether readily dissolve this balsam, which is again precipitated from the tincture, in the form of a white powder, by the addition of water. According to Mr. Brande's analysis, 100 parts of benzoin distilled alone, yield of benzoic acid 9.0. Acidulous water 5.5. Butyraceous empyreumatic oil 60.0. Charcoal 22.0. Carburetted hydrogen and carbonic acid 3.5 parts.¹

Medical properties and uses. — Benzoin is regarded as expectorant; and was formerly employed in asthmas and other pulmonary affections; but it is scarcely ever ordered in modern practice; and is principally used for preparing the acid.

Official preparations. *Acidum benzoinum*. L. E. D. *Tinctura Benzoini composita*. L. E. D.

SUCCINUM.² *Lond. Edin. Dub.* Amber.

Syn. Succin (F.) Ambra (I.) Ambar (S.)

This substance is dug out of the earth in Ducal Prussia, near the sea coast; and is thrown in considerable quantity on the sea shore of Polish Prussia and Pomerania, particularly after tempestuous west or north-west winds.³ It is evidently of vegetable origin, and the lumps occasionally inclose small pieces of twigs and insects in their substance. The greater part of what is brought to this country comes from the Baltic; and a small quantity from Catania, in Sicily, packed in chests.

Qualities. — Amber is insipid, and also inodorous, except when heated, when it emits a fragrant odour. It is brittle, light, hard, and transparent; with a considerable degree of lustre; is commonly of a golden yellow or brown colour, but occasionally colourless, and is electric. Its specific gravity is 1.065. It softens when heated, and in a strong

¹ *Nicholson's Journal*, x. 86. *Thomson's Chemistry*, 4th ed. v. 129.

² *Ηλεκτρον* Græcorum.

³ It is found in small quantities on the east coast of Britain; and small pieces of it are occasionally found in the gravel-pits round London. The largest mass of amber ever found, was met with near the surface of the ground in Lithuania. It weighs 18lbs. and is preserved in the royal cabinet at Berlin.

heat burns, leaving few ashes. It is nearly insoluble in water, to which, however, it gives, when it is boiled with it, a sweetish odour, a yellow colour, and a bitter taste. Alcohol takes up about one-eighth part of amber, forming a tincture which is rendered milky by the addition of water, and precipitates a resin. The alcoholic solution contains a free acid. With boiling fixed alkalies it forms a soap; and even a cold weak solution of potash dissolves it, requiring, however, a considerable length of time. Sulphuric acid converts amber into a black resinous mass. Nitric acid, assisted by heat, acts violently upon it; nitrous gas is emitted, and the amber is ultimately entirely dissolved. Its constituents appear to be chiefly resin, an empyreumatic oil, and succinic acid.

Use. — Amber, although it was in high estimation among the ancients as a medicine, is now only used in pharmacy for the purpose of obtaining the oil and acid which it yields by distillation.

Official preparations. *Acidum succinicum*. E. D. *Oleum Succini*. L. E. D.

SULPHUR. *Lond.* SULPHUR SUBLIMA'TUM. *Lond. Edin. Dub.* Sulphur. Sublimed Sulphur.

Syn. Soufre (F.) Schwefel (G.) Zolfo; Solfo (I.) Azufre (S.) Kibreet (Arab.) Ghén-daguno (Tam.) Gandhaca (San.)

Sulphur is found native in the neighbourhood of volcanoes; and sometimes, although rarely, in veins traversing primitive rocks. At the Solfatara near Naples, it is dug up in a state of comparative purity, being mixed with a white earth only, from which it is separated by sublimation, and the sulphur thus freed is melted, and cast into moulds forming the roll sulphur of commerce. It is imported into this country chiefly from Sicily¹ and Naples: but a large proportion of what is used in this country is obtained from the roasting of pyrites. At the Pary's mines in Anglesea were works for this purpose on a large scale; where, in working the copper pyrites, the sulphur volatilized in the roasting, was collected in chambers which were connected with the domes of the furnaces by means of horizontal flues. Each chamber had a door, by means of which it was cleared of the sulphur once in six weeks. This is the general mode of obtaining sulphur from pyrites, and thus procured, it is in rough, pulverulent, spongy crusts, of a dirty grayish yellow colour. In order to purify it, the crusts are broken and thrown into a boiler, in which it melts; and after the impurities are separated by skimming and subsidence, it is cast into cylindrical moulds, forming roll sulphur; or

¹ In Sicily it is procured from Samatino, Gallati, Trabria, Pentellaria, Licati, Salato, Palmo, Tavara, Girgenti, and Falconara.

into cones about two feet high, which form the loaf sulphur of commerce.¹

The common English roll sulphur is said often to contain a full fifteenth part of orpiment, while the Sicilian sulphur contains seldom more than 3 per cent. of a simple earth; and therefore is justly preferred. Both of them are purified in the large way by conducting the vapour of melted sulphur into close chambers, where it concretes in the form of a fine powder: but for medicinal use, that which is sublimed by heating in a sand-bath, an earthen cucurbit, charged with roll sulphur, and conveying the vapours to be concreted into a set of aludels placed round the cucurbit is to be preferred. Prepared in either mode it is the *Sulphur sublimatum*² of the pharmacopœias.

Qualities. — Roll sulphur is a crystallized brittle solid body of a yellow colour, has a peculiar well-known odour when rubbed or heated, and is insipid. It breaks from the heat of the hand, when held in it for a short time; and becomes electrical when rubbed. Its specific gravity is 1.99. *Sublimed sulphur* is in the form of a very bright yellow powder, and contains a minute portion of sulphuric acid, from which it can be separated by washing it with water. Sulphur is fused at 224° Fahr.; and, what is singular, by increasing the heat to 320° it becomes thick and viscid, and the temperature augments to 550°, when copious fumes arise.³ When heated in the air it inflames at 300°, and burns with a pale blue flame, emits pungent suffocating vapours, and becomes acidified. It is insoluble in water and alcohol; but is soluble in oils, and combines with the alkalies, and many of the earths, and metallic substances. From the experiments of Davy, there is reason to believe that sulphur is a triple compound of oxygen, hydrogen, and a peculiar base.⁴

Medical properties and uses. — Sulphur is laxative, and a stimulating diaphoretic. From the gentleness of its operation on the bowels, it is one of the best means for keeping them lax in hæmorrhoidal affections; and the diaphoresis which it at the same time excites has rendered it serviceable in chronic rheumatism and catarrh, and in atonic gout, rickets, asthma, and other pulmonary affections not attended with acute inflammation. It is supposed that it combines with hydrogen in the stomach. It manifestly transpires through the skin, perhaps, however, in the state of sulphuretted hydrogen, which may be the cause of silver in the pockets of those who take sulphur being blackened. It is specific in scabies and some other cuta-

¹ The sulphur vivum of the shops is the impure dregs of this process.

² *Θειον κρυσταλλωμενον* Dioscoridis.

³ Irvine's *Chemical Essays*, 473.

⁴ Phil. Trans. 1809.

neous affections, in which it is applied externally, and taken internally at the same time.

The dose may be from ʒj to ʒiij, mixed into an electuary with syrup or treacle, or in milk. To promote its purgative power it may be combined with super-tartrate of potash; and in hæmorrhoidal cases with magnesia.

Official preparations. *Sulphur lotum*. L. E. D. *Sulphur præcipitatum*. L. *Unguentum Sulphuris*. L. E. D. *Unguentum Sulphuris compositum*. L.

SUPER-TARTRAS POTASSÆ IMPURUS. *Edin.*
TARTARUM. *Lond.* Impure Super-tartrate of potash.

Syn. Tartre (F.) Rober Weinstein (G.) Tartaro bianco (I.) Tartaro (S.)

This is a saline matter, which exists in the juice of the grape; and is deposited on the sides of casks of wine, in the form of a crust, during the continuance of the slow fermentation which goes on in wine, till it attains the greatest perfection age can give it. It is well known by the name of *tartar*, and is named red or white tartar, as it is more or less coloured, owing to the nature of the wine from which it is deposited. Besides colouring matter, it contains extractive, potash, combined with tartaric acid in excess, and tartrate of lime. It is only used for preparing the next article.*

SUPER-TARTRAS POTASSÆ. *Edin.* **POTASSÆ SUPERTARTRAS.** *Lond.* **TARTARUM CRYSTALLI.** *Dub.* Super-tartrate of potash, Crystals of tartar.

Syn. Tartrate acidule de Potasse (F.) Gereinigter Weinstein (G.) Cremore di tartaro; ossitartrato ossidulo di Potassa (I.)

This is the above-mentioned saline crust purified. It is first reduced to powder, then dissolved in boiling water in tubs, and the clear fluid poured off from the sediment. The clear solution is then allowed to remain at rest, when it deposits brown crystals of tartrate of potash, which are boiled in copper vessels with the mother liquor; and clarified by throwing in whites of eggs, and some finely sifted wood ashes. An effervescence immediately takes place, and a red scum is thrown up, which is carefully skimmed off with a perforated skimmer; and the throwing in of the wood ashes, with the subsequent skimming, are repeated for fourteen or fifteen times; after which the liquor is taken from the fire, and allowed to remain at rest for three days. On the fourth day a dirty white saline crust is removed from the surface, and two thirds of the liquor ladled out. The crystals which now form are white and clean, and require no further preparation than drying on a wicker frame. In some places, instead of wood ashes, a portion of pure clay is diffused

* A large quantity of tartar comes from Sicily: the white is procured chiefly from Palermo, Marsala, and Catania; the red from Mascali, Messina, Melazzo, and Vittoria.

through the boiling solution. The exposure of the crystals on cloths to the air and light whitens them very considerably.¹

Qualities. Super-tartrate of potash is inodorous, and when allowed to dissolve in the mouth, which it does very slowly, and feeling gritty under the teeth, has a harsh acid taste. Its crystals are small and irregular, generally run together into little masses, which are of a white colour, semi-transparent, brittle, and easily reduced to powder. Its specific gravity is 1.953. It requires for its solution 30 parts of boiling water, and 120 of cold water. The solution decomposes spontaneously by keeping; a mucous matter is deposited, and there remains a solution of carbonate of potash coloured with a little oil.² According to the analysis of Thenard, 100 parts of pure supertartrate of potash contain 57 of tartaric acid, 33 potash, and 7 of water³; but according to Berzelius, the proportions are, acid 70.45, potash 24.80, and water 4.75.

Medical properties and uses.—This salt is purgative, diuretic, and refrigerant. As a purgative it is frequently employed, on account of its taste being less unpleasant than the generality of saline cathartics; but it is apt to excite too much absorption when long used, producing emaciation, and also disordering the digestive organs. This property, however, of exciting the action of the absorbents, is taken advantage of with great effect in the cure of dropsy, particularly ascites; in which the supertartrate of potash has been found extremely efficacious. It generally occasions a considerable discharge of serous fluid into the bowels, which is thrown off in the form of watery stools, at the same time that the discharge by urine is much augmented. The water in the cavity of the abdomen is thus rapidly carried off: and the chances of a return of the disease are supposed to be fewer than when other diuretics are employed. We are of opinion, however, that in cases complicated with hepatic obstructions the effects of this remedy are very uncertain. It may be advantageously united with squill; and, owing to the exhaustion it occasions, its use should be followed by preparations of iron, and other tonics. As a refrigerant, super-tartrate of potash dissolved in water, and the solution sweetened with sugar, is a pleasant beverage in febrile diseases, when its purgative quality is not likely to prove injurious. As a purgative and hydragogue the dose is from $\mathfrak{z}\text{iv}$ to $\mathfrak{z}\text{vj}$, in the form of electuary; and this dose for the latter purpose must be repeated until the kidneys are affected; diluting freely during its use.

¹ Schaub says, it may be purified by simply boiling it with powdered recent charcoal, and very white crystals obtained. *Ann. de Chimie*, xlix. 64.

² This decomposition was first described by Berthollet, in 1782. *Mem. Par. Thomson's Chemistry*, 4th edit. vol. iii. 93.

³ *Annales de Chimie*, vol. xxxviii. p. 39.

Official preparations. *Ferrum tartarizatum*. L. D. *Potassæ Tartras*. L. E. D. *Antimonium tartarizatum*. L. E. D. *Soda tartarizata*. L. E. D.

SUS. *Syst. Nat. Gmelin*. i. 217.

Cl. 1. Ord. 6. Mammalia Belluæ.

G. 35. Fore-teeth four in the upper jaw converging, and six prominent in the lower jaw. Tusks two shorter in the upper jaw; and two in the under jaw displayed. Snout truncated, prominent, moveable. Feet cloven.

Species 1. *Sus Scrofa*.¹ The Hog. *Jonst. quadr.* 99. t. 47.

Official. ADEPS. Lond. ADEPS SUILLUS. Edin. Dub. Fat. Hog's lard.

Syn. Sain doux (F.) Schweineschmalz (G.) Lardo (I.) Pringue (S.) Pánnie Colupoo (Tam.)

The hog is too well known to require a particular description. It is an inhabitant of the greater part of the temperate regions of the globe; the wild and the domestic being varieties of the same species; and of both there are several sub-varieties. The period of gestation of the sow is four months, and the offspring numerous, occasionally exceeding twenty at a litter, which the boar sometimes devours. The hog does not shed its teeth, and seldom lives beyond twenty-five or thirty years. It is much infested with vermin; and is subject to several diseases, particularly hydatid dropsy, scrophula, and scabies. Its food is of a vegetable nature; but it is asserted that pepper kills it. As an article of diet, the flesh of the hog, when the animal has been castrated and properly fed², is very palatable, and not unwholesome; and when salted, keeps better than most other meats. But the frequent use of pork is said to favour obesity, and occasion disorders of the skin, particularly in the sedentary. The lard, which is the official part of the hog, is obtained chiefly from the flank of the animal. To free it from the membranes and vessels, it is cut in small pieces, then very well washed in water, until the water comes off colourless, and afterwards melted with a very gentle heat in a shallow vessel, continued on the fire till the whole of the water is evaporated. While melted, it is run into bladders, in which it concretes; and is thus brought to market.

Qualities. — Lard is inodorous, tasteless, and white; soft, and nearly semifluid. Exposed to a heat of 97° it melts, and concretes again when cooled. It is insoluble in water, alcohol, and ether: but is dissolved by the strong acids, being at the same time decomposed; and, like the fixed oils, it combines

¹ Tr. Aristotle.

² The qualities of the flesh depend much on the diet of the animal. Pork fed at a flour mill is always good: and Russel says, that which is fed near Aleppo on liquorice root, which grows in great abundance in the desert, is fat, delicious, and remarkably digestible.

with the alkalies and forms soap. It is oxidized, if, when melted, a little nitric acid be stirred into it; and assumes a greater degree of firmness, with a yellow colour. By destructive distillation it affords results very similar to those obtained from the analysis of fixed oil; and appears to be a compound of oxygen, hydrogen, and carbon in unknown proportions. From the experiments of Chevreul, it appears to consist of a mixture of two distinct oily substances; one of which is solid at the usual temperature, and has been named by him *stearin*; and the other liquid, which he has named *elain*. The proportion in 100 parts of lard, is, of *stearin* 38, *elain* 62 parts.* When lard is long exposed to a warm air, it becomes yellow, emits a foetid odour; and, owing to oxygen being attracted from the atmosphere, the sebatic acid is formed. This state of rancidity may, in some degree, be removed by washing it with very pure soft water; which during the operation becomes acid, and reddens litmus paper.

Medical properties and uses. — Lard is emollient; and owing to its softness and unctuousity is preferable to fat as a friction; but it is seldom used for this purpose; and is chiefly employed in the formation of ointments.

Official preparations. *Adeps preparata*. L. D.

SWIETENIA. *Spec. Plant. Willd.* ii. 557.

Cl. 10. Ord. 1. Decandria Monogynia. Nat. ord. Trihilatæ. Linn. Meliæ Juss.

G. 843. Cal. five-cleft. Pet. five. Nect. cylindric, bearing the anthers at the mouth. Capsules five-celled, woody, opening at the base. Seeds imbricate, winged.

Sp. 2. S. *Febrifuga*. Febrifuge Swietenia. Roxburgh, *Coromandel Plants*, i. 18. t. 17.

Official. SWIETENIA FEBRIFUGA; CORTEK. Dub. The bark of Febrifuge Swietenia.

Syn. *Rahena* (H.) *Shem mairum* (Tam)

This is a native of the East Indies, growing in the mountains of Rajahmundry Circar. It is a very lofty tree, with a large shady head, and covered with a gray scabrous bark. The leaves are alternate and abruptly pinnated; composed of three or four pairs of opposite, petiolated, oval, obtuse leaflets; each from three to five inches long, and from two to three broad, smooth, shining, and the lower side extending a little further down on the petiole than the upper side: the flowers are middle-sized, white, inodorous; and disposed in large, terminating, diffuse panicles, furnished with minute bracts: the calyx is inferior: the nectary scarcely half the length of the petals and bellied; the filaments are very short, and inserted just within the mouth of the nectary: the germ is con-

* *Annales de Chimie*, t. 94. p. 129.

cal, bearing a thick tapering style, supporting a large targeted stigma, which shuts up the mouth of the nectary: the capsule is large, ovate, and five-valved, with the valves gaping from the top.

Qualities. — The bark of febrifuge Swietenia is very bitter and austere, yet is not nauseous. It is brittle, compact, of a light red colour internally, and externally covered with a rough, gray, inert epidermis. Water extracts its virtues both by infusion and coction, and yields an astringent extract resembling kino; they are partially taken up by alcohol, and the aqueous and spirituous preparations do not suffer decomposition when mixed.

Medical properties and uses. — The bark of this species of Swietenia are astringent and tonic. In India, it is used for the cure of intermittents, with considerable advantage; and has also been found efficacious in most of the diseases in which the cinchona bark proves serviceable. It is very little employed in Europe, and is not found generally in the shops. The dose, in substance, pulverized, is half a drachm.

TAMARINDUS. *Spec. Plant. Willd.* iii. 577.

Cl. 16. *Ord.* 1. Monadelphia Triandria. *Nat. ord.* Lomentaceæ *Linn.* Leguminosæ *Juss.*

G. 1250. *Calyx* four-parted. *Petals* three. *Nectary* of two short bristles under the filaments. *Legume* pulpy.

Sp. 1. *T. indica.* The Tamarind tree. *Med. Bot.* 2d ed. 448. t. 161. (Balam-pulli) *Rheede, Hort. Malab.* i. 39. t. 23.

Officinal. TAMARINDI PULPA. *Lond.* TAMARINDI INDICÆ FRUCTUS. *Edin.* TAMARINDUS; FRUCTUS. *Dub.* The pulp, or preserved fruit of the Tamarind.

Syn. Tamerins (*F.*) Tamarinden (*G.*) Tamarindo (*L.*) Tamarindo (*S.*) Umblie (*H. & Arab.*) Amlica (*Som.*)

This tree is a native of the East and West Indies, of Arabia, and Egypt. It is a large beautiful spreading tree. The leaves are abruptly pinnate, composed of sixteen or eighteen pairs of sessile leaflets, half an inch only in length, and one-sixth of an inch broad, of a bright green colour, downy, oblong, entire, and obtuse: the flowers are in loose bunches of five or six, which come out from the sides of the branches: the calyx is of a straw yellow colour, and deciduous: the petals also yellowish, and beautifully variegated with red veins; ovate, concave, acute, indented, and plaited at the edge; and the filaments purplish, bearing incumbent brownish anthers: the pods are thick, compressed, and of a dull brown colour when ripe: those from the West-Indies from two to five inches long, with two, three, or four seeds; those from the East Indies are twice as long, and contain five, six, or seven seeds: the seeds in both are flat, angular, shining, and lodged in a dark pulpy matter.

In the West Indies the pods are gathered in June, July, and August, when fully ripe; and the fruit being freed from the