one foot in two days; and that it does not aſcend at all unleſs the mid-day beat be above 40. He obſerved that it moves with more velocity through young than through old branches. In one young branch it moved through ſeven feet in one day, the thermometer being at 49, while it moved in the trunk of the tree only ſeven feet in ſeven days. Dr Walker has thus explained the reaſon why the buds on the extremities of branches un­fold firſt; becauſe they are placed on the youngeſt wood, to which the ſap flows moſt abundantly.

The effects produced by the motion of the ſap de­ferve to be attended to. In thoſe parts to which it has mounted, the bark eaſily ſeparates from the wood, and the ligneous circles may, without difficulty, be de­tached from one another. The buds begin to ſwell and their ſcales to ſeparate, while thoſe branches to which the ſap has not aſcended remain cloſely folded. When the ſap has reached the extremities of the branch­es, and has thus pervaded the whole plant, it is ſoon covered with opening buds and ceaſes to bleed. The bleeding ceaſes firſt in the upper parts of the tree, and in the lower parts ſucceſſively downwards, and the wood becomes dry. An inverted branch flows more copiouſly when cut than thoſe which are erect. This is a proof that the aſcent of the ſap is not occaſioned by capillary attraction, for water which has riſen in a ſmall glaſs tube by this attraction will not deſcend when the tube is in­verted.

It is evident that there is an intimate connection be­tween heat and the aſcent of the ſap. It did not begin to flow till the thermometer ſtood at a certain point: when it fell below 40, it was arreſted in its progreſs. The ſouth fide of the tree, when the ſun was bright, bled more profuſely than the north fide; and at ſun-ſet the inciſions at the top ceaſed to bleed, where it was expoſed moſt to the cold air, while it ſtill continued to flow from the incifions next to the ground; the ground retaining its heat longer than the air.

Sap, in ſieges, is a trench, or an approach made under cover of 10 or 1 2 feet broad, when the beſiegers come near the place, and the fire from the garriſon grows ſo dangerous that they are not able to approach uncovered. —There are ſeveral forts of ſaps; the ſingle, which has only a ſingle parapet; the double, having one on each ſide; and the flying, made with gabions, &c. In all ſaps traverſes are left to cover the men.

SAPINDUS, the soap-berry tree, in botany: A genus of the digynia order, belonging to the octandria claſs of plants; and in the natural method ranking un­der the 23d order, *Trihilatae.* The calyx is tetraphyllous; the petals four; the capſules are fleſhy, connate, and ventricoſe.

The ſpecies are four, the ſaponaria, ſpinoſus, trifoliatus, and chinenſis. The ſaponaria, with winged leaves, grows naturally in the iſlands of the Weit In­dies, where it riſes with a woody ſtalk from 20 to 30 feet high, fending out many branches garniſhed with winged leaves compoſed of ſeveral pair of ſpear-ſhaped lobes. The midrib has a membranaceous or leafy border, running on each fide from one pair of lobes to the other, which is broadeſt in the middle between the lobes; the flowers are produced in looſe ſpikes at the end of the branches; they are ſmall and white, ſo make no great appearance. Theſe are ſucceeded by oval berries as large as middling cherries, ſometimes

ſingle, at others, two, three, or four are joined to­gether; theſe have a ſaponaceous ſkin or cover, which incloſes a very ſmooth roundiſh nut of the ſame form, of a ſhining black when ripe. The ſkin or pulp which ſurrounds the nuts is uſed in America to waſh linen; but it is very apt to burn and deſtroy it if often uſed, being of a very acrid nature.

Theſe plants are propagated by ſeeds; they muſt be put into ſmall pots, and plunged into a hot-bed of tanners bark. In five or ſix weeks the plants will appear, when the glaſſes of the hot-bed ſhould be raiſed every day in warm weather, to admit freſh air to the plants. In three weeks or a month after the plants appear, they will be fit to be tranſplanted, when they muſt be ſhaken out of the pots, and carefully part­ed, ſo as not to injure their roots, and each planted into a ſeparate ſmall pot, and plunged into the hot-bed again, obſerving to ſhade them from the ſun until they have taken new root; after which time they muſt have free air admitted to them every day when the weather is warm, and will require to be frequently wa­tered.

SAPONARIA, Sopewort, in botany: A genus of the digynia order, belonging to the decandria claſs of plants; and in the natural method ranking under the 22d order, *Caryoρhylleae* The calyx is monophyllous and naked; there are five ungulated petals; the capſule is oblong and unilocular.

There are eight ſpecies, the officinalis, vaccaria, cretica, porrigens, illyrica, ocymoides, orientalis, and lutea. The officinalis, which is a Brſtiſh plant, has a creeping root, ſo that in a ſhort time it would fill a large ſpace of ground. The ſtalks are about two feet high, and of a purpliſh colour. The footſtalks of the flowers ariſe from the wings of the leaves oppoſite; they ſuſtain four, five, or more purple flowers each; which have generally two ſmall leaves placed under them. The ſtalk is alſo terminated by a looſe bunch of flowers growing in form of an umbel; they have each a large ſwelling cylindrical empalement, and five broad obtuſe petals, which ſpread open, of a purple colour. Theſe are ſucceeded by oval capſules, with one cell filled with ſmall ſeeds. —The decoction of this plant is uſed to cleanſe and ſcour woollen cloths: the poor people in ſome countries uſe it inſtead of ſoap for waſhing; front which uſe it had its name.

SAPOR, taste. See Taste, and Anatomy, n 139.

SAPOTA, Plum, in botany. See Achras.

SAPPERS, are ſoldiers belonging to the royal ar­tillery, whoſe buſineſs it is to work at the ſaps, for which they have an extraordinary pay. A brigade of ſappers generally conſiſts of eight men, divided equally into two parties; and whilſt one of theſe parties is advancing the ſap, the other is furniſhing the ga­bions, faſcines, and other neceſſary implements. They relieve each other alternately.

SAPPHIRA, was the wife of a rich merchant in Gueldres, and equally diſtinguiſhed for her beauty and her virtue. Rhinſauld, a German officer, and gover­nor of the town of Gueldres, fell in love with her; and not being able to ſeduce her either by promiſes or preſents, he impriſoned her huſhand, pretending that he kept up a traiterous correſpondence with the enemies of the ſtate. Sapphira yielded to the paſſion of the go-