border of light freſh earth, but muſt be watered and ſhaded in hot dry weather, until they have taken root; after which they will require no farther care but to keep them clean from weeds till autumn, when they ſhould be tranſplanted where they are deſigned to re­main: but if the ground is not ready by that time to receive them, it will be proper to let them remain in the border until ſpring; for if they are tranſplanted late in autumn, they are liable to be deſtroyed by cold in winter.

SANTORINI, an iſland of the Archipelago, to the north of Candia, and to the ſouth-weſt of Nanphio. It is eight miles in length, and near as much in breadth, and almoſt covered with pumice-ſtone, whence the ſoil in general muſt be dry and barren; it is, however, greatly improved by the labour and in- duſtry of the inhabitants, who have turned it into a garden. It affords a great deal of barley, plenty of cotton, and large quantities of wine. Fruit is ſcarce except figs; and they have neither oil nor wood. The inhabitants are all Greeks, and are about 10,000 in number. Pyrgos is the capital town, and there are ſeveral little towns and villages. They have but one ſpring in the iſland, for which reaſon they preſerve the rain-water in ciſterns. Though ſubject to the Turks, they chooſe their own magiſtrates. E. Long. 25. 5. N. Lat. 39. 10.

SANZIO (Raphael). See Raphael.

SAO, a territory, called a kingdom, of Africa, on the gold-coaſt of Guinea, hardly two miles in length along the ſhore. It produces abundance of Indian corn, yams, potatoes, palm-wine, and oil. The in­habitants are very treacherous, and there is no dealing with them without a great deal of caution. It con­tains ſeveral villages, of which Sabo is the principal; and the Dutch have a fort here called *Naſſau.*

SAONE, a conſiderable river of France, which has its ſource in mount Voſgue, near Darney; runs through the Franche Comte, Burgundy, Beaujolois; and falls into the Rhone at Lyons. It paſſes by Gray, Cha­lons, and Maſcon.

SAP, the juice found in vegetables.

We obſerved, when treating of Plants, that it has been long diſputed whether the ſap of plants be analo­gous to the blood of animals, and circulates in the fame manner. We alſo mentioned the concluſions that Dr Halesdrew from his numerous experiments, which were all in oppoſition to the doctrine that the lap circulates. As the ſubject is curious and intereſting, and as addi­tional light has been thrown upon it of late years, we wiſh to communicate it to our readers as fully as our limits will permit.

As the vegetable economy is ſtill but imperfectly underſtood, and experiments made for tracing the mo­tion of the ſap may lead to important diſcoveries, we are happy to find, that of late years this ſubject has been again revived. Dr Walker, profeſſor of Natural Hiſtory in the univerſity of Edinburgh, has publiſhed in the 1ſt volume of the Philoſophical Tranſactions of Edinburgh an account of a courſe of very accurate and ingenious experiments, accompanied with obſervations and concluſions made with a caution which inſpires confidence, and is indeed worthy of a diſciple of Bacon. He is the firſt perſon, as far as we know, who thought of comparing the thermometer with the motion of the ſap,

It is well known that in the ſpring vegetables con­tain a great quantity of ſap; and there are ſome trees, as the birch and plane, which, if wounded, will diſcharge a great portion of it. Whence is this moiſture deri­ved? Whether is it imbibed from the atmoſphere, or does it flow from the ſoil through the roots? Theſe are the queſtions which require firſt to be anſwered; and Dr Walker’s experiments enable us to anſwer them with confidence.

He ſelected a vigorous young birch, 30 feet high and 26 inches in circumference at the ground. He bored a hole juſt above the ground on the 1ſt of Fe­bruary, and cut one of its branches at the extremity. He repeated this every ſecond day; but no moiſture ap­peared at either of the places till the 5th of May, when a ſmall quantity flowed on making an inciſion near the ground. He then cut 21 inciſions in the trunk of the tree, on the north side, at the diſtance of a foot from one another, and reaching from the ground to the height of 20 feet. The inciſions were ſolid triangles, each side being an inch long and an inch deep, and penetrating through the bark and wood. Dr Walker viſited the tree almoſt every day for two months, and marked exactly from which of the inci­ſions the ſap flowed. He obſerved that it flowed from the loweſt inciſion firſt, and gradually aſcended to the higheſt. The following table will ſhow the progreſs of the ſap upwards, and its correſpondence with the thermometer.

The firſt column is the day of the month on which the obſervation was made; the ſecond expreſſes the number of inciſions from which the ſap flowed on the day of the month oppoſite; and the third column the degree of the thermometer at noon. Some days are omitted in March, as the inciſions, though made on the 5th, did not bleed till the 11th. Some days are alſo paſſed over in April, becauſe no obſervation was made on account of rain.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| March. | N of In. | Γher. Noon. |  | March. | N. of In. | Ther. Noon. |
| 5 | — | 46 |  | 30 | 8 | 50 |
| 11 | 2 | 49 |  | 31 | 7 | 62 |
| I2 | 2 | 49 |  |  |  |  |
| 13 | 1 | 44 | April | 2 | 7 | 46 |
| 14 | 4 | 48 |  | 4 | 10 | 53 |
| 15 | 5 | 52 |  | 7 | 11 | 49 |
| 16 | 5 | 47 |  | 8 | 11 | 48 |
| 17 | 4 | 44 |  | 9 | 12 | 50 |
| 18 | 5 | 47 |  | 10 | 13 | 53 |
| 19 | 6 | 48 |  | 11 | 13 | 45 |
| 20 | 5 | 44 |  | 12 | 13 | 44 |
| 21 | 7 | 48 |  | 13 | 13 | 43 |
| 22 | 7 | 45 |  | 14 | 14 | 55 |
| 23 | 8 | 46 |  | 15 | 14 | 49 |
| 24 | 9 | 47 |  | 16 | 16 | 56 |
| 25 | 9 | 42 |  | 18 | 16 | 50 |
| 26 | 7 | 39 |  | 19 | 17 | 54 |
| 27 | 8 | 45 |  | 20 | 19 | 56 |
| 28 | 8 | 49 |  | 21 | 20 | 54 |
| 29 | 8 | 46 |  | 22 | 21 | 52 |

Dr Walker found that the ſap aſcends through the wood, and ſtill more copiouſly between the wood and the bark; but none could be perceived aſcending through the pith or the bark. He found alſo, that when the thermometer at noon is about 49, or between 46 and 50, the ſap riſes about one foot in 24 hours; that when the thermometer is about 45 at noon, it aſcends about