

dreamed, would have saved them the operation of battering-rams and other engines of war; and, even at present, might be employed, in many cases, with advantage. I am convinced by my eyes, that, when these walls slipt, if the cut made for rebuilding them had not been speedily filled with strong mason-work, the ancient walls, and the two towers that have subsisted in good condition nine hundred years, and one of which is 125 feet high, would have tumbled into the valley, along with the rocks upon which they are founded. As most of our hills composed of calcarious stones rest upon a clay base, the first strata of which are always more or less moistened with the waters that filtrate through the crevices of the rocks, it appears to be certain, that, by exposing these moistened beds to the air by a cut, the whole mass of rocks and earth resting upon the clay would slip, and in a few days tumble into the cut, especially during wet weather. This mode of dismantling a fortress is more simple than any hitherto invented; and experience has convinced me that its success is certain.

II.

Of Turf.

TO what I have formerly remarked concerning turf, I shall subjoin the following facts:

In the jurisdiction of Bergues-Saint-Winock, Furnes, and Bourbourg, we find turf at three or four feet below the surface. These beds of turf are generally two feet thick, and are composed of corrupted wood, of entire trees with their branches and leaves, and particularly of filberds which are known by their nuts, and the whole is interlaced with reeds and the roots of plants.

What is the origin of these beds of turf, which extends from Bruges through the whole flat country of Flanders as far as the river Aa, between the downs and the high country in the environs of Bergues, &c.? In remote ages, when Flanders was only a vast forest, a sudden inundation of the sea must have deluged the whole country, and, in retiring, deposited all the trees, wood, and twigs, which it had eradicated and destroyed in this lowest territory of Flanders; and this event must have happened in the month of August or September; because we still find the leaves of trees, as well as nuts on the filberds. This inundation must have taken place long before that

that province was conquered by Julius Cæsar, since no mention is made of it in the writings of the ancients*.

In the bowels of the earth we sometimes find vegetables in a different state from that of common turf. For example, in Mount Canelon, near Compeigne, we find, on one side of the mountain, quarries of fine stones and the fossil oysters formerly mentioned, and on the other side, we meet with a bed of the leaves of all kinds of trees, and also reeds, the whole blended together and inclosed in mud. When these leaves are stirred, we perceive the same musty odour which we feel on the margin of the sea; and these leaves preserve their odour during several years. Besides, the leaves are not destroyed; for we can easily distinguish their species: They are only dry, and slightly united to each other by the mud†.

'We distinguish,' M. Guettard remarks, 'two species of turf: The one is composed of marine, and the other of terrestrial plants. We suppose the first to have been formed when the sea covered all those parts of the earth which are now inhabited. The second is supposed to have been superinduced upon the former. According to this system, it is imagined

* Mem. pour la Subdélégation de Dunkerque, relativement à l'Hist. Nat. de ce Canton.

† Lettre de M. Lefchevin à M. de Buffon; Compeigne, 8 Aout 1772.

that

'that the currents carried the sea-plants into the hollows formed by the mountains, which were elevated above the waters, and, after being tossed about by the waves, were deposited in the hollows.

'This origin of turf is not impossible: The great quantity of sea-plants is sufficient to account for the phenomenon. The Dutch even alledge, that the goodness of their turf is owing to the bitumen with which the sea-water is impregnated, and that they were formed by sea-weeds. . . .

'The turf-pits of Villeroiy are situated in the valley through which the river Effone runs; and part of this valley extends from Roissy to Escharcon. . . . It is even near Roissy that turfs were first dug. . . . But those near Escharcon are the best. . . .

'The meadows where turf is dug are open and bad: They are filled with rushes, horse-tail, and other plants which grow in bad soils. These meadows are dug to the depth of eight or ten feet. . . . Next to the upper stratum, there is a bed of turf about a foot thick, and impregnated with river and land shells. . . .

'This bed of turf filled with shells is commonly earthy: Those which succeed are nearly of the same thickness, and are always better as we descend. These turfs are of a blackish brown colour, intermixed with reeds, rushes, and

and

' and other plants. We see no shells in these beds. . . .

' In masses of turf we sometimes find the stems of willow and poplars, and sometimes the roots of these and similar trees. On the Escharcon side, an oak was discovered at the depth of nine feet. It was black and almost corrupted. It crumbled into dust, after being exposed to the air. Another was found, on the Roissy side, between the soil and the turf, at the depth of two feet. Near Escharcon, the horns of a stag were found three or four feet below the surface. . . .

' Turfs are perhaps equally abundant in the environs of Etampes, as near Villeroy. These turfs contain but very little moss. Their colour is a fine black. They are heavy, and burn well in an ordinary fire. Good charcoal might be made of them. . . .

' The turfs in the neighbourhood of Etampes may be considered as a continuation of those of Villeroy. In a word, all the meadows adjacent to the river of Etampes are probably full of turf. The same remark is applicable to the meadows through which the river Essone runs: These meadows produce the same plants as those of Etampes and Villeroy *.

According to this author, there are in France a number of places from which turf may be ob-

* Mem. de l'Acad. des Sciences, année 1761, p. 350-397.
tained,

tained, as at Bourneville, at Croué, near Beauvais, at Bruneval, in the environs of Péronne, in the diocese of Troyes in Champagne, &c. This combustible substance would be a great resource, if it were used in such places as want wood.

There are likewise turfs near Vitri-le-François, and in the morais along the Marne. These turfs are good, and contain great quantities of acorn shells. The marsh of Saint-Gon in the environs of Châlons is full of turf, which the inhabitants will soon be obliged to use for want of wood *.

III.

Of Subterraneous, Petrified, and Charred Wood.

' IN the territories of the Duke of Saxe-Cobourg, which lie on the frontiers of Franconia and Saxe, and at some leagues from the town of Cobourg, there are found, at a small depth, whole trees so completely petrified, that they were as beautiful and hard as agates. Some specimens of them were given by the Princes of Saxe to M. Schoepflin, who transmit-

* Note communicated to M. de Buffon, by M. Grögen. Aug. 6, 1777.