

organ. The ovary, which is truly inferior, is produced by a discoidal formation. The ovule is lateral. The succession of the development of the leaf-cycle is altogether abnormal.

In describing the pappus of *Sonchus*, the author remarks that its degree of fragility depends upon its state of cultivation; but it cannot yet be decided whether a stony soil plays any part. The fragility depends very closely upon the thickness of the hairs of the pappus, and this is governed by the number of rows of cells which form the hairs. In *Sonchus* the base of the pappus is formed by three or four series of cells; the oldest part of the hairs is the extremity. The very fine pappi of *Sonchus*, when examined by the microscope, present at their extremity a system of hooks, formed, on the average, of five or six cells, arranged upon eight lines, recurved externally in the form of a hatchet; these will probably hereafter furnish specific characters. The author indicates the characters thus displayed by *Sonchus arvensis*, *arboreus*, *asper*, *oleraceus*, *palustris*, and *tenerimus*. All these species, especially the two last, most clearly show this system of recurved teeth, whilst the pappus of *Sonchus divaricatus* departs considerably from them, and more nearly approaches that of the exotic *Rhabdotheca*.—*Bibl. Univ.* October 1864, p. 169.

*On the Remains of Plants found beneath the Swiss Lake-dwellings.*

By Professor O. HEER.

At the late meeting of the Société Helvétique des Sciences Naturelles, on the 23rd of August, Professor Heer exhibited a collection of vegetable remains found under the ancient lake-dwellings of Switzerland. In his remarks upon these remains he referred particularly to some interesting recent discoveries at Robenhausen, on the Lake of Pfäfikon. The subsoil of the layers of peat at Robenhausen is formed by a white mud; above this white mud, and also below the peat, are the vegetable remains, nearly all of which are carbonized. They are evidently the débris of plants that the former inhabitants have thrown into the lake.

The remains of useful plants are particularly interesting for the history of agriculture. Among cereals we find wheat and barley of the following kinds:—A small-grained variety of *Triticum vulgare*, Linn., occurs most frequently at Robenhausen, and also at Wangen, in the Lake of Constance, and at Moosedorf, in the Canton of Berne; a *Triticum vulgare*, with grain of the ordinary size, is also met with. These two varieties have been sent to Prof. Heer from the locality near Olmütz, the age of which is unknown. Near Robenhausen *Triticum turgidum* occurs, a species still cultivated in the south of Europe, but scarcely in Switzerland. At Wangen the *T. dicoccum* and *T. monococcum*, Linn., are known to occur; and *T. Spelta* is found only in the recent lacustrine locality of the île de St. Pierre (age of bronze?). Of barleys, the *Hordeum hexastichum*, Linn., is generally diffused. Its ears, from which the grain has fallen, are found well preserved in most of the lacustrine villages. According to Unger, this barley is also that of the ancient monuments of Egypt; whilst our common barley (*H. vulgare*) is wanting in both localities,



and is, therefore, probably a form of the first-named species produced by cultivation in the course of thousands of years. Lastly, *Hordeum distichum* is found at Wangen and the île de St. Pierre, a district in which it is still generally cultivated. Rye and oats have not hitherto been found in the more ancient habitations (of the stone age); but the *Avena sativa* has been met with in the recent locality of the île de St. Pierre, as also frequently beneath Roman ruins. The *Secale cereale*, Linn., the cultivation of which appears much later in history than that of the other cereals, and did not become general in these regions until towards the middle ages, has recently been found in the above-mentioned locality of Olmütz (age unknown), which is in support of the opinion of A. DeCandolle that Eastern Europe is the native country of rye. Lastly, millet (*Setaria italica*) has lately been found at Robenhausen: this, according to Cæsar, was the chief cereal of the ancient Helvetians, and it is still met with abundantly among Roman ruins.

Along with these ten species of cereals abundant remains of straw are found. The millet cakes found at Robenhausen, and the numerous fragments of round, flattened loaves in which grains of wheat are still recognizable, furnish conclusive evidence of the mode of preparation of food from these cereals. The grain was evidently triturated very imperfectly between plates of stone, and the dough was baked under hot stones and ashes.

The leguminous vegetables present much less variety. It is only in the more recent habitations (of the bronze age) that three leguminous plants are found; these are field-beans (*Vicia Faba*, Linn.), the common pea (*Pisum sativum*, Linn.), a variety with exceedingly small seeds, and the lentil (*Ervum Lens*, Linn.). This species appears at this time to have been diffused over a great part of Europe; for it occurs in lacustrine localities at Parma, as well as in the île de St. Pierre, the Lake of Bienne, &c.

Of fruits, two sorts of apples are found in abundance, viz., 1. a small kind, evidently wild, and 2. a larger sort, undoubtedly cultivated, which occurs sometimes entire, sometimes divided into two or three parts. Pears of a very small kind (wild) occur very rarely. At Robenhausen cherries are found, with large stones. Plums (*Prunus insititia*, Linn.), with small and smooth stones, also occur. The fruits of *Prunus spinosus* and *P. Padus*, the stones of which are frequently found, also appear to have been used as food.

In the lacustrine remains of Switzerland no traces of the vine are found; but at Parma seeds have occurred precisely similar to those of the wild vine (*Vitis sylvestris*). Thus, at the time of the lake-dwellings the vine must have been already naturalized in Upper Italy, of which it does not appear to have been a native.

Only a single textile plant is found, namely flax; and this occurs in great quantity. The seeds, capsules, and stems have been found; and flax has also been met with in cords, and a small quantity in the form of platted work and of varied tissues, which leads to the conclusion that it was an important object of industry. We know that flax also played an important part among the Egyptians. It is very remarkable that both the seeds and the capsules of the flax of the



lake-dwellers were much smaller than ours; in form and size they approach much more closely to *Linum perenne*, Linn., a species which still grows in the wild state in Germany; so that we might conclude that our common flax is a form produced by cultivation from the *L. perenne*.

A great number of remains of wild plants have also been recognized. The following species of eatable fruits and tubers have been observed:—1. Raspberries (*Rubus idæus*, Linn.); 2. Strawberries (*Fragaria vesca*, Linn.), of which the seeds are found in masses; 3. the Elder (*Sambucus nigra*), the berries already serving for the preparation of cakes; 4. the fruit of *Trapa natans*, which was formerly widely diffused, but is now an almost extinct plant among us; 5. a great quantity of nuts, belonging to the two forms which have been recently distinguished—*Corylus avellana*, Linn., and *C. glandulosa ovata*, Willd.; 6. seeds and leaves of the beech (*Fagus sylvatica*, Linn.), indicating the abundant use of the fruit of that tree; 7th and lastly, the peculiar tubers of a plant similar to our *Equisetum Telmateja*, Linn., which is very rich in starch, serving, no doubt, as food for the inhabitants, as it is likewise found carbonized among the grains of wheat.

Of weeds, we find at Robenhausen the carbonized capsules of a *Silene* and of the poppy (*Papaver Rhæas*, Linn.), which still occur in our country.

At Robenhausen, as previously at Meilen, much amadou (*Polyporus igniarius*) is found, and at Parma also *Dædalea quercina*. Of the conifers three have been found—the berries of the common juniper (*Juniperus communis*, Linn.), trunks or wood of the pine (*Pinus sylvestris*, Linn., and *P. montana*, Duroi) and the fir (*Abies excelsa*, DC.). Of the yew (*Taxus baccata*, Linn.) bows were made. Of deciduous trees there are, besides the hazel and the beech, the witch-elm, the oak, the lime-tree (much bast), the holly, and the dogwood.

Of aquatic plants, the seeds of *Scirpus lacustris*, *Ceratophyllum demersum*, *Potamogeton*, *Polygonum hydropiper*, *Galium*, *Pedicularis*, *Menyanthes*, *Nymphæa alba*, *Nuphar luteum*, and *N. pumilum* are found in great abundance.—*Bibl. Univ.* Oct. 1864, p. 160.

#### *On some Norwegian Crustacea.* By M. G. O. SARS.

M. Sars has made some curious observations on the persistence in the Scandinavian lakes of certain marine Entomostraca of the glacial epoch. *Harpacticus chelifera* was found in a freshwater lake in the neighbourhood of Christiansund. In the Mjæsen lake (the largest in Norway) he discovered two species of *Cythere*, *Mysis relicta*, Lovén, and *Gammarus cancelloides*, Gerstfeldt; the two latter species were also found by Lovén in the Swedish lakes. In ponds of the environs of Christiania the Amphipod *Pontoporeia affinis* was discovered. These species all inhabit the deepest parts of the water, and live quite separate from the true freshwater forms of Crustacea. M. Sars considers the presence of these Crustacea in the Scandinavian lakes to furnish evidence that at the glacial epoch the basin of the Baltic was in communication with either the eastern or western Arctic ocean.—*Bibl. Univ.* Sept. 20, 1864, *Bull. Sci.* p. 84.





Heer, O. 1864. "On the remains of plants found beneath the Swiss lake-dwellings." *The Annals and magazine of natural history; zoology, botany, and geology* 14, 465–467.

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