

--was watered on the Farm. The result of the experiments was as shown below:—

Average yield per tree.

Year.	II-Cultivated.	III-Uncultivated.	IV-Cultivated.
1918	17.59 nuts.	17.52 nuts.	22.94 nuts.
1919	34.56 nuts.	16.13 nuts.	30.01 nuts.
1920	37.50 nuts.	10.15 nuts.	51.31 nuts.

The condition of the trees in the uncultivated plots is as expected very unsatisfactory, except perhaps in the case of those bordering on the cultivated plots and whose roots were partly benefited by the operations done in them, whereas all the trees in the test plots are in a flourishing condition. Before the acquisition of the garden, it had never been dug or ploughed, but the trees had been copiously watered even though most of them were over 20 years old. The net extra income due to the cultivation works out at Rs. 55/- per acre, reckoning at the rate of 60 trees to an acre, whereas the average number per acre in the district is more than 100.

Lessons in Nature Study.

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Water plants—(Contd.).

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Aponogeton monostachyon. A common plant of wide occurrence growing in tanks and ponds and more generally in shallow water. There is a tuberous root-stock sunk in mud and of the several leaves the lower are submerged and the upper ones are floating. The latter are of an oblong shape with considerable variations in size and the leaf stalks also vary much in length according to the depth of water. The flowers are small and pink (rarely white) and crowded into spikes which are raised conspicuously above the surface of water. There are two sepals and six stamens and the ovary is composed of three parts.

The root stock is said to be edible.

Potamogeton indicus. This aquatic presents a striking appearance on account of its branched leafy shoots which float on water sometimes covering a wide area. Most of the leaves are floating and a few are submerged with blades longer than the stalks. The shape of the floating leaf varies from oblong to elliptic lanceolate and at the base of each leaf there is an extra outgrowth, the stipule. The spikes are dense flowered and appear completely above water.

Cyperus. The plants included in the Cyperus family (Cyperaceæ) are generally known by the name of sedges to distinguish them from grasses and some species or other are sure to be found in marshy areas. Very few of them are truly aquatic, but as there are several which cover wide areas of marsh land a knowledge of them will be very desirable. Some of the species are economically useful as they yield material for the manufacture of mats in certain parts of the Presidency, e. g. Tinnevely, Vellore.

The following special features may be noted about the plants:—

- i. A perennating underground system of rhizomes which is responsible for the gregarious habit of the plants.
- ii. Leaves narrow and linear.
- iii. Flowering axis angular.
- vi. Flowers small and inconspicuous crowded so as to form short spikes a large number of which are to be found on a branched axis surrounded by leaves at the top of the flowering shoot.

An interesting line of work will be to form a systematic collection of all the sedges that are found in the locality not only in the marshes but also in paddy lands, dry grounds and waste places and also to draw pupils' attention to such of the plants as are known to be useful.

Panicum interruptum.—

Hygrophiza aristata.— These two plants belong to the order of grasses (Gramineae) and there are a few other members of the family which are typically aquatic in habit or live under marsh conditions. Among these are *Panicum stagninum* and *Leersia hexandra*. In all of them the pupils should know the exact habit of the

plant and the principal features of the grasses as they could be made out in the specimen e. g. the alternate simple leaves with sheathing leaf bases and free lamina, the ligule present at the collar, the roughness of the leaves due to silica and the arrangement of the flower-containing parts viz., spikelets on the flowering axis. Note the erect or creeping nature of the stems and their rooting at the nodes.

Marsilea. Readers of Tamil literature may probably know the interesting passage-at-arms that is said to have taken place between the renowned Auvai and Ottakuthan in which the latter presented for solution by the former a riddle* the substance of which is "A single post it has, a four leaved tent." Auvai, the poetess, scorned it with delight and mentioned the name of the plant which is Aarai in Tamil. This little story points to the possible antiquity of the plant on the Indian soil.

This plant is a very common weed found either submerged or emerged in paddy lands, in the slow moving water of channels or on the edges of tanks and lakes. The slender stem creeps in the mud beneath and bears leaves at the nodes and roots on the lower side both at nodes and inter-nodes. The leaf stalks are long sometimes reaching even 2—3 feet in response to the depth of water and bear 4-lobed lamina which either float or stand erect above water. The leaves are said to sleep at night.

Unlike the plants previously noted *Marsilea* is a flowerless plant (cryptogam) and belongs to the family of Water Ferns. It spreads vegetatively by means of underground stems and in the dry season produces small bean-shaped bodies known as 'sporocarps'. These contain minute spores which on liberation from the sacs which contain them germinate and give rise to special bodies by the union of which fresh plants are formed. As the process is complicated the exact details need not be described.

The plant is sometimes a bad weed when occurring in paddy lands and channels and its eradication is rendered difficult owing to its persistent underground system.

* ஒரு காலடி நாலிலைப்பந்தலடி.

Azolla. Like *Marsilea* this is also a genus of plants belonging to the family of Water Ferns and is of wide distribution in South India. It is a free floating aquatic of dull appearance and may be seen covering wide areas in tanks and ponds sometimes so densely that the water is scarcely visible. Leaves are small and lobed and the roots hang freely in the water from underneath. Small fruit-like bodies (sporocarps) of a reddish colour are to be seen on the lower surface and these contain spores which germinate and give rise to the male and female elements by the union of which new individuals are produced.

The presence of *Azolla* in tanks is said to prevent mosquitoes laying eggs in water and also the larvae from coming to the surface for breathing.

Chara. This aquatic is familiar under the name of 'Sangilipasi' and occurs in tanks and ponds attached to the bottom and forming a dense mass of vegetation. The plants are rough and brittle due to an abundant deposit of silica on them and it is said that their presence makes the water sweet.

The stems are joined and cylindrical and branches arise in whorls from each node. Bright red bodies containing the germs of the plant may be seen in the axils of the branches and these make them very conspicuous in water.

The plant multiplies rapidly by vegetative means and is considered a noxious weed wherever it occurs.

Spirogyra. A common inhabitant of fresh water belonging to the group of plants known as the 'algae.' It forms floating green masses in ponds and shallow water and may be recognised by its sliminess and dark green appearance. It consists of extremely thin and delicate filaments which will show beautiful structures under the microscope.

(To be continued.)
