

April we find the following record of some large trees growing in Indiana :

Chestnut.—In Jackson county are to be found the largest chestnut trees in the State. They are veritable giants, located about three miles southeast of Seymour. One of these measures 22 feet in circumference, two feet above the ground. The height to the first limb is about 70 feet.

Sassafras.—The *Sassafras* attains a remarkable size on the Lower Wabash. One of these, one mile and a half west of Springfield, the old county seat of Posey, is full three feet in diameter, and for more than 60 feet, clear of limbs and knots. Its height, in full, is 85 feet.

Catalpa.—In this same region and along the Wabash, the *Catalpa* grows tall and slender, and in great abundance. It is used for both fence rails and posts, especially for the latter, and for durability stands next to black locust.

Sycamore.—The giant tree of Indiana in all probability, is a *Sycamore* in the White river bottom, not far from Worthington. It is said to be 48 feet in circumference, and has a solid trunk. At a height of 25 feet it branches into three or four limbs, one of which must be more than five feet in diameter. The tree is not quite round, but is still quite regular.

A NATURAL BOTANIC GARDEN.—I do not believe that any college grounds in the country, of equal extent, can surpass those of Wabash College, Indiana, in the display of native plants. A large class began active operations in the botanical laboratory as soon as the first flowers came. They have worked unremittingly ever since, some of them several hours a day ; but the grounds are far from being exhausted, even of the simpler phænogamous plants. The plants are well distributed through the families and we need no better garden for our work than the one growing without care under our feet. All the *Hydrophyllums* are there, and *Phacelias*, *Scilla*, three or four *Trilliums*, five or six species of *Ranunculus*, several *Violets*, *Geraniums*, *Erythroniums*, *Isopyrum*, *Stylophorum*, the early *Composites*, and so on till we could make a very respectable list of spring flowers.—J. M. C.

SOME PLANTS OF FRANKLIN CO., KY.—*Ptelea trifoliata*, L., is rare, but one specimen having been seen. *Rhamnus lanceolatus*, Pursh, is common along the limestone cliffs. *Polygala Senega*, L., var. *latifolia*, T. & G., is the only representative of this genus which I have met with, and it is common.

Medicago lupulina, L., is well established in many places along road sides.

Vicia Caroliniana, Walt., was met with only once in rich limestone soil.

Phaseolus diversifolius, Pers., is rare on dry hillsides.

Desmanthus brachylobus, Benth., was only found growing in cultivated grounds. Two species of *Spiræa* were met with, viz : *S.*

opulifolia, L., and *S. Aruncus*, L., both quite plentiful on the river cliffs.

A small patch of *Epilobium palustre*, L., var *lineare*, was found on the banks of the Kentucky River. *Opuntia Rafinesquii*, Engelm., grows quite abundantly on some dry hillsides. *Passiflora lutea*, L., and *P. incarnata*, L., are both found, the latter rare. *Polytania Nuttallii*, DC., is not uncommon on rich hillsides. *Conioselinum Canadense*, T. & G., *Thaspium barbinode*, Nutt., *T. trifoliatum*, var. *atropurpureum*, T. & G., *Zizia integerrima*, DC., *Bupleurum rotundifolium*, L., *Osmorrhiza brevistylis*, DC., and *Erigenia bulbosa* are all found along the base of the cliffs in shaded situations—the latter two rare.

Symphoricarpus vulgaris, Mx., bids fair to become a troublesome shrub in pasture lands. *Lonicera flava*, Sim, is not uncommon on the cliffs of Kentucky River.

Valeriana pauciflora, Mx., is found sparingly in rich soils along the base of the cliffs.

Dipsacus sylvestris, Mill., grows along every roadside, and is becoming a troublesome weed.

Eupatorium incarnatum, Walt., (not noted by Gray this far north) grows quite plentifully on the rich Kentucky River hillsides. The flowers have the delightful odor of the cultivated Heliotrope.

Conoclinium caelestinum, DC., is abundant in damp places. I notice that it produces subterranean runners; that the peduncles have several scattered awl-shaped bracts and that the stem is minutely rosy-hued.

Aster macrophyllus, L., *A. simplex*, Willd., *A. tenuifolius*, L., and *A. Novæ-Angliæ*, L., are only sparingly found.

Bellis integrifolia, Mx., is quite abundant on damp, shady hillsides. In similar situations are found *Polymnia Canadensis*, L., and *P. Uvedalia*.

Dodecatheon Meadia, L., is abundant, but I have only seen one plant with rose-colored corollas, pure white being the usual color seen here. *Bignonia capreolata*, L., is plentiful on the cliffs, but I have never found it in flower or fruit. It retains its leaves all winter, though they change to a dull reddish color. *Conopholis Americana*, Wallroth, I found but once, and then growing certainly on Beech roots.—R. H. WILDBERGER, *Kentucky Mil. Inst., Farmdale, Ky.*

NOTES FROM ILLINOIS.—Mr. H. L. Boltwood reports finding in the neighborhood of Ottawa, *Myosurus minimus*, *Anemone Caroliniana*, *Phlox bifida* and *Astragalus Plattensis*, var. *Missouriensis*.

THE ACORNS AND THEIR GERMINATION.—This is the title of a paper published by Dr. Engelmann in the Transactions of the Academy of Science of St. Louis. The author was induced to pay special attention to the subject by learning that the germinating live-oak developed little tubers, well known to the negro children and greedily eaten by them. In this paper he gives the results of his study of the

acorns and oak seedlings, not only of the the live-oak but of many other species. We give the following synopsis :

In the tip of each acorn we distinguish, imbedded between the two large fleshy cotyledons, first, the little caulicle, and then at its upper end (towards the centre of the acorn) the two stalks or petioles of these cotyledons ; between these the plumule is visible, more or less developed, usually only a truncate or slightly notched or emarginate knob. These parts together are in the different species and in different sized acorns usually from one to three lines long and one-half to one line in diameter ; in very small acorns sometimes smaller.

The acorns of all oaks germinate in or on the ground, the thickened stalks and the caulicle elongate ; the former become 2 to 4 or nearly as much as 6 lines long, while the cotyledons themselves remain enclosed in the cracked seedshell, and from between the bases of the stalks the plumule grows up into the ascending axis, nourished by the food contained in the cotyledons ; these become exhausted and rot away about the end of the first season, while the radicle about the same time swells up, evidently absorbing part of the matter contained in them and thus laying up a store of food for the next season.

The process in *Q. virens* is essentially the same ; it differs somewhat in that the connate stalk of the cotyledons remains more slender, but elongates more, mostly to the extent of one inch or even more ; the caulicle and upper part of the root swells up at once, while the developing plumule forces its way up through a slit in the base of the stalk. It seems that the danger of losing connection with the storehouse of the cotyledonous mass through the long and slender passage of the stalk, necessitates the transfer of the food-matter to a nearer and safer place of deposit. But why, it may be asked, is the connection so much longer and more slender than in other oaks ? At all events it suffices, as long as it is fresh and unimpaired, to carry over in a very short time the starchy and sweet contents from the cotyledons to the tuber ; and before the ascending axis is an inch high and bears as yet only a few minute bracts, the tuber is already forming and it soon reaches the size of the cotyledons themselves ; it is, however, longer and more slender, of a fusiform shape, about three to four lines thick and one to two inches long, attenuated below into the long tap root.

The whole process is similar to the germination of the cucurbitaceous *Megarrhiza* of California, so beautifully illustrated by Gray in his Structural Botany ; with this difference, that the cotyledons in that plant are raised above the ground, while in ours they remain hypogæous, and that the stalk is even longer, and is, together with the cotyledons, readily separable into its two component parts. In both plants a tuber forms at once by the transfer of the food-matter from the cotyledons to the radicle ; in the herbaceous *Megarrhiza* the tuber becomes a permanent organ of immense size, while in the arborescent live oak it is finally merged in the root.



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