

JUNE, 1910

VOL. XXIV, No. 3

THE OTTAWA NATURALIST

Published by The Ottawa Field-Naturalists' Club.

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VOL. XXIV.

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No. 3

PLANTS GROWING WILD AND WITHOUT CULTIVATION IN THE COUNTY OF LAMBTON, ONTARIO.

BY CHARLES K. DODGE, PORT HURON, MICH.

The County of Lambton is situated at the foot of Lake Huron and east of St. Clair River, having about 40 miles of Lake Huron shore and about the same amount of St. Clair River shore, and extending east from the river over 30 miles. One fact not generally known is that on the south it includes the Delta Islands of St. Clair River, belonging to Ontario, and lying immediately west of the northern part of Kent County, the largest being Walpole Island, Squirrel Island and St. Ann's Island. These islands include a number of miles of Lake St. Clair shore. The surface of Lambton County is generally low and level, there being very few hills and very little rolling land. The small rivers and creeks especially in the eastern part are often sunk below the general surface and have narrow flood valleys. The mouths of those flowing northerly into Lake Huron are usually closed during the dry seasons of summer with gravel and sand thrown up by wave and wind. The Aux Sables River, the largest of the small streams, and entering the county at the north-east, appears to flow continuously, but its sinuous course and the large number of its old and abandoned stream beds show conclusively that its course to Lake Huron has often been obstructed and changed. Many small streams flow southerly into Lake St. Clair. Outcroppings appear at Kettle Point, Rock Glen and a few other places, exposing fossil-bearing rocks of great interest to geologists. The Delta Islands of St. Clair River without doubt were mostly formed by the deposit of material carried down by the river into Lake St. Clair, and it has been estimated that about one-fourth of the original area of the lake has thus been filled up.* On the north shore bordering on the lower ends of these islands, the water for some distance is very shallow and the adjacent land recently made very wet and boggy. Parts away from shore are prairie-like, usually very wet in spring and fall, but very

*See report of Leon J. Cole on "The Delta Islands of St. Clair River." Geological Survey of Michigan, Vol. IX, Part I.

dry and spongy in summer and covered mostly with sedges and grasses. Sandy spots and a few low sand ridges are noticed at the upper ends. Tamarack swamps, marshy and boggy places, ponds and shallow lakes, are noticed in various parts of the county, but these have been greatly modified and have partially disappeared in recent years on account of drainage and fires. Along the Lake Huron shore for nearly the whole distance from Point Edward to the north-east limit of the county are sand hills and sand ridges, known also as sand dunes, usually parallel with the shore, ranging from a few to nearly 100 feet in height and extending back from a few rods to a mile. For a short distance near Camlachie and Kettle Point, the latter place famous for its peculiar rock formation, sand ridges for the most part disappear and flat and naturally wet land covered with the prevailing forest of the county runs down to the shore. These dunes are pure sand and owe their origin exclusively to local conditions and the combined action of waves and wind. They are not so extensive as on the west coast of Michigan and not very prominent here except at and near Port Franks, where a vast amount of sand has been piled up and ridge succeeds ridge for a mile back from shore. Most of them are fixed, being covered with trees, shrubs and herbaceous plants that substantially hold the sand in place. Near the lake, especially at Port Franks, the dunes are still forming and being blown first one way and then another, but nowhere, so far as observed, are they encroaching upon good agricultural land. The lake shore of the county running quite uniformly north-east and south-west, the question naturally arises as to why the dunes are so much more prominent and massive at Port Franks than at any other point. On the west coast of Michigan it has been noticed that the largest dunes have been formed at the mouths of rivers.* This, perhaps, fully explains the situation at Port Franks. At this point the Aux Sables River enters the lake, brings down and carries into it immense amounts of sand, which is again washed up by waves and then blown up into dunes.

From the foregoing it will be seen that the district under consideration may be conveniently divided into three plant habitats: 1, Hydrophytic, the very wet; 2, Mesophytic, the medium wet; 3, Xerophytic, the very dry.

HYDROPHYTIC.

This includes lakes, rivers, creeks, parts of their shores, ponds and bogs. From the favorable situation of the locality

*The Ecological Relations of the Vegetation on the Sand Dunes of Lake Michigan, by Henry Chandler Cowles. Botanical Gazette, Vol. XXVII, Nos. 2, 3, 4 and 5.

this habitat is very interesting. On the border of Lake St. Clair, along the several mouths of St. Clair River and on the Delta Islands are bogs, coves, small bays and large areas of shallow and apparently stagnant and still water. These are the homes of the pondweeds (Potamogetons), no less than 27 species or forms having been noticed. In many places on the borders of Lake St. Clair and the mouths of St. Clair River, and extending out some distance into the water, the rush, *Scirpus occidentalis*, is so dense that it is difficult to row a small boat through it. With it will often be found an abundance of *Equisetum fluviatile*. Nearer the shore, sometimes however in shallow water, or in very wet places, *Scirpus validus*, *S. heterochaetus*, *Sparganium eurycarpum* and *Bidens beckii* are abundant. In coves and still water the pickerel-weed, *Najas flexilis*, water shield, *Nymphaea advena*, and *Castalia tuberosa*, are very frequent, and *Eleocharis quadrangulata*, occasional. In very wet places, and often as it appears in the beds of old but now mostly discontinued streams, the reed, *Phragmites communis*, is abundant and very striking in appearance when in bloom. The renowned Indian rice, *Zizania aquatica* and *Vallisneria spiralis*, known among sportsmen as wild celery, and both said to furnish much food for ducks, are found, the former plentiful in spots, the latter common everywhere. Another plant, *Sagittaria latifolia*, whose root or rootstock is said to furnish food for ducks and swan, and sometimes known as swan-root, is common in mud and shallow water. The advent of the white man is gradually bringing about permanent changes among both our wild animals and plants. Notwithstanding the modern humane laws for the protection of game, and the fact that it is naturally one of the finest feeding grounds, the number of water birds now visiting the once famous shooting grounds of the "St. Clair Flats" has much diminished in comparison with former times. Proximity of cities and dense populations also tend greatly to destroy all wild plants with beautiful flowers. About twenty years ago, Sarnia Bay, a piece of still water lying on the east side of St. Clair River between the cities of Sarnia, Ontario, and Port Huron, Michigan, was noted for its great abundance of the white water lily, *Castalia tuberosa*. Constant gathering by the people of both cities and the closing up of the bay by lumber companies, has about extinguished it. North-east of Sarnia, but a few years ago, there were large tamarack swamps, and a few smaller ones were noticed in other localities. Since then a complete change has taken place. A few trees only skirt the borders of the few swamps now left. Some fine meadows, cultivated fields of corn, other grains, and sometimes celery, have taken their places. Formerly on the borders of these swamps and among the trees, the pitcher plant was

abundant, *Cypripedium parviflorum*, and the beautiful species *C. hirsutum* (*C. spectabile*), common and *Pogonia ophioglossoides* and *Calopogon pulchellus*, frequent. At Port Franks, on the borders of old river beds, long ago abandoned by the Aux Sables River, the pitcher plant still exists, and in wet boggy spots the buckbean is abundant.

MESOPHYTIC.

In this habitat may be included by far the largest part of this region. Perhaps less than seventy years ago Lambton County was covered with an almost impenetrable forest. At that time conditions were such that it retained for nearly the whole summer season large amounts of water received in the form of rain and snow. The small rivers and creeks, being more or less clogged with rubbish, drained the surface very slowly and the forest was then known as "wet woods." Since that time a radical change has taken place. At present the whole region is fairly well drained, and most of the timber cut, there being left here and there "wood lots," partially showing former conditions, although generally very heavily pastured. The Indian reservations near Kettle Point, below Sarnia and on the Delta Islands, having undergone a less radical change, although parts are fairly cultivated, show and prove better than any other localities what the original vegetation was. From an examination of woods near Sarnia, Port Franks, Rock Glen, Wyoming, Watford, Alvinston and the Indian reservations, especially on the Delta Islands, these several places extending fairly well over the county, it appears that the original tree growth was as follows in order of abundance: American elm, black ash, white ash, red maple, basswood, beech, sugar maple, ironwood (*Ostrya virginiana*), blue beech (*Carpinus caroliniana*), silver maple, *Crataegus punctata*, red oak, bur oak, cottonwood, yellow birch, shagbark hickory, butternut, sycamore, peach-leaved willow, red ash, rock elm and slippery elm. Pin oak is the dominant tree on the Delta Islands in spots and here or perhaps in parts of Kent County reaches its northern limit. One large tree of the mocker nut hickory was noticed on Squirrel Island, probably its extreme northern limit for this region. In such wet forests the species of plant undergrowth are not very numerous. Among others were noticed the spice bush, moose-wood, red-berried elder, lizard's tail, jack-in-the-pulpit, wild leek (formerly very abundant), wild garlic, ground nut (*Panax trifolium*), spikenard, wild sarsaparilla, *Circaea alpina*, wood nettle, *Cardamine douglassii*, *Claytonia virginica*. Much of the prairie-like land of the Delta Islands naturally falls within this division. Hundreds of acres there are covered with *Habenaria leucophaea*,

Liatrix spicata, a beautiful plant in bloom, Indian grass, *Gerardia paupercula* and *Spartina michauxiana*. In spots are found *Asclepias sullivantii*, *Tradescantia reflexa*, *Viola sagittata*, *Vernonia missurica*, *Polygala incarnata*, *Panicum virgatum*, *Aster multiflorus*, and *Cyripedium candidum*.

XEROPHYTIC.

This plant habitat covers the sandy portion of Lake Huron shore, sand dunes, sand hills, sand ridges, flat, dry and sandy land, and all dry and sterile ground. The Lake Huron beach included under this division may be regarded as that part of the sandy shore frequently washed by waves. This part has a very sparse vegetation, plants peculiar to itself and not equally distributed. *Cakile edentula* is seldom abundant, but fairly well distributed, and often near the water. *Euphorbia polygonifolia* is abundant in spots and often in the drifting sand of the beach. *Artemisia caudata* is frequent, but this is also found on the dunes. One plant of the beach, perhaps deserving particular notice, is *Cirsium pitcheri*, a thistle known only, I believe, along the Great Lakes, and named for Dr. Zina Pitcher, an army physician stationed more than sixty years ago at Fort Gratiot, Michigan, now a part of the City of Port Huron. This plant, common at Port Franks, loves the wave-washed shore, and often creeps up the first shoreward dune, but very seldom beyond. *Ammophila arenaria* and *Calamovilfa longifolia*, two grasses often found in abundance on the beach, are true and efficient sand binders, both having a root or rootstock system which very effectually protects the sand from the action of wind and waves. The former is usually nearer the water, the latter farther up on the beach, but both are also noticed on dunes. So well adapted are these two grasses for holding down and binding the drifting sands or shores that governments in Europe and America have much encouraged their planting to protect sea coasts and to prevent the sand from encroaching upon good agricultural land. The beach pea also frequent at Port Franks is another strong sand binder and has been known to extend its rootstock in sand over nine feet horizontally. These three plants are said to be abundant in many places on the Atlantic shores. *Juncus balticus littoralis* frequently establishes itself as a strong sand binder, but is also found in other localities. The sandy beach and sand dunes are the least productive of any part of the county, at present the dunes being useful only for timber growth and a small amount of pasturage. Generally only such plants grow on the dunes as are adapted to dry sandy conditions. Here vegetation has not been much changed and hence is fairly primitive. Only those plants thrive there that can best endure the hard conditions

imposed upon them and have developed special powers of resistance. On account of these special modifications to fit the environment, the plants of the sand dunes are of great interest to the botanist and worthy of much study. The dune plant covering varies in many respects from point to point. Immediately east of Point Edward the dominant trees are white oak, yellow-barked oak (*Quercus velutina*), and red oak. Balsam poplar is often abundant on the dune nearest the lake, and is a good sand binder. Bur oak usually occupies rich ground, but here it is frequent on the shoreward dune and acts as a good sand binder and dune builder. In this situation, however, it is generally small and scraggy, often having its trunk buried several feet in the sand, but usually producing a great abundance of acorns. White pine and sassafras are also frequent. The common smaller trees and shrubs are the choke cherry, witch-hazel, *Rhus typhina*, *R. canadensis*, *R. toxicodendron*, *Amelanchier spicata*, black huckleberry, low sweet blueberry, and in spots, *Ceanothus ovatus*, bearberry, *Ceanothus americanus*, *Symphoricarpos racemosus pauciflorus*, *Rosa humilis*, sand cherry, *Vitis vulpina*, dewberry, and *Amelanchier oblongifolia*. On the upper beach near many of the summer cottages and along the first dune, *Salix purpurea* has been planted, thrives and is proving to be a strong sand binder. The prevailing herbaceous plants, many of them plentiful in spots, are *Sporobolus cryptandrus*, *Elymus canadensis*, *Agropyron dasystachyum*, *Bromus kalmii*, porcupine grass, *Lithospermum gmelini*, *L. angustifolium*, *Arabis lyrata*, *Liatris scariosa*, *L. cylindracea*, *Viola pubescens*, *V. fimbriatula*, *V. pedata lineariloba*, *Senecio balsamitae*, *Campanula rotundifolia*, *Helianthus divaricatus*, *Linum virginianum*, *Desmodium rotundifolium*, *Lespedeza capitata*, *L. frutescens*, *Acerates viridiflora lanceolata*, *Polygonum tenue*, *Draba caroliniana*, wild lupine, *Aster azureus*, *Lilium philadelphicum andinum*, *Asclepias syriaca* and *A. tuberosa*. Farther to the north-east beyond Kettle Point and toward Port Franks, the change in plant associations is very apparent. The shoreward dunes are still active and the fixed ones much larger and higher. Here the Norway pine (red pine), is well established and abundant reaching its southern limit for this locality. The white pine is more common, and near Thedford, formerly covered thickly, several large pieces of flat sandy land, as the remaining stumps now prove. *Juniperus communis* and red cedar become common. Two new oaks appear, *Quercus muhlenbergii* and *Q. prinoides*, not noticed elsewhere. *Q. coccinea* is occasional. *Celtis occidentalis pumila* is very common, and Rev. Mr. Currie, of Thedford, reports having seen one or two specimens of the species near there. *Salix glaucophylla* is abundant on the upper beach and dunes and is a substantial sand binder.

Shepherdia canadensis is also very abundant in spots. Many herbaceous plants, a few not seen elsewhere, find a congenial home here. On the shaded sides of high dunes are *Oryzopsis racemosa* and *Carexburnea* and on the drifting shore and dunes, bugseed in abundance. In spots *Buchnera americana*, *Aster ptarmicoides* and *Viola arenaria* are frequent. In a few places on the Delta Islands, xerophytic conditions prevail. Within a small area on Squirrel Island the following association of plants was observed: *Liatris scariosa*, *Hieracium longipilum*, butterfly-weed, wild lupine, *Lespedeza capitata*, *Ceanothus americanus*, *Gentiana linearis*, *Bucknera americana* and *Andropogon scoparius*.

Without particular reference to habitat and divisions given above, some localities are noted for the appearance of one or more species seldom seen or not noticed elsewhere. At the north end of Walpole Island the scarlet painted cup and *Cerastium arvense oblongifolium* are abundant, the latter not noticed elsewhere. About the middle of the north half of the same island, several spots are thickly covered with *Silphium terebinthinaceum*, long ago reported by Prof. John Macoun, this, very probably, being its northern limit for our locality. On the bank of the Aux Sables River Mr. Newton Tripp, of Forest, found *Cacalia tuberosa* and *Astragalus neglectus*, both rare for this region. In and about a large pond north of Sarnia, *Utricularia resupinata* is abundant.

It is perhaps not best to go into the well known methods of plant distribution by means of seeds, and the various ways in which they are brought from one country to another, yet it is interesting to notice the great changes taking place in a comparatively new country. At Point Edward, where the Grand Trunk Railway formerly crossed into Michigan, the following introduced plants have been well established for a number of years in the streets and waste places: *Datura stramonium*, *D. tatula*, *Ambrosia psilostachya*, *Amaranthus blitoides*, Russian thistle, catnip, *Solanum carolinense*, *Euphorbia lucida*, *Artemisia vulgaris*, *A. pontica* L., *Echium vulgare*, *Ribes aureum*, matrimony vine, *Linaria vulgaris*, *L. minor*, *Verbena stricta*, *V. bracteosa*, *Cycloloma atriplicifolium*, *Chenopodium botrys*, *Erysimum parviflorum*, *Thlaspi arvense*, *Bromus brizaeformis*, *B. tectorum*, *Sisymbrium altissimum*, *Petalostemum purpureum* and others.

It is very natural for an observer in looking backward to contrast conditions existing before the advent of Europeans with those of the present time. The great change that has been going on from time to time in various parts of North America for 200 years and more, from a state of nature to one of civilization has occurred here in recent years. From an almost impassable forest, the country has been changed by the activity

and persistence of white men to one of the best agricultural districts. The soil is usually clay or clay loam and has been recovered by clearing and a fairly good system of drainage. The splendid farm buildings throughout and the prosperous appearance of villages and towns show activity, thrift and success. A few localities have become noted for apples and other fruits. Some of the finest apple orchards the writer has ever seen were noticed east of Arkona. The position of the county as to water front is unusually good. This, no doubt, as it becomes more and more appreciated, will induce hundreds of people to build cottages for summer residence on both lake and river shores. In fact, this is already actively going on. To an outside observer the suggestion is irresistible that the sand dunes at and near Port Franks would make a fine Government reservation which could be easily reached by electric railways from large cities.

The scientific names above used are according to Gray's New Manual of Botany. Where this work gave no common names, these were taken from Britton and Brown's Illustrated Flora and Britton's Manual. In writing specific scientific names, capital letters have in all cases been purposely omitted.

CANADIAN SPECIES OF THALICTRUM.—IV.

BY EDWARD L. GREENE.

Continuing our study of the white-flowered meadow-rues indigenous to Canada, a group of species which, if one regarded nothing else but their stout white stamens, might be thrown together as all one—as these had been for a hundred years formerly as *T. Cornuti*, later as *T. polygamum*—we take up next after *T. zibellinum* of Sable Island, two others which, so far as known, are of Newfoundland and Labrador.

THALICTRUM TERRAE NOVAE.—Stems neither stout nor strongly angled or striate, glabrous throughout, copiously leafy and very few-flowered, 2 feet high or more; basal leaves not seen, the several cauline sessile, ample, deep-green above, glaucescent beneath, all except the uppermost glabrous, but these with a trace of scattered hairs beneath; terminal leaflets somewhat round-obovate, $1\frac{1}{4}$ to $1\frac{1}{2}$ inches long, of nearly equal breadth above the middle, not deeply but very obtusely 3-lobed, the medium lobe in the staminate plant much the largest, itself usually 3-lobed (seldom so in the fertile plant), all lobes broader than long, the leaflet as a whole always obtuse at base unless obliquely cordate; lateral leaflets smaller, narrower in proportion, mostly either 3-lobed or 2-lobed, a few obliquely oval and

entire; staminate plants with flowers usually only 5 or 6 in a single terminal cyme; sepals 4, obovate, obtuse, glabrous; stamens about 20; filaments slenderly clavellate, the thickest part not as wide as the short merely oval anthers; fertile plant bearing a small terminal panicle of 10 to 14 flowers, these with a few stamens and numerous pistils; fruit not seen.

Vicinity of Balena, Hermitage Bay, Newfoundland, along streams, collected by William Palmer, 7 July, 1903; his No. 1398, as in U. S. Herb.; also on rocky banks of Rennie's River, by Robinson and Schrenck, 4 Aug., 1894; their No. 187, as in U. S. Herb. and Canad. Geol. Survey.

THALICTRUM LABRADORICUM. Stems not tall, stout, hollow, striate-angled, glabrous, or the upper part sparingly hirtellous; foliage thin and delicate, that of the lower part of the plant glabrous on both faces, but the upper leaves glabrous above, sparsely pubescent beneath between the veins, not along them; terminal leaflets rarely cuneately, usually subquadrately somewhat obovate, about 1 inch long, $\frac{3}{4}$ -inch wide just below the lobes, obtuse or subcordate at base, the 3-lobes neither decidedly obtuse nor very plainly acute, the middle one largest, often itself 3-lobed; flowers few, in one or two simple, corymbs of 3 or 4, or even solitary; the staminate very large, $\frac{1}{2}$ -inch in diameter, the stamens in no part capillary, their filaments clavellate at most from the base and little thicker even at summit, their greatest breadth not exceeding that of the anthers, these oblong-linear, obscurely mucronulate; fertile flowers with many pistils and usually 6 to 10 stamens; mature carpels gradually narrowed below the middle but sessile, thickest a little below the summit, therefore subclavate being only very slightly flattened, sparsely pubescent both at the flowering stage and at maturity.

Two sheets of specimens of this are before me, one belonging to the U. S. National Herbarium, consisting of two staminate plants and one fruiting one. These were collected in "Labrador" by W. E. Stearns in 1875. The other sheet is No. 4,335 of the Canadian Geol. Survey. This contains the upper portions of four plants, all fertile, the flowers, though hermaphrodite, consisting mainly of pistils. These specimens are from thickets along the Upper West Branch of Hamilton River, Labrador, by A. P. Low, 7 July, 1894. Both sheets had been labelled *T. dioicum*, in either case the result of a mere glance at the plants as small and very few-flowered, without the least attention to the fact that the stamens are all clavate and erect; and, in the living state, they must have been white, and therefore showy.

By the large size and the small number of these white-stamened flowers, the plant seems to recall more vividly than any other North American species the *T. aquilegifolium* of

Europe; and it is not at all impossible that some such plant as this, from far northward, may have been Cornut's original *T. Canadense*, and therefore the original *T. Cornuti* of Linnæus.

THALICTRUM TORTUOSUM. Stout, rigid, evidently tall, doubtless a yard high or near it, the stem angled and striate, also minutely appressed-pubescent, the upper and floriferous part more or less tortuous; basal leaves not seen, the largest cauline one sessile, very large, 8 inches long and 10 in breadth, every petiolule and ramification of it singularly tortuous; terminal leaflets an inch long, nearly as broad, of round-ovate contour, cordate at base, at summit variously but always broadly and not deeply lobed, the median lobe often exceeding the others and itself 3-lobed, as often only broader and entire, all lobes very obtuse; lateral leaflets broadly and very obliquely oval when entire, but some larger and with a lobe or two, all leaflets of firm texture, dark blue-green above and with scattered scaberulous hairs, beneath glaucous and thinly tomentulose; flowers of fertile plants in a rather naked but not large terminal panicle, the flowers 25 to 40, the several stamens with long filaments capillary at base, distinctly clavate above the middle, but nowhere of much more than half the thickness of the anthers, these oblong to oblong-linear, mucronulate; carpels numerous, nearly all maturing, small, sessile, scaberulous, their stigmas closely circinate.

Thickets at Baddeck, Cape Breton Island, Macoun, 28 July, 1898. Only the middle and upper parts of one or two plants were collected, all with mainly pistillate flowers, though with several stamens in each flower; but the species is strongly marked by its petioles and petiolules all of which are as contorted as those of a Clematis, and the texture as well as the indument of the leaflet is of a firmness not known in other meadow-rues of the farther North. The circinate character of the stigmas is striking, but occurs in one or more other species. The specimens bear the number 19,006 of the Geol. Survey.

THALICTRUM GLAUCODEUM. Rather slender, 2 feet high or more, with stem strongly striate-angled and glabrous, simple, leafy up to the small and rather naked panicle; leaves rather small and of many small leaflets, the basal not seen, the lower cauline petiolate, the upper sessile, all of firm texture, glaucous on both faces, but beneath almost white with bloom; terminal leaflets shortly and subquadrately obovate, the largest barely $\frac{3}{4}$ -inch long, $\frac{1}{2}$ -inch wide under the lobes, these 3, shallow, much broader than long, rounded, yet abruptly acutish, the base obtuse or subtruncate, the lateral leaflets not much smaller, mainly not very dissimilar, but a few quite small round-oval and entire, all leaflets marked underneath by a few very pro-

minently raised white veins and a thin indument of short white hairs; panicle of fertile plant small but rather many-flowered and dense, its branches glabrous, as also the calyx; pistils numerous, encircled by a row of 3 to 7 or 8 stamens; filaments abruptly clavate above, but not to the width of the mostly broad and merely oval (occasionally oblong) anthers; immature carpels fusiform, substipitate, glabrous.

The type specimen of this rather elegant and very pale meadow-rue is in the herbarium of the Geol. Survey, under No. 869, and came from Tignish, at the northern extremity of Prince Edward Island, where it was obtained by Professor Macoun, 25 July, 1888. The flowers, though mainly pistillate, are very fairly hermaphrodite.

A plant much like this in habit, quite as pale with bloom, and even with very similar foliage, is in the same herbarium from Boyleston, Nova Scotia, by Dr. Charles A. Hamilton, July, 1890. It also has hermaphrodite flowers, and in these the calyx is persistent and is of five or six narrow elliptical sepals. This plant also I refer tentatively to *T. glaucodeum*, and hope it may prove to belong with the more northerly and insular type.

BIRDS OBSERVED AT SHERBROOKE, QUE.—SPRING MIGRATION, 1909.

BY R. G. PRICE.

Crow.....	Feb. 28,	common.....	S.R.
Robin.....	Mar. 12,	".....	S.R.
Horned Lark.....	" 12,	fairly common (1)...	S.R.?
Bronze Grackle.....	Apr. 5,	common.....	S.R.
Bluebird.....	" 5,	".....	S.R.
Red-tailed Hawk.....	" 5,	becoming rare.....	S.R.
Red-shouldered Hawk....	" 6,	common.....	S.R.
Song Sparrow.....	" 6,	".....	S.R.
Marsh Hawk.....	" 5,	fairly common.....	S.R.
Northern Shrike.....	" 6,	".....	R.
Blue Jay.....	" 6,	common.....	R.
Red Crossbill.....	" 6,	fairly common (2)...	P.M.
White-winged Crossbill...	" 6,	rare.....	P.M.
Pigeon Hawk.....	" 7,	fairly common.....	S.R.
Junco.....	" 7,	".....	P.M.
Meadow Lark.....	" 12,	".....	S.R.
Sparrow Hawk.....	" 12,	".....	S.R.
Golden-eye Duck.....	" 12,	common (3).....	S.R.
Cowbird.....	" 15,	".....	S.R.

Phoebe.....	"	15, fairly common.....	S.R.
Flicker.....	"	21, " ".....	S.R.
Purple Finch.....	"	21, " ".....	S.R.
Bald Eagle.....	"	21, rare.....	S.R.
Osprey.....	"	21, fairly common.....	S.R.
Chipping Sparrow.....	"	29, common.....	S.R.
Field Sparrow.....	"	29, fairly common.....	S.R.
Barn Swallow.....	"	30, common.....	S.R.
Yellow Warbler.....	May	9, fairly common.....	S.R.
Chimney Swift.....	"	10, common.....	S.R.
Chebec.....	"	10, fairly common.....	S.R.
Fox Sparrow.....	"	10, " ".....	P.M.
Winter Wren.....	"	11, " ".....	S.R.
Bank Swallow.....	"	11, common.....	S.R.
Myrtle Warbler.....	"	11, fairly common.....	P.M.
Goldfinch.....	"	12, " ".....	S.R.
American Merganser.....	"	12, rare.....	P.M.
Belted Kingfisher.....	"	12, common.....	S.R.
White-crowned Sparrow..	"	12, " ".....	P.M.
Golden-crowned Kinglet..	"	12, rare.....	P.M.?
Wilson's Thrush.....	"	12, common.....	S.R.
Hermit Thrush.....	"	12, fairly common.....	S.R.
Bobolink.....	"	13, common.....	S.R.
Yellow-bellied Sapsucker..	"	13, fairly common.....	S.R.
Jenny Wren.....	"	14, " ".....	S.R.
Kingbird.....	"	15, common.....	S.R.
White-throated Sparrow..	"	12, " ".....	S.R.
Purple Martin.....	"	14, " ".....	S.R.
Yellow-throated Vireo....	"	16, rare.....	S.R.
Great-crested Flycatcher..	"	16, " ".....	S.R.
Blue Heron.....	"	17, fairly common.....	S.R.
Maryland Yellowthroat...	"	18, " ".....	S.R.
Water Thrush.....	"	18, " ".....	S.R.
Black-sided Blue Warbler..	"	19, " ".....	S.R.
Rose-breasted Grosbeak..	"	19, " ".....	S.R.
Baltimore Oriole.....	"	19, " ".....	S.R.
Bittern.....	"	20, " ".....	S.R.
Sharp-shinned Hawk.....	"	20, " ".....	S.R.
Red-eyed Vireo.....	"	22, common.....	S.R.
Ovenbird.....	"	22, fairly common.....	S.R.
Swamp Sparrow.....	"	26, rare.....	S.R.
Whip-poor-will.....	"	26, fairly common.....	S.R.
Ruby-throated Humming- bird.....	"	28, " ".....	S.R.
Catbird.....	"	28, common.....	S.R.
Cedar Waxwing.....	June	6, fairly common.....	S.R.

Night Hawk.....	June 7, fairly common.....	S. R.
Cuckoo.....	" 14, rare.....	S. R.
Great Horned Owl.....	" 14, ".....	S. R.
Scarlet Tanager.....	" 14, ".....	S. R.
Indigo Bunting.....	" 16, very rare.....	S. R.
Chestnut-sided Warbler...	" 16, fairly common.....	S. R.
Black-capped Warbler....	" 18, rare.....	S. R.
Blackburnian Warbler....	" 18, ".....	S. R.
Parula Warbler.....	20, ".....	S. R.
Barred Owl.....	" 20, common.....	R.
Hairy Woodpecker.....	" 20, fairly common.....	R.

Owing to rather limited time the foregoing observations are very incomplete, neither do they indicate the exact arrival of the birds. Abbreviations used:—P.M., passing migrant; S.R., summer resident; R., resident.

- (1) Have observed only 2 cases of breeding here.
- (2) Some years are quite numerous.
- (3) Breeds on Lakes St. Francis, Magog and Aylmer.

SVALOF SEED FARM.

BY GEO. H. CLARK, SEED COMMISSIONER.

Svalof is the name of a railway station in the south of Sweden. There is scarcely a village there, but there is a hotel that would do credit to most of our Canadian towns. A 5,000 acre seed farm at Svalof forms an attraction to agriculturists, not only from Europe, but from all over the world. There is where Nilsson has worked for 20 years. He is now 54 years of age and is reaping some of the fruits of his labors in the pleasure of having people from all over the world come to Svalof to study his methods.

There is also an agricultural high school at Svalof which would compare favorably, in building and equipments, with the best high schools in the smaller towns throughout Canada. There are 46 of these schools of agriculture distributed throughout Sweden, in a way so that they are conveniently available to the farming population of Sweden, which cultivates an area in all not exceeding 9,000,000 acres of land. Because of these schools of agriculture, the average intelligence of the Swedish farmers is perhaps superior to that of most other countries, and the Swedish farmers make good use of the results of the work done by their experimenters.

The 5,000 acre seed farm at Svalof is officered by a scientific staff of five experts and their assistants, who have a splendid

equipment of buildings and apparatus and about 30 acres of land which are devoted exclusively to plant breeding and seed selection work. This scientific staff works together with a commercial organization which is known as the General Swedish Seed Company. The superior selections of wheat, oats, barley, grasses, rye, potatoes and other crops produced by Nilsson and his staff are increased on the larger areas of land and ultimately sold for seeding by the commercial company.

Sweden is a storm-driven and rust-ridden country. The climatic conditions are not dissimilar to those of the north of Scotland. Prior to 1890, Swedish farmers suffered heavy losses from their grain crops being driven down by storms and badly rusted. Dr. Nilsson conceived the idea of going to those storm-driven and badly rusted fields and selecting individual plants which had shown their ability to resist both the storm and rust and were otherwise of good quality. These individual plants of outstanding merit he calls mutants, or sports that will increase true to type. Such mutants he has found to be produced by natural cross fertilization, which occurs but rarely with wheat, oats and barley. He has found such sports the type of which was not fixed but would continue to vary in a manner quite similar to artificial crosses. The good grain from these individual plants is sown with hand drills in rows about seven inches apart, to correspond as nearly as possible with field conditions, both as to soil and thickness of seeding. Out of the 100 or more plants which were first selected and increased in these single rows, a few of the very best are selected and continued the next year on larger plots. From the larger plots the yield and the milling, feeding or malting qualities are determined and only the very best of the new selections—those which are superior for certain conditions of their soil or climate to any of their older sorts—are increased and handed over to the commercial company.

Formerly the average yield per acre of the cereal crops of Sweden ranked low when compared with the other countries of Europe. During the last three years Sweden has ranked in yield of cereal crops per acre among the first five European countries, which is somewhat remarkable considering her position to the far north. If we are to consider the south of Sweden alone, the yield per acre of her grain crops is second only to that of England. Practically all of the cereal crops now grown in Sweden are traceable to Nilsson and his staff, and in their publications the people of Sweden frankly acknowledge their indebtedness to Nilsson for the advanced condition of their agriculture.

NATURE STUDY.

NOTE.—The following article has been prepared for the NATURALIST by Mr. S. E. Percival, a student at the Ottawa Normal School. It is a straightforward statement of what he himself saw, and as such will commend itself to every naturalist and reader of this magazine.—J. W. G.

A WEASEL'S HOME.

Not long ago the opportunity was afforded me of discovering some very interesting facts concerning the life habits of our rather doubtful friend, the weasel. For the benefit of those who are not already well acquainted with this crafty little animal I shall narrate a few incidents as they were brought to my notice.

On one occasion as we were removing the sheaves from a large mow at a threshing bee, near the village of Burrit's Rapids, we were struck by the frequent appearance of a weasel at widely different points about the barn. The little creature seemed greatly distressed and agitated. The men regarded it with a certain amount of interest and amusement, wondering what in their work was causing the little animal so much of apparent worry and excitement. In a very short time, however, the problem was solved. About half way down in the mow the men opened up some peculiar but luxurious apartments which had evidently been the home of the uneasy weasel. The home was lined throughout with the soft fur of mice. The floor had an extra thick covering and in the centre, evidently to take the place of the modern rug, was neatly spread the skin of our pet kitten which had mysteriously disappeared some days before. This room appeared to be the main living room and was about the size of an ordinary water pail.

From this room a winding passage led into another room which presented a rather ghastly appearance, being strewn with the bodies of dead mice, bones, fur, etc. From this commissariat apartment, as well as from the living room, passages and cross passages extended in all directions horizontally forming quite a perfect system of highways.

The following incidents came under the notice of a friend of mine who reported to me all the details as he saw them:

One day while returning from the fields through a lane he heard, before him, a most distressed and dismal squealing. Approaching cautiously he observed two adult weasels each leading by force one of their incorrigible offspring, while two others came quietly along in the rear. There was evidently some cause for a sudden change of quarters. He was unable to watch them long enough to determine their destination, but knowing as we

do the nature of the most luxurious quarters they must have been forced to leave, we cannot blame the young ones for going so reluctantly from it. Again when we note with what determination the parent weasels persisted in placing their young ones in safety we can here at least find in this ever alert lover of blood so much dreaded by other wild and innocent creatures, at least one characteristic worthy of our admiration.

S. E. PERCIVAL.

EXCURSIONS.

The second excursion of the season was held on the afternoon of Saturday, 23rd April, at Britannia. The day was beautiful, and there was a fairly good attendance of members and their friends. Mr. W. T. Macoun and Mr. Groh were the leaders of the Botanical Branch, Mr. Wilson of the Geological Branch and Mr. Halkett of the Zoological Branch. The observations and addresses at the close of the outing were of a general nature. Mr. H. T. Gussow was called on to speak and made some remarks chiefly on fungi, and Mr. Wilson showed some conglomerates. Toads were seen in their spawning beds, and some of their eggs shown. Among the pools were observed forms such as *Physa* and *Limnaea stagnalis* of pulmonate mollusks; phyllopod; water arachnids; and larvæ of caddis-flies, the tubes of these being made of twigs instead of grains of quartz as were some of those of a species found in the creek at Rockcliffe at the excursion on the previous Saturday.

Those who attended the excursion expressed themselves as having enjoyed the outing thoroughly.

A. H.

On Saturday afternoon, April 30th, the excursion was held to Billings' Bridge and the district south of the Rideau River. Here a very pretty stream winds between high banks, the east side of the ravine being heavily wooded for some distance. The afternoon, although not very promising at first, turned out very fine, and although the attendance was not large all seemed to agree that the excursion was a most enjoyable one.

After having explored the district on all sides the various parties assembled at a beautiful spot on the bank of the stream. The president, Mr. Halkett, showed some Crayfish (*Cambarus*) which he found in the stream and its adjacent pools. At a previous excursion to Britannia he had shown a phyllopod with eggs attached to the abdominal somites and had referred to the way the lobster and the crayfish carry their eggs attached to

their swimmerets; and, as there was among the crayfish shown at Billing's Bridge a female heavily laden with eggs, he was able to verify his previous statement from the living specimen. Mr. Halkett also showed a living Brook Stickleback (*Eucalia inconstans*) which was caught in the stream, also the eggs of a mollusk, presumably *Physa*, embedded in a jelly mass which was attached to a stone. The tiny shells could be seen through the egg membranes.

Mr. Groh exhibited one of the first Amelanchiers (June berries) of the season taken from a small tree on the bank of the stream near by. The date was considered early as compared with last year when these were found in bloom a month later. He also showed some of the stems of the Climbing Bitter Sweet which, as he pointed out, had become so twisted and coiled as to choke the stems beneath its coils. The White Trillium was found in abundance in one woods near by. Other specimens exhibited were: Bishop's Cap, Squirrel Corn, Baneberry, Red Trillium, a stemless blue violet (probably *V. septentrionalis*) and many others collected on a previous excursion.

Mr. Brown distributed specimens of Beech nuts in various stages of germination and drew attention to the fine flavor of the cotyledons in the first stages of growth, a fact which first came to his notice when but a lad on his way to and from school in a beech country. He also distributed specimens of the Dog's-tooth Violet, showing the first year's growth, which consisted of a single leaf, a small bulb and a shoot penetrating downwards from this bulb, and the second year's growth which consisted of a pair of leaves, a flower and a much larger bulb which had formed several inches below the former small bulb.

Mr. J. W. Gibson referred to the advantages offered by such a locality for the study of geography and especially from the standpoint of river systems and the great work of erosion. Many of the tributaries of this stream may be traced to their beginnings some distance away in the more open country. He also pointed out the effect of the forest trees along the banks of the stream in preventing the erosion of the soil. The various species of trees found in this locality were also mentioned, attention being called especially to the American Yew Tree (*Taxus canadensis*), this being one of the few places about Ottawa where it is found.

Mr. Nichols spoke for the leaders of the geological branch and stated that the rocks exposed in the banks of the brook were of the Utica formation and were composed of black bituminous shale. One layer about three inches thick was much harder than the rest and contained an abundance of graptolites apparently of one species, and also beautifully preserved specimens of a small brachiopod, *Leptobolus insignis*. There were also

some specimens of obscure plant remains seen. Mr. Nichols pointed out a fault in the rock on the opposite side of the brook in view of the audience. The strata on the western side of the fault dips at a considerable angle and gradually becomes nearly horizontal at some distance away, while on the east side the layers are almost undisturbed. Attention was also called to the erosion of the clay beds and soft shale through which the small brook has cut a deep gully.

J. W. G.

BOOK REVIEW.

BIRDS OF NEW YORK, by Elon Howard Eaton: Part I, Introductory Chapters; Water Birds and Game Birds: New York State Museum, Albany, N.Y., Memoir 12.

This sumptuous volume of 390 pages, beautifully printed on the best of paper, has just recently appeared. It is in every way fully up to the high standard of the other excellent Memoirs of the New York State Museum, the authorities of which have done so much to stimulate research in natural history. The economic importance of a study of birds is now widely recognized. Much investigation into their feeding habits has proved beyond doubt that they are extremely important friends of the agriculturist, in fact, of the whole community at large.

At the present time it is stated that there are 411 species of birds which have been recorded as occurring in New York State. The species have been grouped into six classes, viz.: I. Residents, II. Summer residents, III. Transients, IV. Winter visitants, V. Summer visitants, VI. Accidental visitants. In an interesting chapter near the beginning much useful information is given on life zones, as well as charts to illustrate the distribution of the birds which breed in the three life zones of New York. In a chapter on "Increase and Decrease of Species," it is remarked that it is the general testimony of authors that there has been a marked diminution in the bird life of New York State during the past century. The reasons why this is so are clearly set forth and are only too well known. Modern agriculture is responsible for the death of many birds. Telephone and telegraph wires, electric lights, plate glass windows, cats and thoughtless boys, in cities and towns, all add to the danger to many species. "Perhaps the most destructive class are the thoughtless boys who go birds' egging and shooting indiscriminately; also foreigners, mostly Italians, who often kill all kinds of birds for food, as they have been accustomed to do in their native country; and the pot hunters and market gunners, who

exterminate our game without mercy." The author states that on one occasion he picked up 18 swallows which had been killed by a gunner who was returning home from a disappointed duck hunt. Such acts are, of course, "largely the result of thoughtlessness or ignorance, and it is hoped by spreading a knowledge of our native birds, thereby arousing a pride and interest in their welfare, we may overcome a large portion of this wanton destructiveness."

The tables of "Spring Migration: Arrivals," and "New York Birds: Local Lists" will be of much interest to students in Canada, as well as in the United States. 300 pages are devoted to the water birds and game birds. The species are treated of under the sub-headings "Description," "Distinctive marks," "Field marks," "Distribution," "Migrations," "Haunts and habits," "Food," and "Nests and eggs." The Diving Birds are given first attention. These are followed by an account of the Long-winged Swimmers; then, in order, the Tube-nosed Swimmers; the Totipalmate Birds; the Lamellirostral Swimmers; the Herons, etc., the Marsh Birds, the Plover, Snipe, etc.; Gallinaceous Birds, and Pigeons. Altogether 179 species are treated of. Throughout the text many beautiful illustrations from photographs have been incorporated. Those showing nests and eggs are of special merit and interest. At the end of the volume there are 42 full paged magnificent coloured plates, all of which have been drawn by Mr. Louis Agassiz Fuertes, the well known bird artist. For the last ten years Mr. Fuertes has made careful colour notes immediately after the capture of the birds used for illustrations. In this way he has been able to depict, wonderfully well, the different colours of the birds.

This work is a most important addition to the literature of North American ornithology, and will be greatly welcomed by students of birds everywhere. It will be of much interest to Canadian ornithologists on account of so many of the species occurring in our territory. Much credit is due to the author for the preparation of this immensely valuable Memoir, to the artist for his beautiful illustrations, and to the New York State Education Department for the publication of the whole work. Such a Memoir will be a source of authoritative reference for many years to come.

A. G.

CATALOGUE OF NEARCTIC SPIDERS, by Nathan Banks; Smithsonian Institution, United States National Museum, Bulletin 72.

This publication takes the place of the Marx Catalogue, prepared some twenty years ago. The author states that the

catalogue includes a little over 1,300 species. "The largest family is the Theridiidæ with 298 species; the Attidæ is next with 213; two other families, the Lycosidæ and Epeiridæ, have over 100 species in each. Sixteen families have less than 10 species apiece." This work will be a most useful one. Many of the species occur in Canada but comparatively few definite records are available. The publication of this catalogue will undoubtedly lead to more systematic work, and it is to be hoped that entomologists, or others, in Canada, who are interested in spiders, will do their share in working up local species. In the East a fair amount of work has been done in collecting these creatures, but in the West practically all records of captures would be of value.

A. G.

NOTES.

ANOTHER CASE OF NATURAL GRAFTING.—Mr. J. R. Anderson's note in the April number of THE OTTAWA NATURALIST, about an interesting case of natural grafting, prompts me to call attention to a somewhat different case which may be seen by any Ottawa member, when walking down Bank Street to the Glebe. On the west side of the street, between Roseberry and Strathcona Avenues near Patterson's Creek, there is a medium-sized maple, from the base of which a sucker or twin sapling was at one time growing. The "twin" is still there, but no longer as an independent stem. About a foot from the ground it becomes lost in the larger tree, the bark of which has closed completely over it. Several inches higher up, a branch three or four inches in diameter emerges obliquely from the trunk, and is evidently the re-appearance of the lost sapling; though now looking more like a normal branch of the tree. It is several times the diameter of the part below. The latter though making little, if any growth, is still alive; but any contribution which it may make to the life of the branch must be very small in comparison with that derived through the main trunk. Should one of our future naturalists have the good fortune to be present when this tree is cut down, he may be able to extend this note with some interesting information gathered from a study in cross section.

H. GROH.

The Publications Committee beg to announce that the miscellaneous publications, of which mention has been made, (p. 9, April number, 1910), will be available for free distribution to members of the club on June 21st next at 4.30 p.m., in the basement of the Normal School. L. H. NEWMAN, Ch. of Com.

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