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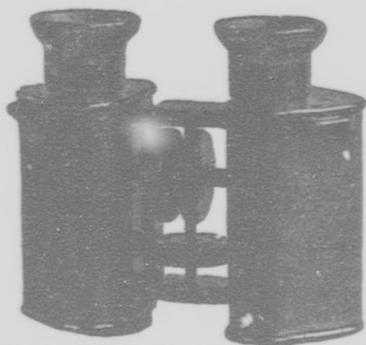
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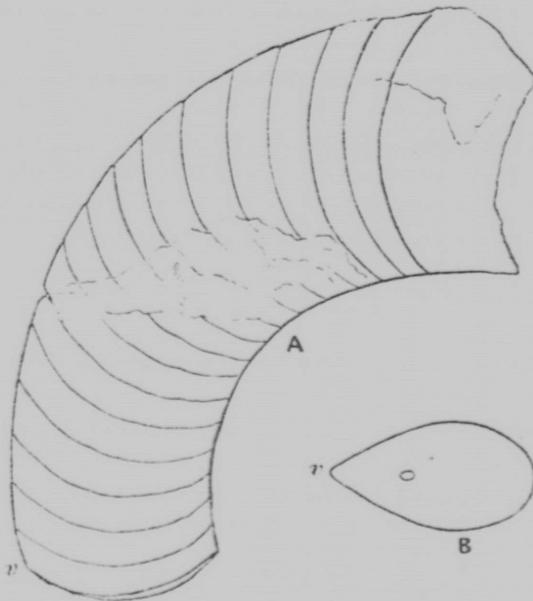
VOL. XX.

OTTAWA, OCTOBER, 1906.

No. 7

NOTES ON CYRTOCERAS CUNEATUM.*

By J. F. WHITEAVES.



Cyrtoceras cuneatum, A. Side view of the type and only known specimen of this species, in outline only. B. Smaller end of the same, also in outline. Both figures are of the natural size, and in both *v* is the venter.

This species was based upon a single specimen from the Silurian rocks at Stonewall, Manitoba, collected by Mr. D. B.

*Communicated by permission of the Director of the Geological Survey Department.

Dowling in 1902, and now in the Geological Survey of Canada. It was described by the writer in the fourth and last part of the third volume of "Palæozoic Fossils," recently published by the Survey, but it was not illustrated, as the type and only known specimen was unfortunately mislaid.

This missing and previously unfigured type has since been found, and it is now practicable to give two illustrations of this interesting specimen, and to slightly amend the original description of the species.

In regard to the two foregoing text figures of *C. cuneatum*, the explanations given below them may be supplemented by the following remarks. The specimen is a cast of the interior of part of the septate portion of the shell, with sixteen of the chambers preserved, and of a small piece apparently at the commencement of the body chamber. Figure A shows both the arcuate contour of the fossil, and the widely and shallowly concave lobe of each of the sutures, as viewed laterally. Figure B, on the other hand, shows the lateral compression, the ovate cuneate transverse section, as seen in an end view of the smaller end of the specimen, the narrow venter, and the apparently eccentric position of the siphuncle.

The original description of the species may be slightly and briefly amended, so as to read as follows:

"Shell widely arcuate, strongly but rather obliquely compressed, very narrow on the periphery or venter, much wider but narrowly rounded on the dorsum, the outline of the transverse section being ovate cuneate, and the lateral diameter to the dorso-ventral about as three to five.

"Septa averaging about six millimetres apart laterally, the sutural lines being shallowly concave on both sides and produced into a narrow pointed saddle on the venter." Test unknown. Shape and position of the siphuncle not very clearly defined in the only specimen collected, though at the smaller end thereof there are indications that it was eccentric and placed a little on the ventral side of the centre, as represented in figure B.

The shell is "evidently not a true *Cyrtoceras*, but a probably new generic type, which there is not yet sufficient material to define satisfactorily."

CONTRIBUTIONS TO CANADIAN BOTANY.*

By JAMES M. MACOUN, Assistant Naturalist, Geological Survey of Canada.

XVII.

Since the last of these papers was published a great many species have been added to the list of those known to occur in Canada; the distribution of others has been greatly extended and a large number of notes worthy of publication have accumulated in our herbarium. Much of this material will be utilized in publications which will be issued from this Department at an early date but it is hoped to print from time to time in THE OTTAWA NATURALIST records that might not find a place elsewhere. Some of these records have appeared in other publications, but as these notes are intended primarily for Canadian workers not all of whom have access to current botanical literature, and in nearly every case new information as to distribution has been added, it has seemed best to make the record as complete as possible by including some matter that has been published elsewhere.

DICKSONIA PILOSIUSCULA, Willd.

In sandy woods, Courtland, Norfolk Co., Ont., 1901.
(*John Macoun.*) Rare in western Ontario.

ASPLENUM RUTA-MURARIA, L.

On limestone rocks, north end of Manitoulin Island, Georgian Bay, Ont. Collected by Dr. Scott of Southampton, in 1901. New to Canada.

ADIANTUM PEDATUM, L., var. ALEUTICUM, Ruprecht.

A. pedatum, Cat. Can. Pl., II: 263 in part.

Represented in our herbarium by four sheets of specimens, all collected on Mt. Albert in the Stickshocks, Gaspé, Que. Two of these sheets were collected by Prof. John Macoun in 1882, and two by Messrs. Collins and Fernald in 1905.

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EQUISETUM LAEVIGATUM, Braun.

Roadsides at Windsor, Ont., 1902. No. 66,396, (*John Macoun.*) Not recorded from eastern Canada.

SPARGANIUM FLUCTUANS, (Morong) Robinson, Rhodora. VII: 60.
S. androcladum, var. *fluctuans*, Cat. Can. Pl., II: 70.

The only Canadian locality cited by Dr. Robinson is Lake Memphremagog, Que. Our specimens are from Campbellton, N.B., No. 28,052*, (*Chalmers*), Lake Mistassini, Que., No. 28,053, (*J. M. Macoun*) and Great Opeongo Lake, Algonquin Park, Ont., No. 22,562. (*John Macoun*). It was reported by J. M. Macoun from Severn River, Keewatin.

PANICUM PHILADELPHICUM, Bernh.

P. capillare, L., var. *flexile*, Gattinger.

P. flexile, (Gatt.) Scribner.

On sand, southern point of Pelee Point, Lake Erie, Ont., July 28. 1892. Referred at the time to *P. capillare*; by marshes, Sarnia, Ont., Herb. No. 26,332, and on Birch Island, Lake Huron, No. 26,331. (*John Macoun.*) Pelee Point, Lake Erie, Sept. 7th, 1905, growing among *Juniperus Virginiana*. (*A. B. Klugh.*)

TRISTEUM MELICOIDEUM, (Mx.) Vasey.

Graphephorum melicoides, Cat. Can. Plants II: 228 in part.

Woodstock, N.B., No. 22,687; Madeline River, Gaspé, Que., No. 29,481. (*John Macoun.*) Aroostook River, N.B. (*Williams, Collins and Fernald.*) Ste. Anne des Monts River, Gaspé, Que. (*O. D. Allen.*)

TRISTEUM MELICOIDEUM, (Mx.) Vasey, var. COOLEYI, (Gr.)
Scribn., Rhodora, VIII: 87.

Graphephorum melicoides, Cat. Can. Plants II: 228 in part.

Little Cascapedia River, Que. (*Collins, Fernald and Pease.*)
River de Brig, Anticosti, Que., No. 29,479; Chelsea, Que.,
No. 61,297; Hastings Co., No. 29,482; Johnstone's Harbour,
Lake Huron, Ont., No. 26,222. (*John Macoun.*) Galt, Ont.
(*W. Herriot.*) Fishing Islands, Lake Huron, Ont. (*J. Bel.*)

*Specimens have been distributed from the herbarium of the Geological Survey under these numbers.

AVENA STRIATA, Michx. forma ALBICANS, Fernald, Rhodora, VII: 244.

A. striata, Cat. Can. Pl. II: 213 in part.

Distinguished from the species only by its pale, straw-colored glumes. Collected on Mount Albert, Gaspé, by John Macoun in 1882, No. 30,085. Described from specimens found at the same place and at Bic, Que., by Messrs. Fernald and Collins in 1904 and 1905.

BROMUS JAPONICUS, Thunb.

B. patulus, Mert. & Koch.

Collected at Toronto, Ont., by Mr. W. Scott and called *B. squarrosus* to which it is very similar. Mr. Scott's specimens differ from typical *B. Japonicus* in their short-rayed panicles. Introduced. New to Canada.

SCIRPUS VALIDUS, Vahl.

S. lacustris, Cat. Can. Pl., II: 99 in part.

Sable Island, N.S., 22,633. (*Macoun.*) Campbellton, N.B., 32,359. (*R. Chalmers.*) Ottawa, Ont., 7,541; Chelsea, Que., 61,187; Niagara Falls, Ont., 34,583; Algonquin Park, Ont., 21,906; Lake Nipigon, Ont., 32,357. (*Macoun.*) Edmonton, Ont., 25,344. (*Jas. White.*) Grassy Narrows, Lake Winnipeg, 32,356. (*J. M. Macoun.*) Brandon, Man., 16,407; Sage Creek, Sask., 16,410; Cardston, Alta., 68,933; Cypress Hills, Alta., 16,409. (*Macoun.*) An abundant and widely distributed species not represented in our herbarium from west of Alberta.

SCIRPUS OCCIDENTALIS, (Watson) Chase, Rhodora, VI: 68.

S. lacustris, Cat. Can. Pl. II: 99 in part.

S. lacustris, var. *occidentalis*, Wat.; Cat. Can. Pl. II: 100.

Brackley Point, P.E.I., 32,360; Annapolis, N.S., 32,358; Grand Narrows, Cape Breton Island, N.S., 20,772; Sarnia, Ont., 34,582. (*Macoun.*) Toronto, Ont. (*W. Scott.*) Skull Creek, Crane Lake, Sask., 7,540; Prince Albert, Sask., 16,408; South Saskatchewan River, 32,361; Kananaskis, Rocky Mountains, 32,362. (*Macoun.*) Canoe River, head of Columbia River, Rocky Mts., 20,773. (*W. Spreadborough.*) Widely distributed in British Columbia but seldom collected.

S. occidentalis is distinguished from *S. validus* by achenes $\frac{1}{3}$ larger, by scales $\frac{1}{4}$ — $\frac{1}{3}$ longer than the achene and nearly twice as long as the scales of *S. validus*, viscid-pubescent, overlapping $\frac{1}{2}$ their length or more; by the cylindric more densely fruited spikelets in capitate clusters; and by the denser umbels and harder culms.

SCIRPUS HETEROCHÆTUS, Chase, Rhodora, vi : 70.

Distinguished from *S. validus* and *S. occidentalis* by the 3-cleft style, by the triquetrous achene, by the fragile bristles, fewer and shorter. An apparently rare species in the United States and not yet recorded from Canada. Mr. Ezra Brainerd found the three species growing in Lake Champlain where *S. occidentalis* begins to ripen seeds about six weeks later than *S. validus*; *S. heterochætus* flowers there at a date midway between the two.

RHYNCHOSPORA CAPILLACEA, Torr., var. *LÆVISETA*, Hill.

In bogs at Southampton, Ont., Aug. 20th, 1901, No. 34,573. (*John Macoun*.) Wet sand along the shore of Lake Huron at Oliphant, Ont. (*A. B. Klugh*.)

CAREX KATAHDINENSIS, Fernald, Rhodora, ii : 171.

Collected by Prof. Ezra Brainerd at the "Grand Discharge" of Lake St. John, Que., Aug., 1901.

JUNCUS BUFONIUS, L. var. *HALOPHILUS*, Buch. & Fernald, Rhodora, vi : 39

Mr. Fernald records this variety from Riviere du Loup, Que., New Carlisle, Que., Bonaventure River, Que., and from Tracadie Beach and beach near Summerside, Prince Edward Island. Our only herbarium specimens are from Grand Narrows, Cape Breton Island, N.S., 20,708, (*John Macoun*), and mouth of Dartmouth River, Gaspé Co., Que. (*Collins, Fernald and Pease*.)

ALLIUM RECURVATUM, Rydb.

Confounded with *A. cernuum* of the east. Differs from *A. cernuum* in the leaves, the more slender, ridged scape, the larger involucre and the more distinct midveins of the

perianth segments. In *A. cernuum* the leaves are almost flat and more or less keeled. In *A. recurvatum* there is no keel and the channel is rounded as well as the back. The leaves of *A. cernuum* are also much wider, the flowers are generally much paler in that species and the perianth segments have an indistinct midvein. *A. recurvatum* is common in the Rocky Mountains and British Columbia.

HABENARIA MACROPHYLLA, Goldie.

This species is much rarer than *H. orbiculata* with which in recent years it has been confounded. *H. orbiculata* ranges from the Atlantic to the Pacific and north to Alaska. *H. macrophylla* has not been found west of Wisconsin. Our specimens are from Newfoundland, 13,771, (*B. L. Robinson* & *H. Schrenk*), and Muskoka, Ont., 27,223. (*W. Spreadborough*.) Many specimens of both species have been examined by Mr. Oakes Ames; the spur of *H. orbiculata* was found to be from 16 to 27 mm. long, while that of *H. macrophylla* ranged from 32 to 43 mm. in length. The flowers of the latter species are also much larger.

SALIX CHLOROLEPIS, Fernald, Rhodora, VII : 186.

Meadows at the headwaters of Ruisseau au Diable, Mt. Albert, Gaspé, Que. (*Collins* and *Fernald*.)

SALIX MACROSTACHYA, Nutt.

Along the Kettle River at Cascade, B.C. In flower, June 26th, 1902, No. 68,128. (*J. M. Macoun*). New to Canada.

SALIX SERISSIMA, (Bailey) Fernald, Rhodora, VI : 6.

S. lucida, Cat. Can. Pl. II : 450 in part.

Mr. Fernald gives no other Canadian localities for this species than "north shore of Lake Superior." Our herbarium specimens are from the mouth of Albany River, James Bay, Hudson Bay, No. 62,628. (*W. Spreadborough*); Salt Lake, Anticosti, Que., No. 24,584. (*John Macoun*); Galt, Ont., No. 63,120. (*W. Herriot*); Nipigon, Lake Superior, Ont., No. 24,583. (*John Macoun*); Severn River, Keewatin, No. 2,028, Beren's River, Man., No. 24,618, and Muskeg Island, Lake

Winnipeg, Man., No. 24,619. (*Jas. M. Macoun*); Grattan Creek west of Battle River, Alta.; Edmonton, Alta., No. 24,621, and Bow River at Morley, Alta., No. 24,620. (*John Macoun*).

SALIX LUCIDA, Muhl., var. *INTONSA*, Fernald, *Rhodora*, vi: 11.

Recorded by Mr. Fernald from St. John River and tributaries, Maine, Quebec, and New Brunswick. Our specimens are from Montmorency Falls, Que., Nos. 68,782 and 68,783. (*John Macoun*.)

SALIX LUCIDA, Muhl., var. *ANGUSTIFOLIA*, Anderson.

Grand Lake, N.B., No. 24,586. (*John Brittain*); bank of Exploit River, Newfoundland, No. 13,674. (*Robinson & Schenk*.)

HUMULUS JAPONICUS, Sieb. & Zucc.

In waste places at Wakefield, Que., 1903. (*John Macoun*.)
Naturalized.

COMANDRA RICHARDSIANA, Fernald, *Rhodora*, vii: 32.

C. umbellata, Nutt., in part.

So far as shown by our specimens *C. umbellata* does not occur in Canada, everything so called being the recently described *C. Richardsiana*.

POLYGONUM NUTTALLII, Small.

P. intermedium, Macoun, *Cat. Can. Plants*, ii: 352.

Grassy banks, Middle Creek, Chilliwack River, B.C., No. 54,740. (*J. M. Macoun*) Not recorded from mainland of B.C.

POLYGONUM PUNCTATUM, Ell., var. *LEPTOSTACHYON*. (Meisn.) Small.

Low ground near Sumas Lake, B.C. No. 54,752 (*J. M. Macoun*) New to Canada. Abundant, but perhaps introduced.

POLYGONUM BISTORTOIDES, Pursh.

A common species at an altitude of between 5,000 and 6,000 feet on mountains in the Chilliwack and Skagit valleys, B.C., near the International Boundary. (*J. M. Macoun*.)

CHENOPODIUM BOSCIANUM, Moq.

Sandy thickets, Pelee Point, Lake Erie. No. 54,724.
(*John Macoun.*) New to Canada.

AQUILEGIA COLUMBIANA, Rydb., Bull. Torr. Bot. Club, XXIX: 145.

This species is somewhat intermediate between *A. formosa* and *A. truncata* and has been mistaken for both. It has the habit, spur and sepals of the former and the short truncate lamina of the latter. From Banff to Alaska.

DELPHINIUM BROWNII, Rydb., Bull. Torr. Bot. Club, XXIX: 148.

This is most nearly related to *D. glaucum* but differs in the puberulent leaves with narrow segments, the lax raceme with more erect pedicels and the darker flowers. Described from specimens collected at Banff in 1893 by Addison Brown. A common plant in that region.

RANUNCULUS ALLENI, Robinson, Rhodora, VII: 220.

R. affinis var. *leiocarpus*, Cat. Can. Pl. 1: 18.

First collected by Mr. J. A. Allen on Mt. Albert, Gaspé, Que., in 1881, the next year by John Macoun at the same place, No. 1,015, and in 1883 on Table Top Mountain not far from Mt. Albert by James Porter, No. 68,678. Other localities cited by Dr. Robinson are: Okkak, Labrador, and Rama, Labrador.

RANUNCULUS GLABERRIMUS, Hook.

Pentit. ton, Lake Okanagan, B.C., April 12th, 1903. No. 59,519. (*W. Spreadborough.*) Not recorded from that region.

RANUNCULUS YUKONENSIS, Britt.

Near Peace River Landing, Atha., No. 59,521. June 8th, 1903. (*J. M. Macoun.*) Recorded before only from the Yukon district.

CAULOPHYLLUM THALICTROIDES, Mx.

In woods along the Assiniboine River near Portage La Prairie, Man. In flower, May 31st, 1906. (*W. Herriot.*) Western limit in Canada

LEPIDIUM DRABA, L.

Waste places at Trail, Columbia River, B.C. No. 67,986.
(*J. M. Macoun.*) Not recorded from B.C.

LEPIDIUM SPINOSUM, L.

Near the "ball grounds," Toronto, Ont., 1904. (*W. Scott*) New to Canada. A native of the Orient and of Greece.

SISYMBRIUM OFFICINALE, Scop.

Rare in Canada, our specimens being from Niagara, Ont., No. 33,859. (*John Macoun*); Wingham, Ont., No. 2,110 (*J. A. Morton*), and Esquimauit, Vancouver Island, B.C., No. 2,109. (*John Macoun*). The inflorescence and pods, even at full maturity, subtomentulose.

SISYMBRIUM OFFICINALE, Scop. var. LEIOCARPUM, DC.

This variety as pointed out by Dr. Robinson (*Rhodora*, vol. VII: 102) is the common form in North America being represented in our herbarium by specimens from Baddeck, Cape Breton Island, N.S., No. 18,039, (*John Macoun*); Ottawa, Ont., No. 2,113, (*John Macoun*); Wakefield, Que., No. 59,813. (*John Macoun*); Belleville, Ont., No. 2,114, (*John Macoun*); Nelson, Kootenay Lake, B.C., No. 2,111, (*John Macoun*); Sicamous, B.C., No. 2,112, (*John Macoun*); Nanaimo, Vancouver Island, B.C., No. 2,115, (*John Macoun*); Chilliwack River, B.C., No. 33,860. (*J. M. Macoun*). The inflorescence nearly smooth; the pods entirely glabrous or with a few scattered hairs.

RADICULA CLAVATA, (Rydb.) Bull Torr. Bot. Club., XXIX: 235.
Nasturtium palustre, DC. var., Macoun, Cat. Can. Plants, II: 300 in part.

Port Heney and Agassiz, B.C., 1889. (*John Macoun.*)

DENTARIA TENELLA, Push.

Harrison, B.C., 1902 No. 63,504. (*W. Spreadborough.*)
Eastern limit in Canada.

DRABA McCALLÆ, Bull. Torr. Bot. Club, XXIX: 241.

Moose Mountain, Elbow River, Alta., No. 18, 139, 1897;
Summit of Pipestone Pass, Rocky Mt. Park, No. 64,442,
1904. (*John Macoun*.) Described from specimens collected
by Mr. W. C. McCalla at Banff in 1899. This species belongs
to the *D. incana* group but differs from that species in the
elongated peduncle, long pedicels, short pubescent pod and
large petals.

ARABIS COLLINSII, Fernald, Rhodora, VII: 32.

"Quickly distinguished from *A. Holboellii* by the loose
hispidulous pubescence of the stem and pedicels, the smaller
flowers and the very slender acutish pods." Collected on dry
limestone conglomerate ledges, headland in the harbour of
Bic, Rimouski Co., Que., July 18, 1904. (*J. F. Collins &*
M. L. Fernald.)

DROSERA ROTUNDIFOLIA, L., var. COMOSA, Fernald, Rhodora, VII: 9.

A dwarf variety of the common sundew with crimson or
roseate instead of white flowers; the petals are sometimes
foliaceous and the carpels are developed in maturity into
green, glandular broadly obovate or oblate petioled leaves.
Collected in abundance near the mouth of Grand River, Gaspé
Co., Quebec., in 1904 by Messrs. J. F. Collins, M. L. Fernald
and A. A. Pease. An examination of a large series of speci-
mens of *D. rotundifolia* in our herbarium shows nothing
approaching this variety.

SAXIFRAGA HIERACIFOLIA, Waldt and Kit.

Pond's Inlet, Lat. 72° 45', Cockburn Island. Aug 20th,
1904. (*Dr L. E. Borden*.)

THE SPRING MIGRATION OF BIRDS AT OTTAWA OF
THE YEAR 1906, COMPARED WITH THAT
OF OTHER SEASONS

By C. W. G. EIFRIG.

The winter of 1905-06 was in several respects a remarkable one. There was less snow and fewer days of severe cold weather than for many preceding winters. It was more open and mild, than for many past seasons. All this was somewhat changed at a time when one expects to see the end of winter come in earnest, in March. There was more snow and cold then, than apparently had been in the previous winter months combined, or as someone told the writer: Winter only commenced in March. That such unusual weather conditions would naturally tend to modify biological conditions in the plant and animal kingdoms, was to be expected. All nature-lovers, the botanists, entomologists, etc., therefore eagerly looked forward into the now sadly retarded spring, to see how this would be made manifest in their several lines of observation. In no class of biota, however, would the effect of such unusual climatic conditions be more noticeable than in the birds, as that fascinating, mysterious natural phenomenon of their migration is in many species greatly dependent on the weather. The ornithologist therefore was especially on the alert this spring to see how the coming of his feathered friends had been affected by the queer ending of the winter and beginning of the vernal season.

One somewhat unexplainable fact was noted by them already in winter. One would think, that in such a mild winter as the last was for its greater part, there would be more of our usual permanent residents amongst birds, or of the erratic Canadian winter birds seen, or at least as many, as in the more severe winters. But the reverse was true. While in the severe winter of 1903-4 pine grosbeaks were plentiful here all winter, and 1904-5 Canada jays and sharpshinned hawks, together with, as the appended list shows, occasional downy woodpeckers, pine siskins, redpolls, brown-breasted nuthatches, and the everpresent jolly little chickadee, these and similiar birds were last winter conspicuous by their absence in the silent wintry woods.

Quite a number of the birds included in this list are irrelevant to the scope of this article, but are included for completeness' sake, to show about when they may be looked for and what birds come this way at all. Such birds that do not show anything in this connection are e. g. the redpoll, pine siskin, brown-breasted nuthatch, crow, blue jay, etc., because they may be considered permanent residents, or because they do not follow any apparent rules in their coming and going, their presence or absence. Other such erratic birds are the pine grosbeak, Canada jay, evening grosbeak, arctic-three-toed woodpecker, etc., which are here omitted. Others, such as the ducks, rails, herons, hawks are not quoted to prove much in this connection, because they are not easily observed or are rare, so that they may be for days or even weeks in their chosen haunts, before the ornithologist, who can not always go to such difficult places, may see them.

The effect that we would expect the severe outgoing of the winter and incoming of the spring to have upon the migration of birds, is that the birds would be retarded to a greater or less extent. And this is what the following list shows. The first commonly observed migrant in our parts is the prairie horned lark. That comes at the end of February. Now, because last winter up to that time was unusually mild, the coming of this little bird was earlier than usual, Feb 20, or at least no later. Then came the snowy and cold March, the effect of which can be seen by the lateness of arrival of such birds as the purple finch, robin, bronzed grackle, song sparrows, red-winged black bird, bluebird, and junco, which here are the first of the real and regular migrants. These were this year kept back for a time of from several days to two weeks. Then came warm, May-like weather in April, which made the date of arrival of the species falling into this month again normal, or may have even accelerated it with some, whereas the somewhat raw weather of the first half of May again had the contrary effect. It may be said, that a single, dejected-looking robin was this year seen as early as March 9th in a garden along the Rideau, and again on the 17th, but the real robin migration did not begin before the date given.

I must also state that much material in the line of dates has been furnished to me by other members of the Ornithological sec

tion, by the Messrs. G. and E. White, Kingston and Gallup, and by Mrs. R. D. Brown and Miss Lees of Ottawa East.

	1906.	1905.	1904.
Sharp-shinned Hawk	.....	Feb. 18	Jan. 3
Crow	Jan. 28	Feb. 18	Mar. 3
Prairie Horned Lark	Feb. 20	Feb. 28	Mar. 7
Brown-breasted Nuthatch	Mar. 10	Mar. 1	Jan. 14
Great Gray Owl	Feh. 1	.....	.....
Cedar Bird	Mar. 17	Mar. 28	May 26
Purple Finch	Mar. 29	Mar. 1	May 4
Golden-eye (<i>Clangula Am.</i>)	Mar. 29	Apr. 17	Jan. 4
Robin	Mar. 31	Mar. 19	Mar. 24
Bronzed Grackle	April 2	Mar. 27	Mar. 28
Song Sparrow	April 2	Mar. 18	Mar. 24
Red-winged Blackbird	April 2	Mar. 24	Mar. 25
Bluebird	April 3	Mar. 24	Mar. 24
American Herring Gull	April 3	April 10	Mar. 24
Red-shouldered Hawk	April 1	April 24	April 25
Canada Goose	April 4	April 4	.....
White-breasted Nuthatch	April 4	Feb. 28	Jan. 30
Meadowlark	April 5	April 3	April 5
Blue Heron (<i>vulgo</i> Crane)	April 5	April 27	April 18
Junco	April 6	Mar. 23	Mar. 26
Hooded Merganser	April 7	April 17	April 14
Sparrow Hawk	April 7	April 18	April 21
Cowbird	April 8	Mar. 29	Mar. 30
Downy Woodpecker	April 8	April 11	Jan. 14
Tree Swallow	April 8	April 3	April 8
Black Duck	April 7	April 13	.....
Wood Duck	April 7	.....	.....
Phoebe	April 9	April 8	Mar. 28
Tree Sparrow	April 9	Mar. 24	April 15
Red-tailed Hawk	April 9	April 25	April 15
Marsh Hawk	April 12	April 1	April 17
Golden-crowned Kinglet	April 14	April 8	April 14
Hermit Thrush	April 14	April 10	April 14
Brown Creeper	April 15	Mar. 30	Mar. 12
Vesper Sparrow	April 15	April 12	April 15
Savanna Sparrow	April 15	April 11	April 18
Yellow-bellied Sapsucker	April 15	April 10	April 9
Chipping Sparrow	April 15	April 12	April 23
Flicker (<i>Colaptes auratus</i>)	April 16	April 10	April 18
Migrant Shrike	April 16	Mar. 30	April 6
Killdeer	April 16	Mar. 28	April 8
Kingfisher	April 16	April 8	May 5

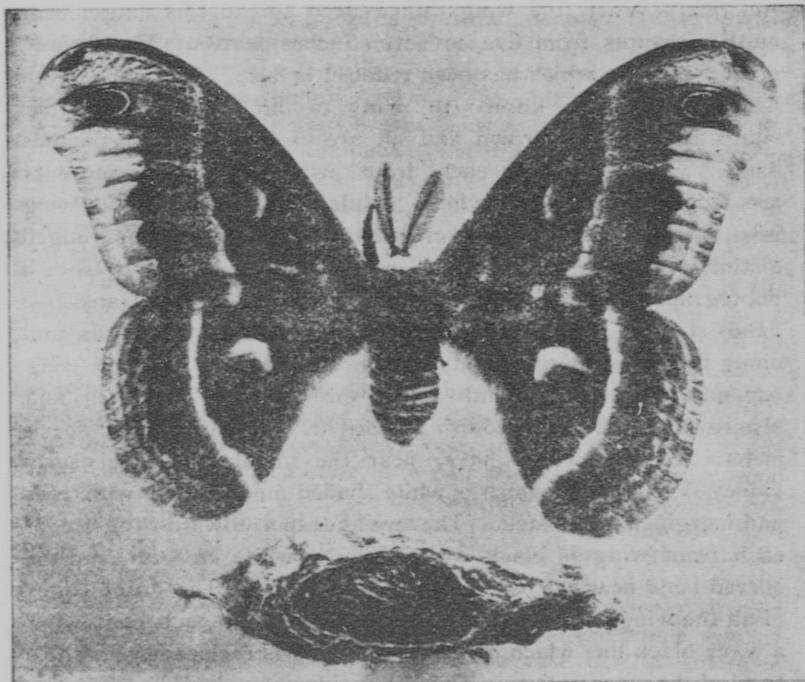
	1906.	1905.	1904.
Bittern	April 16	May 24	May 3
Blue Jay	April 16	Feb. 18	Mar. 17
Goldfinch	April 17	Mar. 13	May 26
White-throated Sparrow	April 15	April 23	May 7
Osprey, Fish Hawk	April 18	April 17	.....
Winter Wren	April 18	April 27	.....
Swamp Sparrow	April 18	May 8	April 26
Wilson's Snipe	April 20	May 4	April 14
Pied-billed Grebe	April 20	.....	April 29
Barn Swallow	April 21	April 25	April 26
Hairy Woodpecker	April 21	May 5	May 17
Loon	April 21	.....	.....
Purple Martin	April 22	April 23	April 16
Chimney Swift	April 30	May 2	May 7
Ruby-crowned Kinglet	May 1	April 27	.....
Brown Thrasher	May 1	May 6	.....
Whippoorwill	May 1	May 13	May 5
House Wren	May 2	April 28	May 5
Spotted Sandpiper	May 2	May 4	May 5
Myrtle Warbler	May 2	May 1	May 4
Black-and-white Warbler	May 4	April 28	May 4
Fox Sparrow	May 4	April 27	.....
Yellow Warbler	May 4	May 1	May 7
Bobolink	May 5	May 2	May 7
Connecticut Warbler	May 5	.....	.....
Cooper's Hawk	May 6	.....	Feb. 16
Warbling Vireo	May 6	May 10	May 12
Veery	May 6	May 6	May 7
Black-throated Green Warbler	May 7	May 1	May 10
Parula Warbler	May 7	May 10	May 7
Nashville Warbler	May 7	May 7	May 10
Pine Warbler	May 7	May 6	.....
Black-throated Blue Warbler	May 7	May 10	May 16
Kingbird	May 7	May 5	May 7
Rusty Grackle	May 7	April 10	April 18
Sera	May 8	.....	May 26
Blackburnian Warbler	May 10	May 1	May 7
Cliff Swallow	May 9	May 17	.....
Waterthrush	May 11	May 8	May 26
Great Crested Flycatcher	May 11	May 12	May 7
Yellow-throated Vireo	May 11	.....	.....
Least Flycatcher, Chebec	May 11	May 5	May 6
Woodcock	May 11	.....	May 26
Maryland Yellowthroat	May 11	May 4	May 10

	1906.	1905.	1904.
Cape May Warbler	May 12	May 22	.....
Rose-breasted Grosbeak.....	May 13	May 11	.....
Olive-backed Thrush	May 13	May 16	.....
Chestnut-sided Warbler.....	May 13	May 7	May 10
Ovenbird	May 13	May 6	May 10
Baltimore Oriole.....	May 13	May 6	May 8
Bank Swallow.....	May 13	May 18	.....
Yellow Palm Warbler	May 14	May 1	.....
Grey-cheeked Thrush.....	.....	May 14	.....
Red-eyed Vireo	May 15	May 6	May 12
Blue-headed Vireo.....	May 15	May 7	May 7
Catbird.....	May 15	May 6	May 12
Redstart	May 15	May 5	May 5
Hummingbird	May 15	May 11	.....
Bay-breasted Warbler.....	May 16	May 19	May 23
Magnolia Warbler	May 16	May 10	May 10
White-crowned Sparrow.....	May 16	May 6	May 10
Nighthawk.....	May 16	May 14	May 11
Tennessee Warbler.....	May 17	May 24	May 23
Scarlet Tanager.....	May 17	May 14	May 21
Wood Pewee.....	May 17	May 4	May 17
Solitary Sandpiper.....	May 18	.....	May 12
Mourning Warbler.....	May 19	May 12	May 23
Canadian Warbler	May 19	May 12	May 26
Yellow-bellied Flycatcher.....	May 19	May 23	.....
Alder Flycatcher.....	May 19	May 24	.....
Least Sandpiper.....	May 21	.....	.....
Blackpoll Warbler.....	May 21	May 17	May 23
Wilson's Warbler	May 21	May 19	May 26
Red-headed Woodpecker.....	May 26	.....	April 26
Olive-sided Flycatcher.....	May 28	May 24	May 26
Broad-winged Hawk.....	May 28	April 25	.....
Philadelphia Vireo	May 30	May 17	.....
Indigo Bird.....	.....	May 24	May 26

NATURE STUDY No XXXVII.

THE CECROPIA EMPEROR MOTH (*Samia cecropia*, LINN.)

BY ARTHUR GIBSON, Assistant Entomologist, Experimental Farm, Ottawa.



Cecropia Emperor Moth and Cocoon, reduced in size.

Among our native insects, probably none attract greater attention from those who have made no study whatever of entomology than the large Emperor Moths, the caterpillars of all of which are true silk-worms. These moths are the largest we have in North America, and, being of such a size and also of striking beauty, they always command admiration. Unlike many other moths, their mouth parts are aborted and consequently they are unable to eat. In their caterpillar state, however, they are very voracious eaters and during that period of their existence will consume many times their weight of food. When full grown these

large, heavy caterpillars are found hanging on the under-side of leaves and twigs, but on account of their green colour they are rather difficult to detect.

The Cecropia Emperor Moth, the subject of this article, is the largest and one of the most beautiful insects found in North America. When the wings have been spread this magnificent moth measures from five to seven inches across. The figure* given herewith, which has been reduced in size, shows the moth which is doubtless known to many of our readers. The four wings are of a rich brown and all are crossed with conspicuous bands. The band on each front wing is dull red, more or less edged within with white, while that on each hind wing is a brighter red, almost crimson in some specimens, edged distinctly inside with white. In the figure, which is from a photograph, only the white portions, of course, of these transverse bands show. The front wings are dusted with gray towards and along the upper margin, and through that portion of each wing beyond the transverse band. Near the centre of the wing, and also towards the base, reddish patches are present in most specimens. All the wings have, near the middle, a large nearly kidney-shaped mark which is white shaded more or less with red, and margined with black. The eye-like spot towards the tip of each front wing is black with a bluish white crescent, and the curved band near the base is white and black. The outer edges of all the wings are paler, and there is present on each front wing a wavy black line which on each hind wing is replaced by a double band of the same colour. The upper side of the body is dull red, as are also the legs. Just behind the head there is a wide white band. The abdomen in most specimens is reddish-brown, the cross bands of white being very conspicuous. Both sexes are similar in appearance, the female only differing from the male in the larger abdomen and much smaller antennæ, or feelers.

It is often difficult to understand an author's reason for selecting the name by which a species is to be known, and much discussion among naturalists has taken place regarding Linnæus's application of the name of the ancient city of Athens, to this moth. The late Dr. Asa Fitch in his third report on the Noxious and

*From Fourth Annual Report of the Entomologist of the State Experiment Station of the University of Minnesota, kindly loaned by Prof. F. L. Washburn.

other Insects of the State of New York, gives the following explanation:—"The idea which was present in the mind of Linnæus, when he named this splendid moth, we think is sufficiently evident. The Athenians were the most polished and refined people of antiquity. The moths are the most delicate and elegant of insects; they are the Athenians of their race. Cecrops was the founder, the head of the Athenian people. When names of men were bestowed upon cities, ships, or other objects regarded as being of a feminine gender, classical usage changed these names to the feminine form. The moths (*Phalæna*) being feminine, and the name of Cecrops being more euphonious in this form, probably induced Linnæus to change it in the manner he did. The name thus implies this to be the leader, the head of the most elegant tribe of insects, or in other words, the first of all the insect kind. What name more appropriate can be invented for this most sumptuous moth?"

The cocoon of this insect, shown beneath the moth in the above figure, is the largest and best known of the cocoons found in this country. It is about three inches in length, an inch or more in width at its widest part, and tapers to both ends. Some specimens, of course, are larger than this; we have examples that measure four inches long and two inches wide at the centre. In colour the cocoon is a rusty gray, or brownish. If one is cut into with a sharp knife, or a pair of scissors, an inner, oval cocoon will be found. Within this is a large, black pupa, to one end of which is attached the head of the caterpillar and the cast skin of its body. This inner cocoon will be noticed to be much more closely woven. It is interesting to watch the caterpillar making its cocoon. From the time it begins to spin it never ceases until its work is completed, and the whole cocoon is spun in one continuous thread. In the case of the American Silkworm, *Telea polyphemus*, L., it has been stated by Trouvelot that this caterpillar in making its cocoon, will have moved its head to and fro, in order to distribute the silk, 254,000 times, the length of time taken to complete this operation being from three to five days.

During the past season the caterpillars of the *Cecropia* Emperor Moth have been more than usually abundant in eastern Canada. It is altogether likely, therefore, that many cocoons will be found on apple, maple, plum, and other trees during the coming winter. The moths emerge in the latter end of May and early in June, and if any of our members would like to experience the pleasure of watching one of these large Emperor Moths escaping from its cocoon, it is only necessary to collect one or two of the cocoons, and keep them in an

out-building throughout the winter, bringing them into the house next May. The cocoons, of course, should be put into a box with rough sides, so that when the moths emerge they can hold on while their wings are expanding. It will be noticed that one end of the cocoon is spun very loosely, and it is from this end that the moth emerges. The head first appears, then the front pair of legs, and soon the other pairs of legs, the heavy body, and the undeveloped wings. As soon as it has attached itself to a nearby object, these latter soon expand and in less than an hour the two pairs of wings attain their full size.

The caterpillars of the Cecropia Emperor Moth hatch from whitish eggs laid in June. They moult, or cast their skins, four times before reaching full growth. At first they are black, changing in the next stage to a deep orange, and in the third stage to yellowish green. In the next and also in the last stage the colour is more of a bluish green. In all the stages the body bears tubercles the colours of which are different after each moult. When full grown the Cecropia caterpillar is from three to four inches long, and is about as thick as a man's thumb. On segments 2 and 3, the tubercles are large and of a bright coral red colour; the other tubercles on the back are smaller and yellow, excepting those on the first and last segments which are blue, as are also the smaller tubercles along the sides. These caterpillars although so beautiful and striking in appearance, from their great size and conspicuously coloured tubercles, are considered very disgusting creatures by many, and this of course is but natural. It would not be human nature if everyone had the same likes and dislikes—it takes all kinds of people to make a world.

The caterpillar of this moth is a very general feeder and over fifty different plants have been recorded upon which it has been found feeding. In Canada the favourite food plants are apple, maple, birch, cherry, plum and willow. Although this caterpillar has a very voracious appetite, it is seldom that it really does very much harm, as it is unusual to find more than two or three larvæ on the same tree, and when their presence is noticed they can easily be removed by hand.

This grand insect occurs in Canada in Ontario, Quebec and the Maritime Provinces, and specimens may every year be collected or seen flying around electric lights. In certain seasons, however, their numbers are greatly reduced by natural parasites, the most important of which are the Long-tailed Ophion, *Ophion macrurum*, L., which forms a single close cocoon inside that of its host, and *Cryptus extrematis*, Cresson, of which several occur inside a single caterpillar, and when this latter has spun its winter resting place they emerge and entirely fill the space with their own cocoons.

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