

NOVEMBER, 1901.

VOL. XV, No. 8.

THE OTTAWA NATURALIST.

Published by the Ottawa Field-Naturalists' Club.

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(ISSUED NOVEMBER 1, 1901.)

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THE OTTAWA NATURALIST.

VOL. XV.

OTTAWA, NOVEMBER, 1901.

No. 8.

ON SOME CANADIAN SPECIES OF GENTIANA : SECTIO CROSSOPETALÆ, FRÆL.

By THEO. HOLM.

(With four Plates.)

That very natural group of North American species of Frœlich's section *Crossopetalæ*¹, the so-called "Fringed Gentians," has long been in need of careful revision. The latest treatment of the genus, as it occurs in North America, is the one presented by Asa Gray in the Synoptical Flora², wherein the species, however, are described with much the same distinctions as in other works of the same author. Writers of a more recent date have generally felt so much influenced by that author's decisions that they have not seemed to question the correctness of his pronouncements, and have not examined the diagnoses further. Consequently the same species are enumerated and the diagnoses faithfully reproduced in the manuals and local Floras, on the strength of which botanists abroad have finally attributed a geographical range to some of these species extending throughout the northern hemisphere.

Among these *Gentiane* is Gunner's *G. serrata*, which by Gray and subsequent authors is unanimously regarded as an inhabitant of North America, and its geographical distribution is by Gray (l. c.) given as "Newfoundland, Canada and N. W. New York to Saskatchewan and northward, and west to Colorado and W.

¹ Frœlich, Joseph Al. De Gentiana dissertatio Erlangen, p. 109. 1796.

² Gray, Asa. Synoptical Flora of North America, Vol. 2, p. 116. New York. 1886.

are of special interest in regard to the supposed synonyms, and Pallas' work (l. c.) gives an excellent description and figure of his *G. ciliata*, which is known now as *G. barbata* Frœl. A very comprehensive treatise of the various sections of *Gentiana* is presented by N. Kuznezow in Engler and Prantl's *Natuerliche Pflanzenfamilien*. But as we have stated above, the diagnosis of *G. serrata* Gunn. does not seem to have been fully appreciated, and moreover there are some salient points in its floral structure which have not been mentioned by Scandinavian authors. The diagnosis may be written as follows :

GENTIANA SERRATA, Gunn.

Annual or biennial, glabrous ; stem erect, quadrangular, 5 to 16 cm. high, branched from the base: leaves mostly crowded near the root, obovate-lanceolate or the upper linear-lanceolate, acute : peduncles long and quite stout, 1-flowered : calyx about 2 cm. long, unequally cleft to near the middle, 4-lobed, the longer lobes lanceolate, the shorter ovate, all acuminate with membranaceous margins, but none carinate : corolla deep blue, 3 to 4 cm. long, 4-lobed, cleft to about $\frac{1}{3}$ of its length, the lobes nearly erect, oblong, erosely denticulate across the obtuse summit, mostly without lateral fringes and destitute of basal nectariferous glands* : stamens 4 with slender filaments : ovary fusiform, stipitate with an almost sessile 2-lobed stigma : mature capsule longer than the corolla: seeds scabrous from short papillæ.

Said to bloom in July or August, and has been collected on the sea-shore of Norway from 66° 10' to 70° 50' N. lat., and on the west coast of Greenland at 61° N. lat., where Vahl first collected it. The plant is also said to be frequent in the northern parts of Iceland, but we have seen no specimens from there, and are, therefore, not certain whether the Icelandic plant is identical with the Norwegian, the former having been described by Rottbœll as *G. detonsa*.¹⁰

* Hartman (l. c.) describes the flower as tetramerous or, but seldom, pentamerous. None of the Scandinavian authors mention nectariferous glands in this species, and they were totally absent in our material from Norway and Greenland.

¹⁰ Acta Acad. Hafn., Vol. 10, p. 435. (Not seen.)

If we compare now the Canadian allies of *G. serrata*, formerly considered as representing this species, we might point out at once some of the most conspicuous characters possessed by these: the frequently carinate and scabrous calyx, the very veiny and fringed corolla-lobes, the broadly winged stamens, the constant presence of nectariferous glands at the base of the corolla, the more or less conspicuous style, the roundish stigma and the strongly papillose seeds. These characters appear to be constant and taken together with some habitual differences warrant the segregation of the following species:

GENTIANA MACOUNII, Holm.

(Plate XI, Figs. 1 and 2.)

Annual or sometimes biennial, glabrous excepting the calyx: stem strict, quadrangular, 5 to 30 cm. high, branched from the base: lowest leaves spatulate or oblong lanceolate, the upper linear-lanceolate, acute: peduncles long and stout, 1-flowered: calyx (fig. A) purplish-green, unequally cleft to near the middle, 4-lobed, the longer lobes lanceolate, the shorter ovate with broad membranaceous margins, all acuminate and carinate, scaberulous with minute short papillæ, especially along the keels: corolla (fig. B) deep bluish, $1\frac{1}{2}$ to 3 cm. long, cleft to about $\frac{1}{3}$ of its length, 4-lobed, the lobes very veiny, slightly spreading, broad and fringed along the sides, but merely denticulate across the summit: nectariferous glands 4 at the base of the corolla-lobes: stamens 4 with broadly winged filaments, these ciliate in the middle: anthers at first introrse: pistil (fig. C) fusiform, stipitate with short but distinct style: stigma roundish: mature capsule shorter than the corolla: seeds rough with numerous long papillæ.

The specimens examined are from Fort Pitt, Saskatchewan; Bow River at Blackfoot Crossing, Lees Creek, Waterton Lake and Banff, Alberta (*Macoun*), and Red Deer, Alberta (*H. H. Gaets*). Habitat given as: Prairies, gravelly soil and margins of marshes. Flowers from July to September.

GENTIANA PROCERA, Holm.

(Plate XII, Figs. 3, 4 and 5.)

Annual, glabrous except the calyx; stem erect, angled, 25 to about 50 cm. high, branched above: lowest leaves spatulate or

oblong-lanceolate, obtuse, the upper linear-lanceolate, acute : branches 1-3 flowered with 2 or 3 pair of leaves : calyx (fig. G) $1\frac{1}{2}$ to 3 cm. long, unequally cleft to the middle or a little above, 4-lobed, the longer lobes linear-lanceolate, the shorter much broader with membranaceous margins, all acuminate and carinate, scabrous : corolla (fig. H) deep blue, 2 to 5 cm. long, 4-lobed, the lobes very veiny, roundish with many long fringes along the sides and dentate across the summit : nectariferous glands as in *G. Macounii* : stamens 4, the filaments naked otherwise as in the preceding species : ovary (fig. I) shortly stipitate with short style and a roundish, somewhat lobed stigma : mature capsule much shorter than the corolla : seeds with long papillæ.

Collected near Sarnia, Lambton County, Ontario, by C. K. Dodge, and in a swampy place at Stony Mountain in Manitoba, with flowers from August to September.

Several specimens from United States are preserved in the Gray herbarium of Harvard University from the following stations : Goat island and Strawberry island, Niagara Falls ; shore of Lake Superior ; Charlevoix in Michigan.

GENTIANA NESOPHILA, Holm.

(Plate XIII, Fig. 6.)

Annual, glabrous : stem erect, angled, 6 to 9 cm. high, much branched from near the root : leaves glaucous, densely crowded and forming a rosette, roundish or obovate tapering into the petioles, the cauline spatulate or lanceolate, obtuse : peduncles many to 12, 1-flowered, with 2 or 3 pair of leaves : calyx (fig. K) glaucous and wholly glabrous, about $1\frac{1}{2}$ cm. long, unequally cleft to near the middle, 4-lobed, the longer lobes narrow and keeled, the shorter much broader with membranaceous margins, but not carinate : corolla (fig. L) pale bluish in dried specimens, 2 to $2\frac{1}{2}$ cm. long, 4-lobed, the lobes roundish with a very few lateral teeth, but no fringes, erosely denticulate across the summit, nectariferous glands 4 : stamens 4, with winged filaments : ovary (fig. M) shortly stipitate, the style distinct with a roundish stigma : mature capsule shorter than the corolla : seeds with short, obtuse papillæ.

Collected by Prof. John Macoun in low, moist ground near Salt Lake, Anticosti Island, Quebec; with flowers in August, 1883. The only known locality for this species.

These are the species which have been collected in Canada, and which were formerly supposed to represent Gunner's *G. serrata*. They are all very different from the plant we collected in the Rocky Mountains of Colorado, and of which we have, also, received some specimens from Wyoming through the kindness of Professor A. Nelson, who some years ago described it as *G. elegans*. It is more than probable that this species occurs, also, in the British provinces, thus we take the opportunity of presenting a diagnosis and an illustration of this excellent species in connection with the Canadian.

GENTIANA ELEGANS A. Nels.¹¹

(Plate XIV, Figs. 7 and 8.)

Annual, glabrous excepting the calyx, very robust: stem erect, angled, 20 to 40 cm. in height, branched from near the base: leaves forming a rosette, broadly spatulate, the upper lanceolate, obtuse: peduncles often numerous, until 20, erect, 1-flowered: calyx pale green with purple spots, about 3 cm. long, unequally cleft to the middle or below, the longer lobes narrower than the others, all with membranaceous margins and very sharp and prominent keels, scabrous only along the keels: corolla (figs. N and O) bluish to deep purplish, until 5 cm. in length, 4-lobed, the lobes very broad and veiny, erose across the summit, fringed along the sides: nectariferous glands 4: stamens 4, the filaments broadly winged, the anthers as in the preceding species at first introrse (fig. O), but later on extrorse (fig. N): ovary (fig. P) stipitate, the style distinct, but short, stigma (fig. Q) roundish and 4-lobed: mature capsule shorter than the corolla: seeds with short, obtuse papillæ.

Collected in Wyoming at 9—10,000 feet elevation and in Middle Colorado near Long's peak at 8,600 feet, where it grew abundantly in meadows in the Aspen Zone, with flowers in August.

It has, furthermore, been collected in Southern Colorado near Pagosa peak at 11,000 feet.

¹¹ Nelson Aven. New plants from Wyoming. (Bull. Torrey Bot. Club. Vol. 25, p. 276. 1898.)

Var. BREVICALYCINA Wettstein (*in litteris*).

Differs from the type by its much shorter calyx and by the very deep purple colour of the corolla, the lobes of which are denticulate, but destitute of fringes.

Collected in a swamp on Mt. Massive near Leadville, Colorado, at an elevation of 11,000 feet, near timber-line.

Among the other North American species, which by Gray were referred to *G. serrata* Gunn., are the two varieties: *grandis* and *holopetala*, none of which, however, are referable to this or any of the other species that occur in this country. They represent several vegetative and floral characters by which they appear to be distinct from all the others, and may consequently be considered as independent species: *G. holopetala* (Gray) and *G. grandis* (Gray).

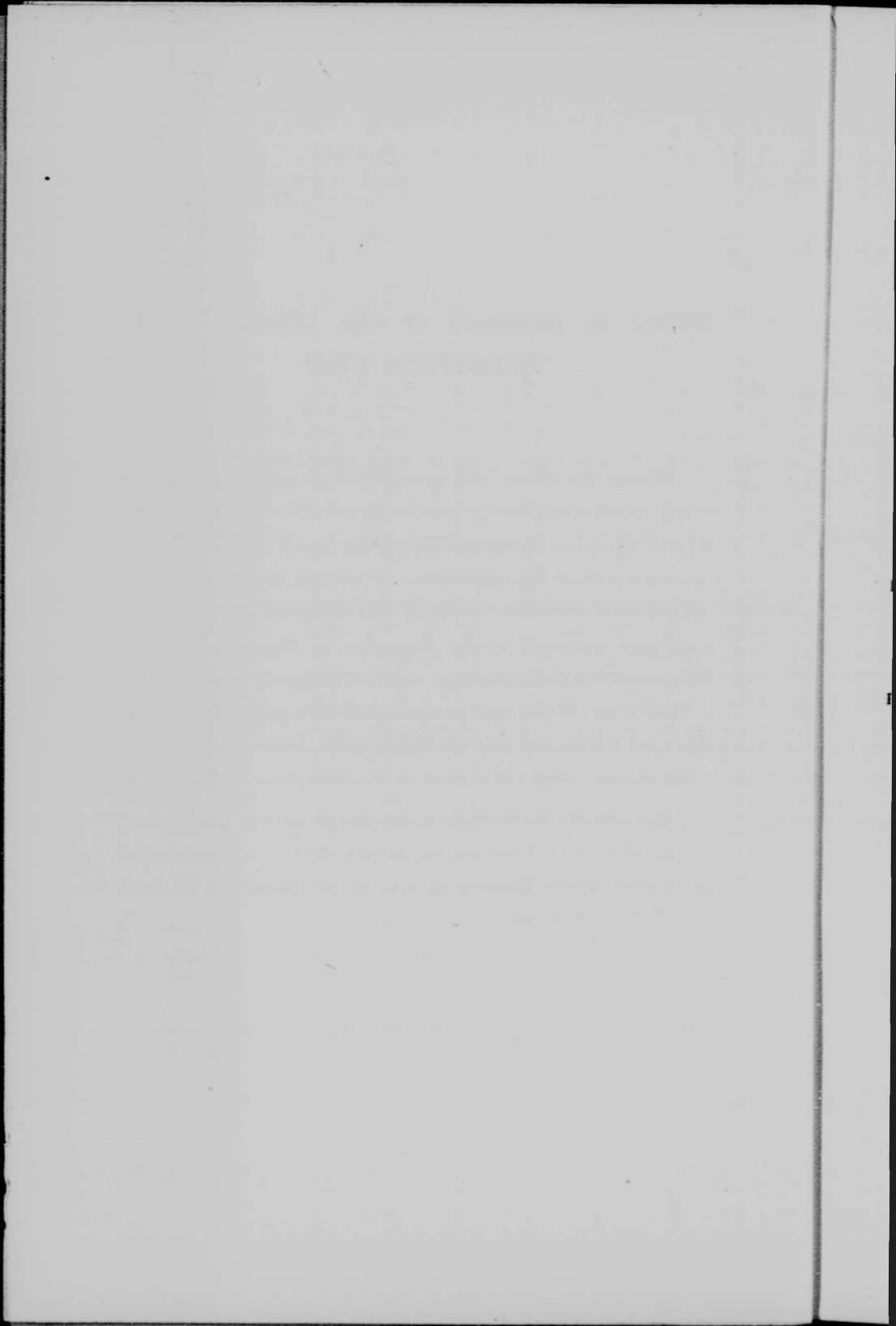
It would, thus, appear as if *G. serrata* Gunn. has not, so far, been collected in North America, judging from the collections, which have been examined, but we do not think it improbable that it may be found on this continent, since it occurs on the west-coast of Greenland; it should be looked for on the north-Atlantic coast in the immediate vicinity of the sea-shore and north of the arctic circle.

The American species, which we have described in the preceding pages, represent members of the section *Crossopetalæ* Frœl., to which *G. serrata* Gunn. belongs, but they exhibit a marked difference from this by the carinate calyx-lobes, the presence of nectaries and by the winged stamens; their habit is, also, somewhat different, if we consider *G. procera* and *G. nesophila*. Small, one-flowered specimens have been found of all these species, but such individuals do not deserve rank as even varieties. Their small size, lesser developed foliage and the single flower may depend on their development from poor seeds, on their occurrence in drier soil or, finally, on the fact that they are developed as root-shoots. Such root-shoots are not uncommon in *G. holopetala* and have, furthermore, been recorded as characteristic of the European *G. ciliata* L. in accordance with Irmisch.

Notice to members of the Ottawa Field-Naturalist's Club.

During the winter and spring months, papers read at the Club's Soirées are given precedence by the Editor of the OTTAWA NATURALIST when arranging MSS for the printer. This rule very frequently delays the publication of articles which, had they reached the hands of the Editor at this season of the year could have been published in the November or December number. Members of the Club who have notes or papers to be published in The OTTAWA NATURALIST will ensure the early publication of what they have written and save the Editor much embarrassment later in the season if they will at once send in their contributions.

The OTTAWA NATURALIST is intended to serve as the medium for the publication of the original work of the Club's members and no member should hesitate to send to the Editor any material suitable for publication.



EXPLANATION OF PLATES.

Plate XI.

- Fig. 1.—*Gentiana Macounii*, natural size.
Fig. 2.—Same, a small specimen, natural size.
Fig. A.—Calyx of same, laid open.
Fig. B.—Part of the corolla of same, laid open and showing the ciliate stamens and 2 nectaries at the base of the corolla-lobes.
Fig. C.—Pistil of same.
Fig. D.—Calyx of *G. serrata* Gunn., laid open.
Fig. E.—Part of the corolla of same, showing the slender filaments.
Fig. F.—Pistil of same.

Plate XII.

- Fig. 3.—*Gentiana procer*a, showing the habit, much reduced in size.
Fig. 4.—Same, the base of the stem and the roots, natural size.
Fig. 5.—Same, the flower, natural size.
Fig. G.—Calyx of same, laid open.
Fig. H.—Part of the corolla of same.
Fig. I.—Pistil of same.

Plate XIII.

- Fig. 6.—*Gentiana nesophila*, natural size.
Fig. K.—Calyx of same, laid open.
Fig. L.—Part of the corolla of same.
Fig. M.—Pistil of same.

Plate XIV.

- Fig. 7.—*Gentiana elegans*, the base of the stem with leaves and roots, natural size.
Fig. 8.—Flower of same, natural size.
Fig. N.—Part of the corolla of same.
Fig. O.—Part of the corolla of same, taken from a bud.
Fig. P.—Pistil of same.
Fig. Q.—Style and stigma of same.

AN AFRICAN DIPNOID FISH.

(Protopterus annectens.)

By ANDREW HALKETT.

In an issue of the *Fishing Gazette*¹ a paragraph appeared under the title, "Digging for Fish," of which the following is the substance :

"The natives of Kottiar, in Africa, are in the habit of digging every year, in the summer, the dry banks of the Vergel River for fish, which they dig out by hundreds, just as they would potatoes. The mud lumps are broken open, and the fish, perhaps eight or ten inches long, will always be found alive, and often frisky, as if just removed from its supposedly native element—the water. In the dry beds of several African rivers a similar practice is often pursued. A kind of mud fish buries itself while the bottom is still moist, and remains there all the summer, waking up when the rains begin again."

Preceding this paragraph were words to the effect that the above was "a new fish story," a bait, in fact, "to lure the unwary summer boarder to the swamps and sandhills of Suffolk County." But knowing better, I wrote to the editor of the *Gazette* corroborating the fact of the existence, during the dry season, of living fishes encased in capsules of mud awaiting the return of the rainy season when the pools and rivers are refilled with water. He published my letter² under the title, "The Dark Continent Fish," and the following quotation in full is its import :

"In regard to the 'new fish' 'credited to the Dark Continent' which appeared in your issue of January 7, under the title of 'Digging for Fish,' permit me the following space in your columns concerning a very remarkable group of fishes.

"These are the Dipnoids, distinguished from others by the possession of a rudimentary lung in addition to the ordinary gills. This lung is simply a modification of the air-bladder. The group contains four³ existing species, and several extinct ones. The names of the existing species are these :

"*Lepidosiren paradoxa*, a very rare fish of the River Amazon."⁴

¹ *The Fishing Gazette* [203 Broadway, N. Y.] Saturday, Jan. 7, 1899.

² *Ibid.*, Saturday, Feb. 4, 1899, p. 71.

³ During my visit in Great Britain I learned of a fifth (a recently discovered) Dipnoid, but am not yet in possession of any particulars about it.

⁴ "*Lepidosiren* has recently been found in abundance in swampy localities of the Chaco, Paraguay." Guide to the Galleries of Reptiles and Fishes, British Museum, 1898.

"*Ceratodus miolepis* and *C. forsteri*, from the rivers of Queensland, Australia.

"*Protopterus annectens*, from the rivers of tropical Africa.

"The species alluded to in your columns is the last mentioned, *Protopterus annectens*, of tropical Africa. This fish inhabits the rivers of that continent, and while it has sufficient water there is nothing extraordinary concerning its function of respiration, as it breathes just like other fishes, by gills; but during the dry season it encases itself in capsules of mud and mucus, and then breathes through its lung. While thus encased it can be transported alive to great distances, and when replaced in water the gills again assume their normal function.

"The Dipnoids are a sub-order of the Ganoids, to which the sturgeons and garpikes belong. I have seen sturgeons breathing atmospheric air by putting their snouts out of the water, and on examining a specimen of the garpike found an approach to a rudimentary lung, the air-bladder being cellular, thus revealing even in these North American fishes certain dipnoid characteristics.

"Petrified remains of other genera of Dipnoids are found in Devonian formation..."

Since the above was published I have been fortunate enough to see several living specimens of Dipnoids, during my visit some time ago to Great Britain. Two of *Ceratodus* in one of the aquaria of the Zoological Gardens, Regent's Park, London; and one of *Protopterus annectens* in the aquarium of the Liverpool Public Museum, which had been successfully transported from Africa in its mud-capsule. Furthermore, Dr. Forbes of the latter institution very kindly gave me a specimen of *Protopterus* also encased in its capsule, and which I brought with me across the Atlantic; with the intention of dissolving it, and liberating the fish on my arrival in Ottawa. So of late I have had additional incentives for prosecuting my studies of the Dipnoids.

The group receives its name from the double character of the respiratory organisation: these remarkable fishes breathing not only under water by gills, but at times, as has been stated in the letter to the *Gazette*, when the waters dry up, atmospheric air by rudimentary lungs. They belong to the Ganoid group of fishes, and are referable to three existing genera: *Ceratodus*, *Lepidosiren*, and *Protopterus*; and to a few extinct ones. The existing species differ exceedingly from other Ganoids in the character of the paired fins; there being in the pectorals and ventrals an axial skel-

eton, which is most fully developed in *Ceratodus*; these fins in *Lepidosiren* and *Protopterus* being filamentous. The tail, as in *Chimæras*, is diphyccercal; but in at least one extinct species: *Dipterus heliodus* the tail was heterocercal. The scales are cycloid, and in the several species they differ much in size. In general shape and character *Protopterus* approaches more closely to *Lepidosiren* than either do to *Ceratodus*. The scales in the two former genera are small, whilst those of the latter are very large. Again in the two former the vertical fin begins before the middle of the fish, and, as has been stated, the paired fins are converted into long filamentous organs; whilst in the latter the vertical fin begins behind the ventrals, which are placed of course as they are in all Ganoids abdominally, and the paired fins are proportionately shorter and paddle shaped.

Unfortunately the specimen of *Protopterus annectens*, and another for Prof. Ramsay Wright of Toronto University, which I brought from Liverpool did not survive; and on dissolving the capsule the former had all the appearance of having been dead for some time. However, after placing the dead fish for a short time in spirits diluted with water, I succeeded in sufficiently softening out the specimen so as to enable me to make an examination of its structure.

This species is elongated and compressed in shape. The gill-cleft and the eye are small. The filamentous pectorals and ventrals are fringed down the sides—the fringes according in plan with the rays of the verticle fin: which fin bears a multitude of close fitting rays throughout its length. Adjacent to the gill-cleft and immediately above the pectorals, there are branchial appendages. The scales, being small, are numerous, and embedded in the skin. Each jaw has a large tooth, a molar, with cusps.

The following recorded characters of structure, in this specimen were more or less obscure, owing to its shriveled condition. The lateral line runs nearly straight from the gill-cleft to the caudal portion of the vertical fin. There are two pairs of nostrils. The lung agrees with that of *Lepidosiren* in being "divided into lateral halves," and differs in that respect from *Ceratodus* in which genus the lung is single.

Previous to dissolving the capsule of mud, that object presented a hard and baked appearance, and had seemingly been firmly attached to the dried up bed of the river or pool in which the fish had previously carried on its gill-breathing function; and had been broken off by the collector. In this capsule the fish had coiled itself up: a circular opening communicating between its interior and the outer atmosphere, enabling the dipnoid to breathe. The opening was rounded at the entrance, and led inwards by a zig-zag channel. On dissolving the mud the capsule was found to be intermixed with vegetable fibres, which tended to support the capsule.

Protopterus annectens is said to attain a length of six feet.

BIRD MIGRATION. —A bird migration of exceptional magnitude was noticed by many people during the night of October 15th. Several smallpox guardians who were questioned by the writer informed him that birds had passed south in great numbers for several nights previous to the 15th, but that on that night there seemed to be millions of them. The writer's observation covered from about ten o'clock until nearly daylight, and during the whole of that time an unbroken stream of birds passed over the city at a very low altitude. Two distinct kinds of bird-note could be distinguished, one the chipping of small birds, the other the calls of plover, snipe, etc. It was this last sound which attracted general attention, but the other was just as distinct, and could be easily separated from the shorter call of the larger birds. All were probably waders. Doctor Oscar Klotz, who carefully noted the course of the birds, says that it was about southeast. The night was very cloudy and on that account the birds could fly at a low altitude without being seen.

J. M. M.

BRUE OR SOAP BERRY.

My attention has been directed to an article which recently appeared in one of the eastern papers headed "Where they eat soapsuds." Evidently the writer of the article in question was not well informed and it always seems to me a pity that people should publish any information of doubtful authenticity which if properly enquired into might really prove at least interesting if not of scientific importance.

The berry from which the so-called soapsuds are made is that of a shrub, botanically known as *Shepherdia Canadensis*, called by the French Canadians "Brue" and in the Chinook jargon "Soap Oolalie," i.e. Soap Berry, and from which latter name I presume the writer of the article has arrived at "Sapoliti," a term quite unknown in this province. I am not aware that it is used by the natives on festive occasions but it is used as a common article of food. It has really a very pleasant flavour and is relished by almost everyone when properly prepared. The mode of preparation is shortly as follows. The berries, if fresh, are strained through a cloth so as to separate the seeds from the juice and if dried they are first soaked and then strained. The juice is placed in a bowl, earthenware by preference, and sweetened with sugar, it is then beaten up either with a bunch of twigs or an egg-beater until it attains the consistency of ice-cream of a beautiful light pink colour, when it is fit for use.

From the fact that all utensils used in the preparation must be scrupulously clean and free from any taint of grease to ensure success, it is obvious that the remark that it is prepared "in a not over clean manner" is to say the least not strictly according to fact.

The brue berry is about the size of a red currant and generally of about the same colour, but many are of an orange colour. It has the peculiarity of being sweet, acid, bitter and aromatic all at the same time. To some people it is disagreeable but many acquire a liking for it both in its natural and prepared state.

Before concluding let me set another fairy tale at rest, viz, the use of a fish for light. I have no doubt the fish alluded to is the Oolahan or Oolachan which is about the size of a smelt, very fat and when dry it will burn for a time, but that it was ever used for a light

by the natives is purely a traveller's tale. In any case the fish is only obtained in some of the coast rivers, and therefore to the majority of interior indians it is unknown. Let me assure the readers of this short article that the time-honoured custom of a fire of wood on the floors of their abodes was the usual way of obtaining light and that now most of them use coal-oil lamps.

J. R. ANDERSON.

Victoria, B. C.

October 10th, 1901.

NOTE.—Mr. Anderson's statement regarding the use of the candle-fish may be true enough to-day when the labour of the west coast indians is utilized by the whites, and they are able to indulge in such luxuries as parafin candles and coal-oil lamps, but there can be no doubt that formerly the Oolachan was frequently used by these indians for lighting purposes. Writing in 1866 of this fish Lord says, in "The Naturalist in British Columbia," "It is next to impossible to broil or fry them, for they melt completely into oil. Some idea of their marvellous fatness may be gleaned from the fact that the natives use them as lamps for lighting their lodges. The fish, when dried, has a piece of rush-pith or a strip from the inner bark of the cypress-tree drawn through it, a long, round needle made of hardwood being used for the purpose; it is then lighted and burns steadily until consumed. I have read comfortably by its light; the candlestick, literally a stick for the candle, consists of wood split at one end, with the fish inserted in the cleft."

EDITOR.

NOTE ON SOME ERRATA IN THE REVIEW OF DR.
WHITEAVES' LIST OF EASTERN CANADIAN
INVERTEBRATES.

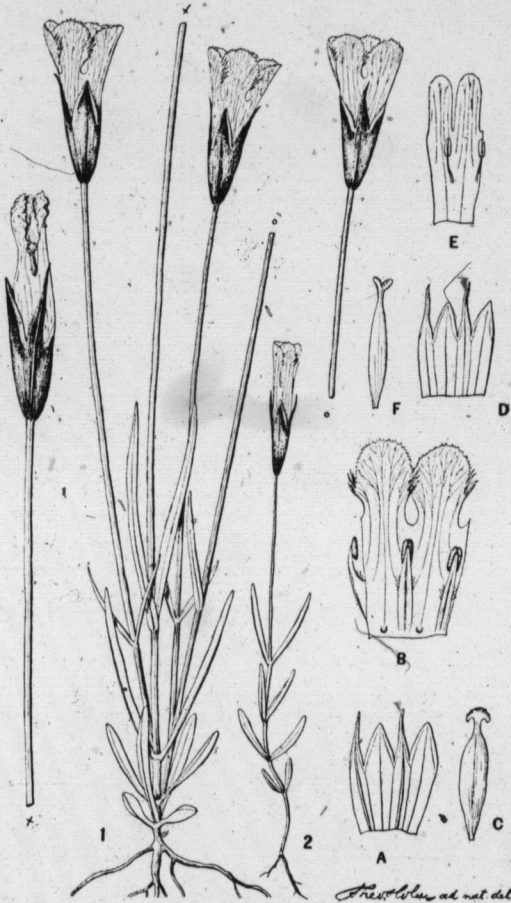
A number of errors, some very apparent others less so, appeared in the review of Dr. Whiteaves' Catalogue on pp. 165-172 of the October number of THE OTTAWA NATURALIST. Circumstances, which it is not necessary to detail, necessitated a very hurried reading of the first proof, and absence from Ottawa prevented a careful and thorough correction of the final proof, hence

some errors were no doubt unavoidable, though others it is more difficult to account for, especially such an obvious misprint as "Dr. J. W. Whiteaves," instead of the correct and familiar "Dr. J. F. Whiteaves," in the heading of the review. "Marine Worms" in large type on p. 167 requires elision, as also the figures 428, opposite the word "Brachiopoda." Canadian waters are rich in Invertebrates, but they would be a veritable zoological Eldorado if they harboured 428 species of Brachiopods. The actual number of Brachiopod species is 3, and the Polyzoa 115, the figures 3 and 115 being one line below their proper place. The 9th line, on page 170, states exactly the reverse of the fact and the sentence should end: "the Dog-whelk (*Purpura lapillus*, L.) arouses no such question." It is difficult to account for the statement in lines 20, 21, and 22, that *Litorina rudis* is recorded only for our more northern coast extending into Hudson Bay, unless it is due to the circumstance that the review was based on notes, made while reading Dr. Whiteaves' Catalogue, and the author's statement was overlooked that the species has a widespread abundance as well as a northern distribution. Happily these *errata* do not affect the reviewer's attempt to express the genuine feeling of appreciation with which the publication of the Catalogue will be regarded in scientific circles at home and abroad.

Readers will do well, however, to make note of the following errors in the review:—

- p. 165, line 5—"J. F. Whiteaves, LL.D.," &c., not "J. W. Whiteaves."
 p. 167, line 28—"Marine Worms" to be elided.
 " " 33—"3" not "428."
 " " 34—"115" not "3."
 " " 35—"115" to be elided.
 " " 43—After ARACHNIDA insert "(*Pycnogonida*)."
 p. 170 " 10—"arouses such," to read "arouses no such."
 " " 12—"litorca" not "literea."
 " " 22 and 23 to be elided and to read "not only for our more northern coast extending into Hudson Bay: but is abundant almost everywhere on rocks, sea-weeds, &c."
 p. 171, line 15—"spitsbergensis" not "spetsbergensis."
 " " 19—"Canadensis" not "Cauadensis."

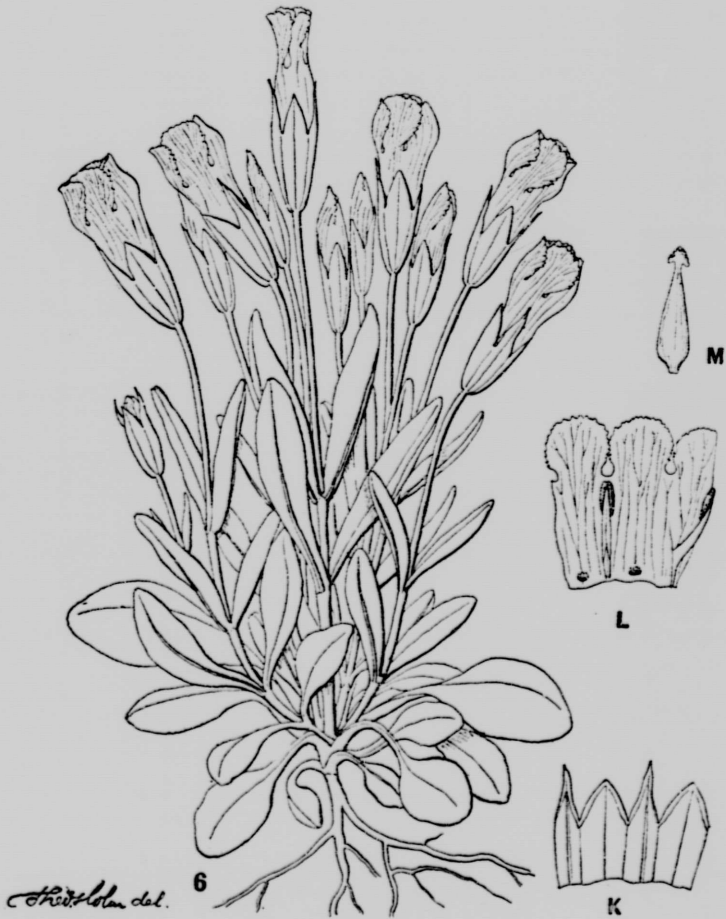
THE REVIEWER.



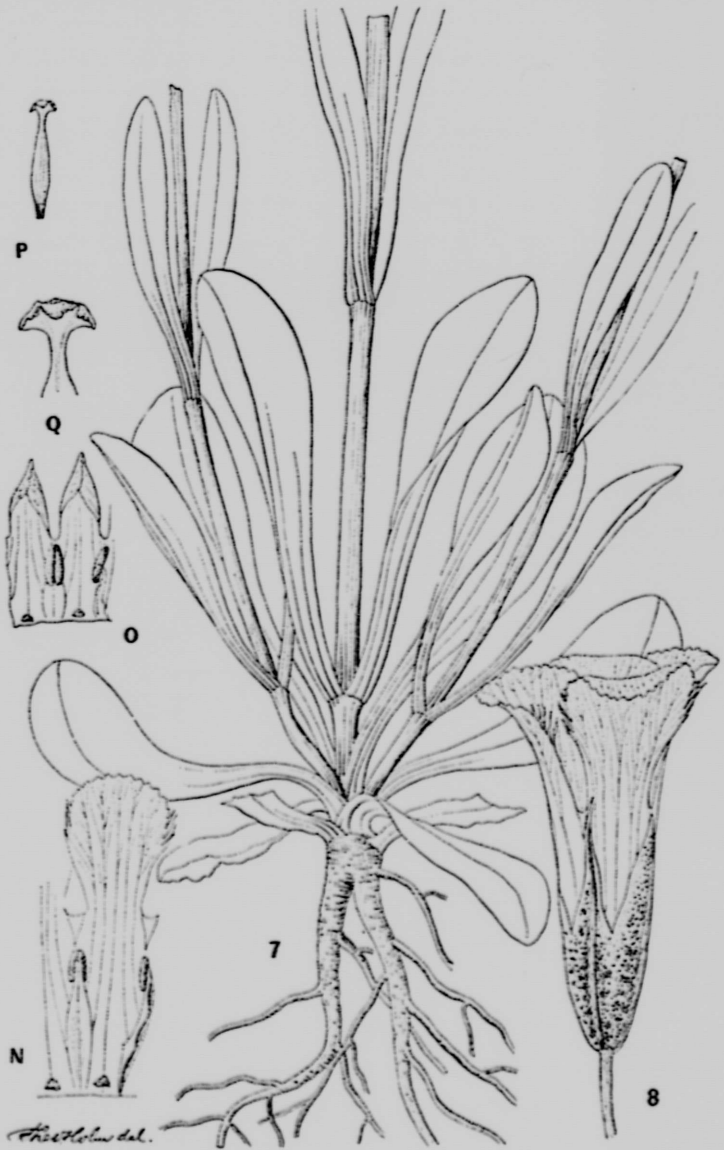
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