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Hunt Institute was dedicated in 1961 as the Rachel McMasters Miller Hunt Botanical Library, an international center for bibliographical research and service in the interests of botany and horticulture, as well as a center for the study of all aspects of the history of the plant sciences. By 1971 the Library's activities had so diversified that the name was changed to Hunt Institute for Botanical Documentation. Growth in collections and research projects led to the establishment of four programmatic departments: Archives, Art, Bibliography and the Library.

The mss. for first of the series -
Canadian willows of Sections *Pentandra*,
nigrae + *albae* was not found

W. A. Archer

June 1964

CANADIAN WILLOWS OF SECTION LONGIFOLIAE.

BY CARLETON R BALL.

Canada, Field-Naturalist
40: 117-129, 171-175
1926

This is the second paper in a series on the willows occurring in Canada. The first paper[✓] covered the sections Pentandrae, Nigrae, and Albae, the latter section containing only introduced species.

The present paper includes five species and three varieties of long-leaved willows which are known to occur in Canada. Of these, two species (argophylla and sessilifolia) and one variety (melanopsis bolanderiana) have been found only along the international boundary in the Rocky Mountain region. One species (exigua) and its variety (exigua lutescens) have been found as far as 100 to 150 miles north of the boundary. Two species and one variety (interior, interior pedicellata and melanopsis) range far northward.

Salix exigua lutescens seems not to have been definitely reported from Canada previously.

The abbreviations used to distinguish various herbaria are employed the same as those ~~used~~ in the previous paper.

✓ Ball, Carleton R. Canadian Willows of Sections Pentandrae,
Nigrae, and Albae. Canadian Field-Naturalist : 1926.

SECTION 3. LONGIFOLIAE

Shrubs 2-5 m. high, with densely caespitose stems and gray or light brown bark; branchlets slender, gray to dark brown or reddish, often lustrous; leaves linear to linear-lanceolate or elliptical, remotely denticulate or entire; petioles very short; stipules none; aments serotinous, terminating lateral leafy branches, the staminate often and the pistillate occasionally in pairs or threes; scales light yellow, deciduous; stamens 2, filaments hairy below; capsules glabrous to densely villous, 4-7 mm. long; styles none; stigmas short to 1 mm. long, divided. Leaves and capsules densely villous.

Blades lanceolate to broadly elliptical, gray; stigma lobes 1 mm. long, linear. 7. S. sessilifolia

Blades linear-oblongate, silvery, stigma lobes short. 8. S. argophylla

Leaves glabrate or merely short-pubescent (except in 9a); capsules glabrous (except Nos. 11 when young), stigmas short. ^{and 10a}

Branchlets brown to dark brown; blades oblongate or narrowly elliptical, denticulate; capsule 4-5 mm. long, subsessile. ^{10a and}

Blades glabrous or glabrate, green, often sub-laucescent beneath. 9. S. melanopsis

Blades more or less densely short-tomentose, gray. 9a. var. bolanderiana

Branchlets gray to reddish; blades narrowly to broadly linear.

Blades hairy, gray, opaque, 2-7 or 10 mm. wide; capsules 5-6 or 7 mm. long.

Blades short-pubescent, subentire; capsule subsessile. 10. S. exigua

Blades villous-pubescent, often spinulose-denticulate; capsule short-pedicelled. 10a. var. lutescens

Blades glabrous (or thinly villous when young), green, translucent, denticulate; capsule 7-9 mm. long, pedicellate.

Blades 5-12 mm. wide. 11. S. interior

Blades 2-6 mm. wide. 11a. var. pedicellata

The Longifoliae are a unique group, occurring only in North America. The linear, remotely denticulate, usually slender leaves, yellow deciduous scales, and short or obsolete styles are distinguishing characters. The aments not only appear after the leaves but oftentimes a second set appears in late summer. The clustering of the aments also is a striking feature. The species often are called "sandbar" willows because they soon occupy newly formed bars of river alluvium or sand. They are found along ~~watercourses~~, streams, ditches, and lake margins but never in swamps or stagnant water. Many can stand long periods of drought, provided that there is water from time to time. All but one of the 9 or 10 species occur in the mountains and deserts of western North America. Salix interior ranges from the Gulf of Mexico to beyond the Arctic Circle, and from the foothills of the Rocky Mountains to some of the States bordering the Atlantic Ocean.

7. Salix sessilifolia Nuttall

Salix sessilifolia Nuttall, Sylva 1: 68, 1843.

Salix macrostachya Nuttall, Sylva 1: 72, 1843.

This beautiful shrub with its relatively broad soft-hairy leaves was recognized for many years after Nuttall described it. Ball published a full description (Bot. Gaz. 60: 49-51, 1915). Later he made extensive collections of it in the Willamette and Umpqua Valleys in western Oregon. It occurs in river banks and in similar situations, usually well up toward high-water mark, from New Westminster, B. C., southward through the Puget Sound District of Washington, up the Willamette River and on at least the lower Umpqua River of Oregon. Its zonal distribution is Upper Sonoran and Transition.

John Macoun (Cat. Can. Bot. 1: 454, 1886) states only that it was

"Collected in the valley of the Fraser River, B. C. (Fletcher)". Henry (Fl. So. B. C. and Vanc. Id. 96, 1915) says: "New Westminster, not common."

Ball, in 1923 (in Abrams, Illus. Flora Pacific States 1: 491, fig. 1196) made the error of giving the locality as "Vancouver Island, British Columbia," whereas New Westminster is on the edge of the mainland.

The only specimen seen by the writer is that collected at New Westminster, B. C., by J. K. Henry 1421 (N) on Sept. 25, 1914 and June 9, 1915, which is typical. Both shoots bear young flowers. Schneider (Bot. Gaz. 67: 318, 1919) also discussed the Henry specimens as seen in the herbarium of the University of California. The species may be looked for at other points in the Vancouver and New Westminster Districts.

8. Salix argophylla Nuttall

Salix argophylla Nuttall, Flora 1: 71, pl. 20, 1843.

~~malacophylla~~
~~Salix macrostachya Nuttall, Sylva 1: 72, 1843. incl. (Spec. in few~~
~~and Gray Herbaria).~~

This is another striking species of the long-leaf willows. The linear-oblongate leaves are beautifully silvery sericeous on both sides and the plant is conspicuous amid the prevailing green of other vegetation. It occurs on stream banks in the Upper Sonoran zone from Washington and Oregon, east of the Cascades, eastward to northwestern Montana and south to northern Utah and Nevada. It crosses the line into Canada only in south-central British Columbia.

John Macoun (Cat. Can. Fl. 1: 450, 1886) confused this plant with the silvery-leaved phases of the common sandbar willow, S. interior Rowlee (S. longifolia Muhl.), discussed later. All of his citations refer to that species or to S. melanopsis. Henry (Fl. So. B. C. 96, 1915) says: "Common east of the Cascades." Under S. macrostachya (usually considered synonymous with S. sessilifolia) he says: "Kettle River; Koksilah, V. I." It seems probable that the Kettle River plant was really S. argophylla which had been determined as "macrostachya". Piper* also cited specimens

* As this is written, Feb. 12, 1926, comes the sad news of the death of Dr. Piper on Feb. 11. C.R.B.

of argophylla under the name macrostachya (Contr. U.S. Nat. Herb. (Fl. Washn.) 11: 214, 1906), as Schneider has pointed out (Bot. Gas. 67: 325-326, 1919). Piper gives no Canadian distribution and Schneider cites only the one given below.

The only Canadian specimen seen by the writer which unquestionably is referable to this species is J. M. Macoun 68128 (N) collected on June 26, 1902, by the Kettle River at Cascade, B. C., on the international boundary in southern ^{aste} Yale District. The species is likely to occur elsewhere in the Columbia Valley of British Columbia, which is in the Upper Sonoran zone. There also is another specimen in the U. S. National Herbarium collected by J. Macoun, No. 24 (N), in June, 1890, at Deer Park, southern Kootenay District, B. C., which is puzzling. One shoot has a pubescent stem and broad leaves approaching those of sessilifolia. The other shoot is bluish pruinose with linear-oblongate leaves like those of argophylla. The pruinose twig indicates a hybrid with subcoerulea or bella.

9. Salix melanopsis Nuttall. Dusky Willow.

Salix melanopsis Nutt. Sylva 1: 78, pl. 21, 1843.

This well marked species, collected first by Nuttall near old Ft. Hall on the Snake River in southeastern Idaho, remained long unrecognized by botanists, as did also sessilifolia. Specimens could be found under many different names in herbaria. Its dark twigs and dark green leaves give a color effect which well deserves the specific name.

In the United States it ranges from northeastern Utah and the western parts of Wyoming and Montana westward to Washington, Oregon and California. It occurs in the same situations as other members of the section, in the Upper Sonoran and Transition zones. Its Canadian distribution is the northward extension of that in Montana, Idaho and Washington.

John Macoun (Cat. Can. Fl. 1: 444-455, 1886; 2: 356-361, 1890) does not mention it. Piper (Fl. Washn. 213, 1906) includes British Columbia in its range. Ball (in Coulter & Nelson, New Man. Rocky Mtn. Bot. 131, 1908) says: "British Columbia as far east as the Selkirks." Henry (Fl. So. B. C. 97, 1915) cites: "Columbia Valley, Revelstoke." Rydberg in 1917 (Fl. Rocky Mtns., 192) includes "B.C." in its range. Schneider (Bot. Gaz. 67: 337, 1919) states that its range includes:

"Alberta (Crow Nest Pass and Jasper), where it seems to reach its northern limit at about the 53rd parallel, British Columbia (in the Chilliwack Valley and at Revelstoke), * * *."

The writer has examined specimens representing the species from the following localities:

SASKATCHEWAN: Eye Hill Creek (G. T. P. Ry.) Maccoun and Herriot 70287 (B), Aug. 8, 1906 (sub nomen S. fluviatilis; the leaves are small, linear-oblongate, glaucescent beneath and nearly entire but clearly melanopsis).

ALBERTA: Pincher Creek, 3700 ft. elev., Malte and Watson 60 (116734, form with very narrow, somewhat spinulose leaves), 61 (116735) June 6 and 27, 1925 (B,O). Waterton Lakes Park, 4500 ft. elev., Malte and Watson 168 (116741), June 9 and Sept. 10, 1925 (B,O); 4200 ft. elev., Malte and Watson 256 (116758), 259 (116761, broad short leaves), June 10-12 and Sept. 10, 1925 (B,O); along Blakiston Brook, 4400 ft. elev., Malte and Watson 408 (116768) June 16, 1925 (B,O). The Gap, Crow's Nest Pass, Rocky Mts., J. Maccoun 94442 (B,O), Aug. 14, 1897. Rocky Mountains Park, east end, on Ghost River, N. B. Sanson 822, 825 (RM), 824 (B, RM), July 18, 1921. Jasper Park, along Athabaska R. near Jasper, J. M. Maccoun 95386 (B), 1917.

BRITISH COLUMBIA: Field, alt. 4064 ft., Edith M. Farr (B), July 12, 1904; Emerald Lake near Field, Farr 891, 892 (B), July 17, 1905. Yale District, within 5 miles of Lillooet, Cascade Range, alt. 1000 ft., J. M. Maccoun 97792 (B,O), July 3, 1916 (leaves slightly pubescent). Cassiar District, Stikine River, 70 miles from mouth, Preble and Mixter 504 (H), July 9, 1910.

Salix melanopsis bolanderiana (Rowlee) Schneider.

Salix bolanderiana Rowlee, Bull. Torr. Bot. Club 27: 257, pl. ⁹/₁ fig. 12, 1900.

Salix melanopsis bolanderiana (Rowlee) Schneider, Bot. Gaz. 67: 338, 1919.

Rowlee separated melanopsis from bolanderiana in his key (p. 248) by describing the former as having "Leaves distinctly glaucous and prominently veiny beneath" and the latter as having "Leaves not distinctly glaucous nor veiny beneath." Schneider says (p. 339) that this is not correct. Leaves of S. melanopsis usually are more or less glaucescent beneath at and after maturity but not before. On many specimens they are not conspicuously veiny at any stage of development. The type specimen of melanopsis is immature and does not show either character.

Schneider separates the species in his key (p. 314) by ascribing longer leaves, wider aments and longer capsules to bolanderiana. The type does not show these characters, however, and at best they are variations of degree and not of kind. The best character for separating the two is one which Schneider himself points out in both key (p. 314) and text (p. 339) but which Rowlee does not mention. The type specimen of S. bolanderiana (Bolander 4958, Yosemite Park, Calif.) is somewhat pubescent on both surfaces of the leaves but especially beneath. The writer used this character in separating this form as a variety of melanopsis (Abrams, Illus. Fl. Pac. States, 493, 1923).

In its extreme form the leaves are fairly densely pubescent-tomentose on both sides. This form is fairly common in eastern Washington, northern Idaho (Priest Lake district) and northwest Montana (Flathead Co., in and around Glacier National Park). The only Canadian specimen seen by the writer which matches these is one collected in Kootenay District, B. C., Deer Park, Lower Arrow Lake, J. Macoun 23 (F. sheet 6522), June 10, 1890 (the leaves entire). Some other specimens from British Columbia and Alberta show slight pubescence but they are recognized under melanopsis, at least until fuller study can be made.

10. Salix exigua Nuttall

Salix exigua Nuttall, Sylva 1; 75. 1843.

Salix longifolia exigua (Nutt.) Bebb, Willows Calif. (Pre-printed from S. Wats. Bot. Calif. 2; 85) 1879.

Salix fluviatilis exigua (Nutt.) Sarg. Silva N. Am. 9; 124, 1896 (in part).

"Salix longifolia" of many authors dealing with western species, not Muhl.

Salix exigua is the common gray shrubby willow of the region from the eastern slope of the Rocky Mountains to the eastern slope of the Sierra-Cascade Range. It occurs abundantly along ditch banks and stream margins and in low ground up to 6,000 ft. elevation in the Upper Sonoran and Transition zones. Several varieties are recognized, with somewhat overlapping ranges.

It has not been generally recognized as occurring in Canada.

Neither J. Macoun (Cat. Can. Fl. 1; 444-455, 1886; 2; 356-361, 1890) nor Henry (Fl. Sc. B. C. 95-101, 1915) mention it. Piper (Fl. Washn. 213-214, 1906) does not include Canada in the range. Rydberg (Fl. Rocky Mtns. & Adjac. Fl. 172, 1917) includes British Columbia and Saskatchewan in the range. Schneider (Bot. Gaz. 67; 330, 1919) says:

"The range of what I call the typical form of S. exigua extends * * * northward to British Columbia (where I did not see it from farther north and west than Clinton on the Fraser River) and southern Alberta (Medicine Hat), * * *."

but unfortunately he does not cite the specimens on which this extreme northern distribution is based.

Ball (in Abrams, Illus. Fl. Pac. St. 493, 1923) says: "Fraser River in British Columbia southward, * * * and east to Alberta." This was based on the above statement by Schneider. The writer believes that both Rydberg and Schneider probably confused exigua with the narrow-leaved S. interior pedicellata discussed below.

East of the Continental Divide in the United States exigua occurs sparingly as far north as northern Montana and possibly may be found in southern Alberta also. However, the extensive collections of the Macouns, N. B. Sanson, and Malte and Watson, so far as the writer has studied them, do not reveal the presence of the typical exigua in Alberta. He has seen only the one Canadian specimen, cited below, which can be referred certainly to this species.

BRITISH COLUMBIA: Shuswap, in Yale District, N. B. Sanson 614

(RM), July 4, 1916.

10a. Salix exigua lutescens (Rydb.) Schneider

Salix lutescens Rydb. in Britton, Man. Fl. No. U. S. and
Can. 316. 1901.

Salix exigua lutescens (Rydb.) Schneider, Bot. Gaz. 67: 334,
April, 1919.

The name was applied by Rydb. to a plant from Banner County in western Nebraska, having leaves "permanently yellowish silky." It occurs in Colorado, Nebraska, and South Dakota but has never before been reported from Canada, although Rydb. gave the range as "On sandbars, Saskatch., and Br. Col. to Neb., Ind. Terr. (Okla.), and Ariz." Evidently several different forms were covered by the description and distribution given. The Oklahoma material and that from Saskatchewan represent S. interior (longifolia). That from Arizona was another variety of exigua. The British Columbia specimen is unknown to the writer unless it is one collected by Shaw and cited below. There remained the plants of the east-central Rocky Mountain area to which this name properly may be applied.

A large collection of willows made in southwestern Alberta in 1925 by Dr. M. O. Malte, Dominion Botanist, of the Victoria Memorial Museum, and his assistant, Mr. W. R. Watson, was presented to the writer. A study of this material revealed seven specimens referable to this variety. Six are from Fincher Creek, in the extreme southwestern corner of the Province and one is from Calgary, farther north. They differ somewhat from the material of Colorado and adjacent States in having ^{cn}larger leaves, with the margins more spinulose-denticulate, and the capsules short-pedicellate rather than sessile. The spinulose denticulation of the leaf margins is even more strikingly exhibited by the British Columbia specimen.

The following is the material referred here:

ALBERTA. Pincher Creek, 3700 ft. elev., Malte and Watson, 57, 57a, 58, 59 (116730-733) June 6 and 27, 1925 (B,O); gravelly creek bottom, 3700 ft. elev., Malte and Watson 660, 661 (116789-90), June 27, 1925 (B,O). Calgary, Bow R. at Bowness Park, 3500 ft. elev., Malte and Watson 1291 (116853), July 16, 1925 (B,O).

BRITISH COLUMBIA. Flood-plain of the Columbia River at Beaver-mouth, alt. 2400 ft., C. H. Shaw 1179, April 18, 1905 (N). (The slender silvery pilose leaves bear numerous long spinulose teeth).

11. Salix interior Rowlee. Sandbar Willow.

Salix interior Rowlee, Ball. Torr. Bot. Club 27: 253, pl. 9, figs.

12, 13. 1900.

Salix longifolia Muhlenberg, Neue Schrift. Gesellsch. Naturfor. Fr.

Berlin 4: 238, pl. 6, fig. 6, 1803; not Lamarck.

Salix fluviatilis as understood by Ball (in Coulter & Nelson New Man. Rocky Mtn. Bot. 131, 1908) and other authors, not Nuttall.

The Sandbar Willow is widely distributed from the Gulf of Mexico in Louisiana to Yukon Territory and from the eastern edge of the Rocky Mountains to the District of Columbia, Delaware, New Hampshire and New Brunswick. No other species of the section Longifoliae is found in this large area. It occurs along ditches, streams and lake margins but never in swamps. It is one of the first plants to appear on sandbars or newly formed alluvium, usually being succeeded by poplars. It forms thickets rather than clumps.

John Macoun (Cat. Can. Pl. 1: 450, 1886) recognized its wide distribution in Canada from near Quebec to the Rocky Mountains and north to northern British Columbia and the Mackenzie River. No additional notes are given in the "Additions" (ibid 2: 356-361, 1900). Fernald (in Gray's New Man. Bot. 323, 1908) says: "E. Que. to Man." Rydberg (Fl. Rocky Mtns. & Adjac. Pl. 192, 1917) says: "Que. * * * Sask.", but he regards S. exigua as occurring in Canada from Saskatchewan to British Columbia. He confuses exigua and the narrow-leaved variety, S. interior pedicellata, which occurs throughout the western portion of the Great Plains area of the United States and Canada.

Schneider (Bot. Gaz. 67: 341-42, 1919) says:

"The northern border line of the range of S. longifolia and var. pedicellata is not yet exactly known. Approximately it seems to run in the west from Fairbanks in Alaska to Fort Simpson in the Northwest Territories and through the Athabasca Plains and central (or southern?) Manitoba and southern Ontario to the south of James Bay and to about Lake St. Johns in Quebec, from where the eastern line turns southeast to western New Brunswick (Woodstock, Pokiok) and then southward to New Hampshire along the Connecticut River."

As this species is so well marked and so widely distributed, it seems unnecessary to cite numerous specimens in full. The writer has seen material from NEW BRUNSWICK (St. Johns R., York Co., Fernald & Pease 24985); QUEBEC (Ottawa R. near Aylmer, Malte 111736, 111815); ONTARIO (Chatham, J. Macoun 26894; sand banks, Lake Ontario, J. Macoun 36, Aug. 17, 1878); MANITOBA (Portage la Prairie and McGregor); SASKATCHEWAN (Banks of South Saskatchewan River, ferry landing, northwest of Swift Current, Ball 2319 (B), 1925; east bank So. Saskatchewan R., Saskatoon, Ball 2325 (B), 1925; east bank of So. Saskatchewan R., near Batoche, Ball 2327 (B), 1925); ALBERTA (Lethbridge, Exshaw, Calgary; Ft. McMurray on the Athabaska, Preble & Preble 181); MACKENZIE (Slave River, R. Kennicott, 1860; mouth of Nahanni R., Preble 362, July 24, 1904); YUKON (Klondike R., at Dawson, Hitchcock, 1909).

John Macoun (Cat. Can. Pl. 1: 450, 1886) also recognized a variety argyrophylla Andersson, giving as a synonym S. argophylla Nuttall. The latter is a very different species from the Columbia River Basin and Andersson's variety chiefly represents young shoots of interior, which are normally sericeus. Schneider (Bot. Gaz. 67: 342-44, 1919) has included much of the same material under S. longifolia wheeleri (Rowlee) Schn. The writer believes that Schneider greatly misunderstood Rowlee's variety.

lla. Salix interior pedicellata (Andersson) n. comb.

Salix longifolia pedicellata Anders. Svensk. Vetensk. Akad. Handl.
(Monog. Sal.) 6: 55, 1867).

Salix rubra Rich. in Franklin, Marr. Journ. Polar Sea, App. 752, 1823.

Salix linearifolia Rydberg in Britt. Man. Fl. No. United States and
Canada 316, 1901.

This variety is distinguished by relatively narrow leaves, similar to those of exigua in size and shape. The pedicels are not long, as the name seems to indicate, but possibly average longer than those of the typical form of the species. It occurs in the higher drier plains east of the Rocky Mountains from Kansas and Wyoming to Alberta, Saskatchewan and Manitoba, and north (according to Schneider) to Alaska, Yukon, and Mackenzie Territories. The writer is inclined to believe that the far northern material more nearly represents the species than the variety.

The following Canadian specimens, representing the variety, have

been examined by the writer:

MANITOBA: Brandon, J. Fowler (N), July 7, 1887.

SASKATCHEWAN: Assiniboine River, J. Macoun 10 (N), June 16, 1879;
20 miles west of Yorkton, Macoun and Herriot 70288 (B), 1906.

ALBERTA: Calgary, J. Macoun 94329 (B), 1897; Bow River at Calgary,
3400 ft. elev., Malte and Watson 23 (116729) June 4, 1925 (B); Elbow
River, 3200 ft. elev., Malte and Watson 2 (116719), June 3, 1925 (B,O);
Athabaska delta, 9 miles above the mouth, Laing 42, 49 (B), 15-18 ft.
high, 1920.

February 16, 1926.

Dr. M. O. Malte,
Victoria Memorial Museum,
Ottawa, Ontario, Canada.

Dear Doctor Malte:

Under separate cover I am sending you a carbon copy of a paper entitled "Canadian Willows of Sections Pentandrae, Nigrae, Albae, and Longifoliae." For a long time I have been intending to study and map the distribution of willow species in Canada, in order that I might have a clear mental picture of the range of the different species. When I started on the task it struck me that it might well be worth while to prepare the material for publication for the use of Canadian botanists. This paper is the result of that idea. As the title states, it covers the first three sections of native species and the section Albae covers the three commonly introduced species.

As you will note from the manuscript, I have given a description of the section and made a key to the species of each section. These keys are based primarily on foliage characters, in order that specimens without flowers or fruit may be determined. I have used fruit characters in the keys but not alone by themselves. I believe that keys based on vegetative characters are more likely to be used by amateurs also, then are the more technical keys based primarily on flower characters, in the case of plants like the willows which have inconspicuous flowers. After that, I have given some notes on the section as a whole.

For each species known to occur in Canada, I have discussed the habitat and range, cited some of the more important catalogues and manuals covering Canadian botany, and listed herbarium specimens which I have examined.

I will be very glad to have your ^{be} action as to the value of this sort of treatment for Canadian botanists. I had in mind sending ~~the~~ paper to the Ottawa Naturalist for publication. This will be the first of a series. This particular paper does not contain any new varieties or species and only one new combination. When I come to work up sections containing little known species, I probably would include a rather full description and, in the case of new species or varieties, both a description and a discussion of relationships would be inserted.

The next important question is whether I should obtain material from the herbarium at Ottawa for study before publishing these papers. In some cases I would surely wish to do this in order to get a better understanding of the limits of variation in the species. Probably it ought to be done in order to get a fuller knowledge of the geographical distribution of each species.

I will be glad to have you look the paper over from this point of view and see if you think the sending of Canadian material would be likely to extend the range of these species, as I have indicated it.

You are at liberty to keep this copy of the paper. Any suggestions you feel able to make will be greatly appreciated.

With kind personal regards, I am

Very sincerely yours,

Carleton R. Ball,
Senior Agronomist in Charge.

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CRB/LJM

P. S.

I am enclosing an extra page giving the interpretation of the abbreviations used to designate herbaria.

Am I *right* in my understanding that all the botanical collections of the Canadian Government are together in one herbarium in the Victoria Memorial Museum, just as all our collections are in the National Herbarium? If not, will you be good enough to tell me the name, location, and scope of the different Government herbaria in Ottawa.

The unit is a collection of Can spec

3814 Jocelyn St., N.W.

Aug. 7, 1926.

Dr. M.O. Malte,
Victoria Memorial Museum,
Ottawa, Ont., Can.

Dear Dr. Malte:-

Your letter of June 5 came just after I left for a two-months field trip in the Mid-west. I am glad that you found the complete list of determinations of some interest. The willows are not such a bad lot after one knows them a bit. If I can help toward the knowing I shall be glad.

I really want to get down and monograph the genus in North America but I find so little time for botany. However, each paper I put out is a further preparation for the final labor, either in determining and recording ranges more fully and accurately, or in recognizing and describing the species more fully.

I intend to go ahead on the series of Canadian papers of which I wrote, as I must get the Canadian distribution in mind, and a record of all species which occur.

I hope you have had a fine summer of collecting in New Brunswick. It is a most interesting ecological area. I had hoped to be able to drive north after returning from my field trip but had to drop out in Michigan and return here for an operation, from which I am about recovered.

With kind personal regards,

Very sincerely,

August 31, 1926.

Dr. M. O. Malte,
Victoria Memorial Museum,
Ottawa, Ont., Canada.

Dear Doctor Malte:

On returning from a long field trip in the Middle West I have been enabled to finish the paper on Canadian willows, of which I sent you a carbon copy some months ago. I enclose herewith several more pages which have been rewritten, either to improve the statements made or to add additional data based on your Alberta collections of 1925. Please substitute these for the pages in the copy previously sent you.

Page 2b containing herbarium designations is new.

Pages 38b and 38c contain my discussion of Salix exigua luteo-sericea based on your material. I expect to send the paper forward for publication today.

With kind personal regards, I am

Very sincerely yours,

Carleton R. Ball

CRB/AJM

ENC.



DEPARTMENT OF MINES



VICTORIA MEMORIAL MUSEUM

Ottawa, Ont., Oct. 27th, 1926.

Dr. Carleton R. Ball,
Senior Agronomist in Charge,
Bureau of Plant Industry,
U.S. Dept. of Agriculture,
Washington, D.C., U.S.A.

Dear Dr. Ball:-

I received the galley proof of your paper on Canadian willows from the Editor of the Canadian Field Naturalist the day before yesterday and have read it with great interest. I am sure it will be welcomed by the botanists in Canada as well as in the United States. I am enclosing the proof, as I have corrected it, for your approval. As you see, I have made quite a few changes, most of which are self-explanatory. A couple, however, require a few words of explanation.

Thus I notice that you have quoted Macoun's Catalogue of Canadian Plants: "1, 1886, and 2, 1890," Now, Macoun's Catalogue was not issued in Volumes but in Parts, although the consecutive pagination of the first three parts might indicate the former mode of issue. Under the circumstances, I believe it would be better to change

Recd



VICTORIA MEMORIAL MUSEUM

your references to Macoun's Catalogue so as to conform with the way it was actually issued. I have, therefore changed "I" to III and "2" to V, the "III" and "V" referring to parts of the Catalogue.

In the fourth paragraph from the beginning you say: "Where there is a separate collection number, the serial number is given afterwards in parentheses with the initials "G.S.C." prefixed." And a little further down you use the abbreviation "O" for the herbarium in the Victoria Memorial Museum at Ottawa. I would call your attention to the fact that the herbarium of the Geological Survey of Canada and the herbarium in the Victoria Memorial Museum are the same thing. The herbarium was for a long time known as the herbarium of the Geological Survey but when, in 1921, I succeeded the late Mr. J. M. Macoun, I was appointed Chief Botanist, National Herbarium of Canada. From that time all our labels, as you no doubt have noticed, have "National Herbarium of Canada" printed on them. Hence I have changed your references to the herbarium in the galley proof accordingly.



VICTORIA MEMORIAL MUSEUM

Re distribution of Salix nigra: Perhaps it might be in order to add a sentence re its alleged distribution in western Canada as suggested in the galley proof, or perhaps a little more elaborated, if you think it advisable. We have a sheet, which I am sending you under separate cover, from Maple Creek, Sask., No.24241, collector J.M. Macoun, May 29th, 1884, which is labelled "Salix lutea Nutt. = nigra Hook." This is very likely the specimen upon which Macoun based his statement that S. nigra occurs in the "valley of Maple Creek, N.W.T." It is, I take it, S. lutea. Please return it at your convenience.

Please return the galley proof at your earliest convenience. As soon as I get it back I will take it personally to the printer and explain how the keys should be set up

Yours very truly,

M. Moench

Chief Botanist, National Herbarium.



CANADA

VICTORIA MEMORIAL MUSEUM

Ottawa, Ont.. Nov. 4th, 1926.

Dr. Carleton R. Ball,
Cerealist, U.S. Dept. of Agriculture,
3814 Jocelyn St.,
Washington, D.C.

Dear Dr. Ball:-

I received your letter of Nov. 1st, together with the galley proof of your Salix paper, today and have corrected the latter in accordance with your wishes.

Re citation of Macoun's Catalogue, I beg to explain that I made the references to the various parts in accordance with W. F. Ferrier, who in "Annotated Catalogue of and Guide to the Publications of the Geological ^{Survey} of Canada 1845-1917; Ottawa 1920, p. 163" lists Macoun's Catalogue in parts, without mentioning volumes at all. It is quite true, as you say, that Macoun in the preface to Pt. IV states that Parts I-III constitute the first volume of the Catalogue, but that statement apparently does not make them a volume in the eyes of a bibliographer, as there is nothing on their title pages to indicate that they were parts of a volume. Furthermore, if Parts IV and V are cited as parts of volume 2, one might ask: "where are Parts I-III of

volume 2?". However, I have corrected the galley proof in accordance with your wish.

With reference to what you say, in the third paragraph on page 3 of your letter of Nov. 1st, about the identity of the so-called S. nigra from Maple Creek, Saskatchewan, I am afraid that, after a discovery which I made today, the question is getting a little more complicated than I thought at first. I found that, besides the specimen, No. 24241, which I sent you recently, we have two more sheets labelled S. nigra from Maple Creek, Saskatchewan. They were in the S. amygdaloides wrapper. One is No. 24239, collected by J.M. Macoun, May 29, 1884, and the other is No. ⁴24240, collected by Dawson, June 6, 1883. The former seems to be S. amygdaloides. Please note that Macoun 1 (3) p. 451 quotes both Dawson and J. M. Macoun as collectors of S. amygdaloides at Maple Creek. I am sending the specimens to you under separate cover.

Under the distribution of S. amygdaloides you give "Saskatchewan: "Northwest Territories", Maple Creek, J.M. Macoun (F), May 29, 1884". Perhaps this specimen in the herbarium of the Field Museum of Chicago is a duplicate of our No. 24239, If that is so, the record for Maple Creek is O.K., provided of course that No. 24239, as I surmise, is really S. amygdaloides. If it is amygdaloides, perhaps it would be advisable to cite it. I, therefore let the record stand until I have heard further from you.

As, however, at least one of the sheets labelled S. nigra,

Digitized by Hunt Institute for Botanical Documentation

OK
Insert
24239
+ "O" for
Macoun

is undoubtedly S. lutea, and another one may turn out to be S. amygdaloides, it might be well to insert a statement regarding the identity of the three sheets from Maple Creek under S. nigra. This can be done in the revise which I will ask the printer for.

I am taking the proof to the printer this afternoon and will arrange to have the keys set up as you wish.

Yours sincerely,

M. O. Walte

Chief Botanist National Herbarium.

November 1, 1926.

Dr. M. O. Malte,
Victoria Memorial Museum,
Ottawa, Ont., Canada.

Dear Doctor Malte;

Yours of October 27 and corrected galley proof of my paper received. I am greatly indebted to you for the careful reading. Probably you have caught some things I missed, but I cannot be sure as I have already returned the proof sent me by Prof. Miller.

In regard to Macoun's Catalogue of Canadian Plants, I would note as follows:)

The fact that the parts comprising each volume are paged consecutively and have a common index is fairly good proof that their author regarded them as volumes 1 and 2. To make assurance doubly sure, you will find on reading the prefaces to parts 4 and 5 that Macoun himself described his work as comprising volumes 1 and 2. I feel, therefore, that the references to volumes 1 and 2 should remain as they were in the manuscript.

However, as the separate parts of each volume bear different dates, it probably will be better to recognize the number of the part as well as the number of the volume. If this is done, I would prefer to follow the form adopted by Biological Abstracts and other journals and use arabic rather than Roman numerals, and to place them in parentheses immediately after the volume number, thus "Cat. Can. Pl. 1 (3):". By the way, ~~not~~ changing my volume designations, you missed the second one in the second paragraph of the text under lasianandra lancifolia.

I already had suggested to Prof. Miller, when returning the proof, that there should be a wider space above the center heads and had approved the suggestion to set the center heads in bold-face type.

I am glad that you have changed the reference to "G.S.C." numbers. This will make for a better understanding and will simplify things considerably.

In galley 1, just before the list of abbreviations for herbaria, you change the word "parentheses" to "parenthesis". If you consult dictionaries, I think you will find the plural form approved and used fully as commonly as the singular.

In regard to writing Latin names of species and varieties derived from proper names, I much prefer to use lower case initials. I have done this consistently for many years unless the practice of the journal was distinctly and unalterably otherwise. I would like, therefore, to have lower case initials used in this series of papers unless the editorial requirements of the Canadian Field Naturalist are to the contrary. I note, by the way, that you did not catch the variety abramsi, near the bottom of galley 4.

On galley 4, in the Alberta specimens of caudata parvifolia, please delete the "m" following Sanson's No. 164. Sanson used letters rather commonly as subnumbers, but always used capitals. His No. 164 has no letter following it.

On my copy of the proof I already had deleted my former statement that the Maple Creek locality was unknown to me and had inserted "southeastern Saskatchewan", as you have done.

You did well to correct my preference to J. M. Macoun in galleys 5 and 6. I don't understand where I got any reason for referring to him in that connection. Probably I had been looking up some of his additions to the Canadian Flora, published under the general title "Contributions to Canadian Botany" and somehow got it into my head at the moment I wrote those paragraphs that he, also, was the author of the additions in Part 5 of Volume 2.

In the list of Ontario specimens of Salix amygdaloides, I omitted your name as the collector of Nos. 111849-111851. Accordingly, I have inserted it where you have deleted the reference to "G.S.C."

I did not give the number 3 to the Section Albae, because they all are introduced and cultivated species. For the same reason, I did not number the species of this section and gave them only a very limited treatment. I am not very particular, however, which way the matter is handled and if you think the section should be numbered, it is satisfactory to me. I presume that some of the species have become escaped in Canada, as they have in United States. Even if the section is numbered, however, I doubt if the species should be numbered in sequence. the

I note in the key to Albae you insert "S. alba" before "var. argentea" on galley 6. I believe it is not customary in the keys to repeat the specific name where the variety carries the same number as the species with a distinguishing subletter. However, I have no particular preference either way. If the species is inserted in that case, however, it will have to be inserted also in the key to Pentandrae.

I note that you have united the last two divisions of the key to Albae. This is not desirable. As I have written the key, the first and sixth divisions are exactly comparable, including the same characters. Nothing provokes me more than to attempt to use a key in which different characters are given in the two divisions, supposedly comparable. It is merely an accident that there is only one species under the second main division. This one species should have its own distinguishing subdivision, as I have given it.

I wrote Prof. Miller about the setting of the keys, suggesting that they be run clear across both columns of the page, instead of contracted into a single column. Unless this is done, it will be very difficult to use them.

I'll appreciate your assistance in this.

The specimen No. 24241, collected by J. M. Macoun at Maple Creek, Saskatchewan, is received. As you suggest, it is lutea. I think that in my copy of the proof, which I returned to Prof. Miller, I added a suggestion that it probably was amygdaloides. I wish you would delete that statement, which is under the discussion of amygdaloides. It might be well to insert the statement that the specimen really is lutea. If this insertion is made, it should be under nigra, at or near the point where I mention the specimen.

I am about to begin work on the Section Gordatae, and think that it will be well for me to get the Canadian specimens of the species in this group and give them a careful examination before writing up any more of the text. If you can send them at your convenience, I shall be very glad to give them the best possible study. They are, as follows: balsamifera (pyrifolia), cordata, lutea, mackenziana, missouriensis, wolfii, and the closely related aggregate which has borne the various names, myrtillifolia, nova-angliae, pseudocordata, pseudomyrsinites, monochroma, etc.

Very sincerely yours,

Carleton M. Ball,
Senior Agronomist in Charge.

CRB/AJM



VICTORIA MEMORIAL MUSEUM

Ottawa, Ont., Nov. 6th, 1926.

Dr. Carleton R. Ball,
Cerealist, U.S. Dept. of Agriculture,
3814 Jocelyn St., N.W.
Washington, D.C.

Dear Dr. Ball:-

I am enclosing herewith galley proof of your paper on "Salix of the Section Longifoliae" which will appear in the November issue of the Canadian Field Naturalist. The printer is anxious to have the galley back as soon as possible. I have just gone over it once and would ask you kindly to look over it and return same at your earliest convenience. I will look after the proper setting-up of the key.

Yours very truly,

M. O. Meade

Chief Botanist National Herbarium.

November 9, 1926

Dr. M. O. Malte,
Chief Botanist, National Herbarium
Victoria Memorial Museum,
Ottawa, Ontario, Canada.

Dear Doctor Malte:

Your letter of November 4 received and noted with much interest. I appreciate your further discussion of Volume versus Number in connection with Macoun's catalog, and I am glad that you have been willing to correct the galley proof in accordance with my last letter.

The two additional specimens, Numbers 24239 and 24240, from Maple Creek, Saskatchewan, are received. The former, as you suggest, is typical amygdaloides. The latter is another specimen of lutea. To complete my citation of amygdaloides you will need merely to insert the number and insert a capital C along with the F. I will be very glad to have this done.

I agree with you that it will be desirable to indicate at the proper point in the discussion of S. nigra the identification of the three sheets from Maple Creek referred to nigra by Macoun. If you will do this, I will greatly appreciate your assistance. I thank you for looking after the set-up of the keys.

Your letter of November 6 and galley proof of the article on Section Longifoliae are received. I will read the proof as promptly as possible and return it to you.

Very sincerely yours,

C. R. Ball
Senior Agronomist in Charge

CRB:MRJ

November 10, 1926.

Dr. M. O. Malte,
Victoria Memorial Museum,
Ottawa, Ontario, Canada.

Dear Doctor Malte:

I am returning herewith three galleys of the proof of my paper on Section Longifoliae. I have made a few additional corrections and would note as follows concerning two which you have made. On galley 2A, under the Alberta distribution of melanopsis, you have deleted the s from the word Mountains in the name, Rocky Mountains Park. This name is spelled with the final s on Sanson's letterheads and on maps which he sent me. You can easily verify this on Canadian maps which are available to you.

Under Salix exigua, on galley 2A, the word Preprinted in the third line is correct. This paper was printed a year or so in advance of the appearance of the bound volumes of the Flora of California and the word Preprinted is used to indicate this condition.

A small portion of this proof either was not sent to me or was lost in some way after its arrival here. There should be a galley 4A, containing the discussion of Salix interior radiculata, which appeared on page 41 of the manuscript. I will have to ask you to get another proof of that short galley and read it for me.

Thanking you heartily for all the trouble you have taken in connection with this, I am

Very sincerely yours,

Carleton R. Ball,
Senior Agronomist in Charge.

CRB/AJM

ENC.



DEPARTMENT OF MINES



VICTORIA MEMORIAL MUSEUM

Ottawa, Ont., Nov. 16th, 1926.

Dr. Carleton R. Ball,
Senior Agronomist in Charge,
U.S. Dept. of Agriculture,
Washington, D.C.

Dear Dr. Ball:-

I am taking the page proof of your first willow paper to the printer today, instructing him to print it. I had some trouble trying to make the printers understand how to indent the keys properly as they had not previously had any experience ^{with} in botanical or other keys before, but the keys are O.K. now.

Concerning the galley proof of your second willow paper, I have secured the missing galley containing the discussion on Salix interior pedicellata, and have corrected it as requested in your last letter. In a day or so I am sending you our willow material of the section cordatae.

Yours very truly,

M. O. Waltz

Chief Botanist National Herbarium.

February 4, 1927.

Dr. M. O. Malte,
Ontario National Memorial Museum,
Ottawa, Ontario, Canada.

Dear Dr. Malte:

Work is progressing very well on the next Canadian willow papers. I shall be able to send back most of the herbarium material you sent me within the next few days. You sent me not only the species of the section Cordatae, but also several species (barclayi, commutata, glaucophylla, and glaucophylloides) from the section Commutatae. From your material, I have separated a good bunch of specimens of the fifth specimen of the Commutatae, namely, Salix pseudomonticola Ball. You sent me also one species, pedicellaris, from the section Roseae, and one, hookeriana, from the section Lanatae.

I am working up the Cordatae and Commutatae as two papers, to be published in succeeding issues and bound together in a single reprint. In working on Cordatae, I have run into one puzzling problem, namely, the identity of Andersson's S. proluxa. This species is supposed to belong to the section Roseae, with pedicellaris and other species. My problem is to determine whether it really belongs there or with the Cordatae, and whether indeed it may not be the same as S. mackenziana.

In order to determine this point, and also to finish the paper on the Commutatae, I shall need some more material, which you might be getting ready for shipment. I would prefer not to have it shipped until after you receive at least my first shipment of the material I now have.

In order to settle the position of proluxa, I shall have to study all of the section Roseae. You sent me pedicellaris (myrtilloides). I should like to receive material of the other three species of this section, namely, fuscescens, hebecarpa, and proluxa. S. hebecarpa was first described by Fernald as a variety of fuscescens, and later made a species by him. I have found some specimens of it in your material of pedicellaris.

Of section Commutatae, I now have, as noted above, barclayi, commutata, glaucophylla, glaucophylloides, and pseudomonticola. I shall need material of adenophylla (syrticola), californica (eastwoodiae), cryptodonta, latiuscula, laurentiana, and orestera (glauca villosa). The names in parentheses are other names under which the species may be found.

In preparing this material and listing it for shipment, I wonder if it will be necessary for you to go to as much labor in preparing the list as you did the last time? It seems too bad to have to write the full data from the labels for so many specimens. Would not the herbarium number, the collector, the province, and perhaps the year be sufficient to enable recognition of the sheet? I am checking the specimens against your list before packing them for return. I will write you when and what I ship.

You will be interested to know that I recently have seen two immature specimens which I can determine only as S. glauca glabrescens, collected respectively at Olds and Craigmyle, Alberta. I have not looked up the matter carefully, but it strikes me that these are farther east than any collections I have seen previously.

Very sincerely yours,

Carleton H. Ball,
Senior Agronomist in Charge.

CRB-BWG

adenophylla (*syrticola*)
californica (*eastwoodiae*)
~~*cryptodonta*~~
crustea (*glauca villosa*)
~~*laurentiana*~~
~~*latinscula*~~
barclayi, *commutata*, *glauca*
phylla, *glauca phyllodes*,
pseudomonticola

Roseae

after letter
Feb 4, 1927

fuscescens
hebecarpa

pedicellaris

hyfoglauca

prolixa

Reticulatae

nivalis

saximontana

reticulata

vestita

Herbaceae

dodgeana

herbacea

phlebophylla

September 2, 1926.

The Canadian Field Naturalist,
Prof. G. A. Miller, Editor,
Normal School,
Ottawa, Ont., Canada.

Dear Professor Miller:

I am enclosing herewith a paper entitled "Canadian Willows of Sections Pentandrae, Nigrae and Longifoliae," which I trust it will be possible to publish in your Journal. There has been no comprehensive treatment of Canadian species of Salix for many years. Numerous collectors in the field have been much puzzled by them and have expressed a desire that they be written up so that botanists can be enabled to determine them with more certainty. I am glad to undertake this and hope that the presentation will be found useful to Canadian botanists as well as to those in the northern part of the United States.

I appreciate that your Journal does not carry articles of any considerable length. The present paper will make about 15 or 16 pages of printed matter I think. It could be divided into two papers if this was found necessary. If so, the logical place to divide it would be pages 1 to 29 and pages 30a to 41. Sections Pentandrae, Nigrae and Albae, the latter occurring on page 29, are rather closely related and similar in appearance and preferably would be kept together. The Longifoliae, which begin on page 30a, are a distinct section of the genus and could be published by themselves. If it is divided as two separate papers, it will not be necessary to return it to me, as I simply would rewrite a part of page 2a and write a new introduction for the second paper.

Another way to divide the paper would be to publish so many pages in each of two or three issues. If that were done, I would like to have the reprints of the two or more issues assembled for distribution as a single paper.

Dr. Malte, of the Victoria Memorial Museum, is much interested in the collection and identification of Canadian willows and will be very glad to recommend the publication of the paper, if recommendation by a member of the club is required. I have sent him a carbon copy of the paper.

If the series of papers can be published in the Field Naturalist, I would expect to send one or two more during the winter and coming spring. There probably will be about six of the present size.

Thanking you in advance for your consideration of this matter,
I am

Very sincerely yours,

Carleton R. Ball,
Senior Agronomist in Charge.

CRB/AJM

ENC.

PRESIDENT
G. A. MILLER
180 BELMONT AVE.
OTTAWA, ONT.

SECRETARY
J. F. WRIGHT
148 THIRD AVE.
OTTAWA, ONT.

The Canadian Field-Naturalist

A CONTINUATION OF THE OTTAWA NATURALIST
ESTABLISHED 1887

A MAGAZINE DEVOTED TO THE STUDY AND THE PUBLICATION OF ORIGINAL RESEARCH IN
CANADIAN NATURAL HISTORY AND PUBLISHED BY

The Ottawa Field-Naturalists' Club

WITH THE ASSISTANCE OF AFFILIATED SOCIETIES

HON. TREASURER
B. A. FAUVEL
321 McLEOD ST.
OTTAWA, ONT.

G.A. Miller

EDITOR

OTTAWA, CANADA, September 14th., 1926.

Mr. Carleton R. Ball,
U.S. Department of Agriculture,
Washington, D.C.

Dear Mr. Ball:

Your letter of 2nd inst. and Manuscript on Canadian Willows reached me a few days ago. Dr Malte had already mentioned to me that such would be forthcoming.

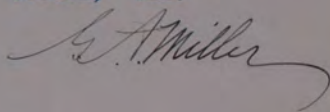
I am much pleased to have your article and others that may follow. I recall that some few years ago a Canadian Botanist made mention to me of the need of a classification of this group of trees.

I have seen the printer of the Naturalist. He thinks that the pages 1 to 29 will take 8 or 9 pages in our publication.

We will get that out in one issue and follow it with the remaining part the following number. If you can give me the change you wish to make in 2a I will get a proof of it and have it returned for correction. It is possible that I might be able to get a proof of the remaining portion of the paper at the same time, so that I should appreciate having the introduction to the Longifoliae at the same time.

Hoping to hear from you in due time,
I am

Yours very truly,
G.A. Miller,
Normal School,
Ottawa, Can.



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Huntingdon, B.C.

TORONTO FIELD-NATURALISTS' CLUB,
Toronto, Ont.



September 16, 1926.

The Canadian Field Naturalist,
Normal School,
Ottawa, Canada.

ATTENTION OF PROF. G. A. MILLER

Dear Prof. Miller;

Your letter of September 14 is just received, and I am very glad indeed to know that the manuscript can be handled in your publication on the basis of division into two parts. As I am leaving town I hasten to make the necessary changes on page 2. I enclose herewith a rewritten draft of the first paragraph of page 2, which please substitute for that paragraph in the original draft. The second paragraph, which is a description of *Pentandrae*, can stand unchanged.

If I have time I will write the facing sheet for the section *Longifoliae* and include it in this letter. If time lacks I will send it when I return in three or four days. *(enclosed)*

Very truly yours,

Carleton R. Ball,
Senior Agronomist in Charge.

CRB/AJM

ENC.

P. S.

On page 1 the word "*Longifoliae*" in the title of the paper should be changed to "*Albae*." The title of the first paper then will read "*Canadian Willows of Sections Pentandrae, Nigrae and Albae*."

The sections Pentandrae and Nigrae comprise the Fleonandrae group, characterized by 3 to 5 or more stamens. The species in section Albae resemble those of the sections Lucidae and Nigrae but have only 2 stamens, like all the remaining sections except one, which has only 1 stamen. All three of these sections, however, have one character in common, namely, yellow or straw-colored deciduous scales subtending the flowers of both sexes. As a whole, these sections of the genus are adapted to regions having a warm temperate, temperate, or cool temperate climate. They are widely distributed in the Sonoran (especially Upper Sonoran), the Transition, and the Canadian zones. Of the 6 native species, at least three, S. caudata, S. lasiandra, and S. serissima of the Pentandrae, penetrate beyond latitude 55° N. This is approximately the latitude of the central portions of Manitoba, Saskatchewan, Alberta and British Columbia and the southern extremity of Alaska.

PRESIDENT
G. A. MILLER
180 BELMONT AVE.
OTTAWA, ONT.

SECRETARY
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148 THIRD AVE.
OTTAWA, ONT.

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EDITOR

HON. TREASURER
B. A. FAUVEL
321 McLEOD ST.
OTTAWA, ONT.

OTTAWA, CANADA, October 25, 1926

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Victoria, B.C.

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Quebec, P.Q.

BRITISH COLUMBIA ORNITHOLOGISTS'
UNION
Huntingdon, B.C.

TORONTO FIELD-NATURALISTS' CLUB,
Toronto, Ont.

Carlton R. Ball
U.S. Dept. of Agriculture,
Washington, D.C.

Dear Sir

I am forwarding to you
under separate cover the galley
proof of the first 29 pages of
your article of "Canadian Willows,
etc." for correction. I will get it
out as soon as returned to me.
I note that you will require
reprints of the same. You will
have forwarded to you 25 copies
of the issues in which your
contributions appear.

Yours very truly
G. A. Miller
Normal School,
Ottawa, Can

PRESIDENT
G. A. MILLER
180 BELMONT AVE.
OTTAWA, ONT.

SECRETARY
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148 THIRD AVE.
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HON. TREASURER
B. A. FAUVEL
321 McLEOD ST.
OTTAWA, ONT.

G. A. Miller

EDITOR

OTTAWA, CANADA, October 25, 1926.

Carleton R. Ball,
Bureau of Plant Industry,
Washington, D.C.

Dear Sir:

After posting the proof of your article on Canadian Willows to-day I showed Dr. Malte the other proof which was supplied by the printer. He suggested that the specific names which are numbered and which constitute headings such as *Salix serissima* etc. at the head of page 9 in the manuscript should appear in heavy (black) Roman type.

If this meets your approval, I shall have the printer make the change.

Yours very truly

G. A. Miller.
Normal School,
Ottawa, Can.

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Quebec, P.Q.

BRITISH COLUMBIA ORNITHOLOGISTS'
UNION
Huntingdon, B.C.

TORONTO FIELD-NATURALISTS' CLUB,
Toronto, Ont.



October 29, 1926.

The Canadian Field Naturalist,
Normal School,
Ottawa, Ont., Canada.

ATTENTION OF PROF. G. A. MILLER

Dear Prof. Miller:

Your two letters of October 25 and accompanying proof of the paper entitled "Canadian Willows of Sections Pentandrae, Nigrae and Albae" were duly received. I have read the proof and am returning it herewith.

I heartily agree with Dr. Malte's suggestion that the names of the species, where used as center headings, should be in heavy black type. This will make them stand out much more conspicuously. If it is not possible or desirable to set them in the bold face type, they could be set in capital letters of the next size smaller than those used for the section headings.

I have indicated, also, that it is desirable to leave more space between these center headings and the paragraph of text immediately preceding. Perhaps this will be done automatically when the galley proof is broken up for the page proof, but I was not sure of your practice in this connection.

If the Latin names used as center headings are set in bold face type, or in capital letters not italics, the name of the author of the species can be set in the same type, if desired. I note that in the present galleys the names of the authors are sometimes set in italics like the Latin names, and sometimes in Roman type. Where they were set in italics I have indicated that they should be in Roman.

In four places, namely, on galley 3 and on galley 5 and galley 6, I have made slight additions to the text, chiefly because of additional knowledge. None of these insertions should cause any change in the type already set, as two of them come at the ends of paragraphs. One is substituted for a statement which I have deleted, and one is a footnote. I trust, therefore, that it will be possible to make these small changes.

The thing about which I am most concerned is the printing of the keys to the species and varieties now appearing on galleys 1, 5 and 6. Where these keys are rather long, as in the case in the key to Pentandrae, on galley 1, it will make it very difficult to use them if they are set as they now appear in the narrow column without indentation to show the rank of the different portions of the key. Will it not be possible to run these keys across both columns of the text page, at least, in the case of the longer keys? This will permit the indentation as it appears in the manuscript submitted. The key to Nigrae, on galley 5, has only two lines and, therefore, is not seriously disturbed by this arrangement. The key to the section Albae, on page 6, however, is considerably longer and requires the proper indentation. I very much hope you will be able to set these two keys and also that for the section Longifoliae, in the second paper, in the manner indicated, namely, the full width of the page.

I note from your letter that 25 copies of the issue, containing my paper, will be sent me. In addition, I would like to have 100 reprints without covers but, if possible, with the same pagination as they will have in your journal itself. *These at my expense*

Very sincerely yours,

Carleton B. Bell,
Senior Agronomist in Charge.

CRB/AJM

ENC.

PRESIDENT
G. A. MILLER
180 BELMONT AVE.
OTTAWA, ONT.

SECRETARY
J. F. WRIGHT
148 THIRD AVE.
OTTAWA, ONT.

The Canadian Field-Naturalist

A CONTINUATION OF THE OTTAWA NATURALIST
ESTABLISHED 1887

A MAGAZINE DEVOTED TO THE STUDY AND THE PUBLICATION OF ORIGINAL RESEARCH IN
CANADIAN NATURAL HISTORY AND PUBLISHED BY

The Ottawa Field-Naturalists' Club

WITH THE ASSISTANCE OF AFFILIATED SOCIETIES

HON. TREASURER
B. A. FAUVEL
321 McLEOD ST.
OTTAWA, ONT.

G.A. Miller

EDITOR

OTTAWA, CANADA, December 28, 1926.

Carleton R. Ball,
Chief Agronomist,
Bureau of Plant Industry,
Washington, D.C.

AFFILIATED SOCIETIES

ALBERTA NATURAL HISTORY SOCIETY
Red Deer, Alta.

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HISTORY OF CANADA
Quebec, P.Q.

BRITISH COLUMBIA ORNITHOLOGISTS'
UNION
Huntingdon, B.C.

TORONTO FIELD-NATURALISTS' CLUB,
Toronto, Ont.

Dear Sir:

You will have received the issue of the *Naturalist* containing the second instalment of your article on Canadian Willows. I will direct the Secretary to forward you 25 copies of the issue.

I think you stated the number of separates containing all that appeared in the October and November issues, but I left the letter with Dr. Malte who has not returned it.

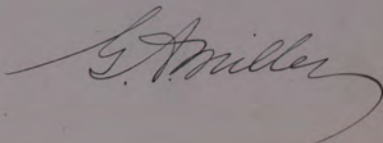
Would you let me hear whether you wish to have the separates appear with cover and if so give me a little sketch with the wording which you wish to appear on it. Would you also remind me of the number of separates required.

I am indebted to Dr. Malte for having taken time with our printer to get the matter set up in proper form. I hope you have found the appearance satisfactory in every way.

Yours very truly,

G.A. Miller

Normal School, Ottawa,
Canada.



Dec. 31, 1926.

Prof. G.A. Miller,
Normal School, Ottawa, Ont. Can.
Editor Can. Field-Nat.

Dear Prof. Miller:-

Your letter of Dec. 28 just received. As yet I have not seen a copy of issue of the Can. Field-Nat. containing either of my papers, although I have had letters from several friends referring to the first. I suppose the library of our Dept. has received its copy but I have been absent following and operation.

I will be very glad to receive the 25 free copies at your convenience, tho if you wish to hold them to ship with the reprints, that is wholly satisfactory to me.

In my letter of Oct. 29 to you, which you say Dr. Walte has,

I placed an order for 100 reprints of these two papers. My understanding is that that the two will be reprinted in one reprint, and I want 100 copies of that. I hope that the pages in the reprint can bear the same page numbers as in the Naturalist, as that helps users who wish to cite parts of the paper later.

I ordered the reprints without covers, but would be glad to have covers if the charge is not too great. If no cover is attached the reprint should show "Reprinted from Canadian Field-Naturalist (vol. no); (pages), date."

If covers are supplied the title might be - -

"Canadian Willows of Sections Pentandrae, Nigrae and Albae.

"Canadian Willows of Section Longifoliae.

By. CARLETON R. BALL

U.S. Department of Agriculture

Reprinted from

THE CANADIAN FIELD-NATURALIST

(Vol. pages and dates)"

Very sincerely yours,

With appreciation
and best New Year wishes

Carlton R. Ball

*Pls. Can working on next group and have
just run on to a new remnant of paper*

PRESIDENT
G. A. MILLER
180 BELMONT AVE.
OTTAWA, ONT.

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OTTAWA, ONT.

G.A. Miller

EDITOR

OTTAWA, CANADA, January 24, 1937.

Carleton R. Ball,
Bureau of Plant Industry,
Washington, D.C.

AFFILIATED SOCIETIES Dear Sir:

ALBERTA NATURAL HISTORY SOCIETY
Red Deer, Alta.

HAMILTON BIRD PROTECTION SOCIETY
INC.
Hamilton, Ont.

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Quebec, P.Q.

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UNION
Huntingdon, B.C.

TORONTO FIELD-NATURALISTS' CLUB,
Toronto, Ont.

Referring to your letter of Dec. 31st.,
I am pleased to know that you have been able to
resume work on Canadian Willows.

I gave instructions to the publisher
to have 100 separates of your articles (in one which
have already appeared. I am going to have the
Secretary forward these along with the 25 copies
of the November issue to which you are entitled.
These should be ready soon.

I had the Secretary instructed to
send you 25 copies of the October issue. If not re-
ceived, I will look up the matter. I think, I gave
your official address for mailing them.

With best wishes, I am

Yours very truly,

G.A. Miller,

Normal School,

Ottawa, Can.



January 27, 1927.

Prof. G. A. Miller,
Normal School,
Ottawa, Canada.

Dear Professor Miller:

Your letter of January 24 is just received, and I am glad to say that I have been able to make good progress on the manuscript of the next two sections of Canadian Willows, namely, Cordatae and Comutatae. It probably will be desirable to publish these in consecutive numbers of the Field Naturalist, and let the reprints be issued together.

I thank you heartily for looking after the reprints of the two articles published in the October and November issues, respectively. I have received the 25 free copies of the October issue, and will be glad to receive the same number of the November issue at the time the reprints are mailed out.

With kind personal regards, I am,

Very sincerely yours,

Carleton R. Ball,
Senior Agronomist in Charge.

CRB-BWG