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The Hunt Institute for Botanical Documentation, a research division of Carnegie Mellon University, specializes in the history of botany and all aspects of plant science and serves the international scientific community through research and documentation. To this end, the Institute acquires and maintains authoritative collections of books, plant images, manuscripts, portraits and data files, and provides publications and other modes of information service. The Institute meets the reference needs of botanists, biologists, historians, conservationists, librarians, bibliographers and the public at large, especially those concerned with any aspect of the North American flora.

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 GOVERNMENT OF
THE PROVINCE OF BRITISH COLUMBIA

OFFICE OF PROVINCIAL MUSEUM
VICTORIA

October 16th, 1926.

Dr. C. R. Ball,
United States National Museum,
Washington, D. C.

Dear Sir:

As on former occasions, I am taking
the liberty of sending you one or two specimens
of *Salix* for your determination or verification.
Full data is attached to each specimen. If there
are any duplicates you would like to retain from
a locality point of view, I shall be only too
pleased for you to accept them.

Hoping I am not troubling you too much.

Thanking you in advance.

Yours very truly,

G. A. Hardy

GAH/NB.

Assistant Biologist.



from G.A. Hardy



THE GOVERNMENT OF
THE PROVINCE OF BRITISH COLUMBIA

OFFICE OF PROVINCIAL MUSEUM
VICTORIA

December 7th, 1926.

Dr. C. R. Ball,
Senior Agronomist in Charge,
Office of Cereal Investigations,
Bureau of Plant Industry,
U. S. Department of Agriculture,
Washington, D. C.

Dear Sir:

I thank you for your letter of the 26th ult., and also for the return of the specimens of *Salix* submitted to you for identification, and which arrived today.

In reference to your letter, Mount Garibaldi is as you surmise on the east side of Howe Sound. I believe this mountain is listed in a publication entitled the "Dictionary of Altitudes in Canada", Commission of Conservation, Dept. of Interior, Canada, 1916.

Many thanks for drawing attention to the specimen other than *Salix* mounted in error on sheet No. 8186. This appears to me to be *Gaultheria myrsinites*, which has a creeping habit of growth similar to the Willow, among which it sometimes intrudes.

I hope on receipt of this that the specimen of *S. mackenziana* will have reached you. However, we are already looking into the matter, in order to trace it in case it has gone astray.

I have just received the "Canadian Field Naturalist" with the first article on Canadian Willows by you, and I am sure this will be a very great help to us in our museum work. I am looking forward to the future instalments.

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*These were
sent back on
Dec 4, 1926*

Thanking you exceedingly for your
kindness and help in determining the Willows.

Yours very sincerely,

G. A. Hardy

GAH/NB.

Assistant Biologist.



OFFICE OF PROVINCIAL MUSEUM
VICTORIA

October 12, 1943.

Dr. C. R. Ball,
Executive Secretary, Coordinating Committee,
Extension Service, U.S. Department of Agriculture,
Washington, D. C.

Dear Dr. Ball:

I am taking advantage of your standing offer to examine *Salix* for the Provincial Museum at any time, by forwarding a parcel of specimens for your identification. I have included all the material on hand concerning the sheets submitted, hence so long as we can have representatives returned you are welcome to any duplicates you may wish to retain.

Unless otherwise indicated they are from the neighbourhood Latitude 51° 5' and Longitude 116° -- the Kootenay Park area of British Columbia and the area west of Banff, Alberta.

I am looking forward to seeing your completed monograph of the *Salix*, one which I am sure will clear up a lot of puzzles in this intricate group of plants.

With best wishes,

Yours sincerely,

George A. Hardy

George A. Hardy,
Botanist.

GAH/MC

November 11, 1943

Professor George A. Hardy,
Botanist, Provincial Museum,
Victoria, B.C., Canada.

Dear Professor Hardy:

Your letter and package of willows, sent on Oct. 12, were promptly received but determinations have been delayed, for which I am sorry. I inclose two copies of the list of determinations.

I am in doubt about the geographical origin of some of the specimens. I arranged the list in two parts: Certainly or Probably Alberta, and Certainly or Probably British Columbia. I will be glad if you will check the correct Province on the carbon-copy list inclosed and return it to me.

In some cases, the name of the Province was written on the original newspaper sheet containing the specimen, along with the other data. In such cases, I have underscored the Province in the lists, Alta., etc. In other cases, it appeared only on the little slips inserted with the specimens. In such cases, I have written it without scoring, as Alta., etc.

In several cases, the name of the province did not appear at all. I first arranged the specimens in order of dates of collection, as the numbers on the sheets obviously were not in order of collection. I assumed that Carrot Creek, Minnewakee Cabin, and Mosquito Creek, June 5-8, were west of Banff, (June 2), but Camrose, June 16, is southeast of Banff.

Healy Creek (Nos. 1-5) was said on the insert slip to be in "Kootenay Park, B.C.", but on my detailed map it is in western Alta, and flows to the Bow River. Two of the specimens are labelled June 18 and the other July 18. Shadow Lake, June 21, is shown on map near the BC-Alta line but in Alta. Clearwater River and Clearwater Lake, the latter listed as Alta. on the sheets, I cannot find and would like to know the locations. *S. arbusculeoides*, collected on Clearwater River, is an extreme southern locality for this species and exactness is important. The Cairn and Byng Passes, and Mt. Southesk I cannot locate on my maps.

Vermilion Crossing is not located on the labels but I find Vermilion River in B.C., and Tokumm Creek beyond it, but there is a Vermilion Creek in Alberta, just to the east. I have listed bot sets as in B.C.

S. "glauceps" is a catchall for several forms. Certain identification must wait on the placement of *S. desertorum*, the earliest-named in the complex, and with a very immature type specimen. One Clearwater R. specimen is very similar to it and I have so named it. The unnamed var. of *S. Drummondiana* differs from the species in much narrower leaves and will get later treatment.

Many thanks for your permission to keep portions where material was sufficient. I kept parts of *S. arbusculeoides* and *S. desertorum* and small fragments from a few others. The package is being sent to you by mail.

Appreciating your helpfulness, I am

Cordially yours,

Carleton R. Ball, Collaborator



OFFICE OF PROVINCIAL MUSEUM
VICTORIA

January 4, 1944.

Dr. Carleton R. Ball,
Extension Service,
United States Department of Agriculture,
Washington, D. C.

Dear Dr. Ball:

Many thanks for your letter of December 20
and promise of available separates which arrived to-day;
they are a valuable addition to our library.

Yours sincerely,

George A. Hardy

George A. Hardy,
Botanist.

GAH/MC

Dr. George A. Hardy,
Provincial Museum,
Victoria, B.C. Canada.

November 11, 1944

Dear Dr. Hardy:

Your letter of Oct. 19 promptly received and your desire for some comments on the Paradise Valley willows is noted.

Being pressed right now, I have just sat down at the typewriter and run off the inclosed discussion of your collections and those of W.B. Andersen in that valley.

You certainly will not wish to run this as an item under my name but it may give you the information desired. You will reduce, expand, and/or rearrange the material to suit yourself when the time comes. If you then wish to credit me as a source of some of the information, that is all right. If there are points which you desire and I have not covered, please let me know.

Anderson's material, collected in 1923, 1925, and 1927, should be in the Provincial Museum. The earlier ones were sent by W.R. Carter or F. Kermode to the late C.V. Piper and determined by me. Those of 1927 were sent to me, apparently. All were returned to the Museum.

The specimen of *S. vestita* var. *erecta* was Anderson No. 8300 and, according to my list, was determined as var. "*stricta*" which was an error. I inclose correction label.

His collection of *S. Eastwoodiae* was No. 6467 (or his No. 2015). While I was in the Univ. of Calif. from 1930-35 I got much better acquainted with this species and have abundant material now. Some time when you are sending a packet, please put this specimen in and let me review it before I monograph and give distribution.

Anderson's No. 8279, *S. Barrattiana*, contained an admixture of *S. commutata* var. *denudata*. His No. 8300, *S. vestita* var. "*stricta*" was mixed with *S. anglorum* var. *arriocladia*. I separated the two species before returning them and I suppose they were mounted separately.

His No. 6466 of 1923, determined as *S. Barrattiana*, I noted as having leaves "narrowly oblanceolate to oblanceolate", which makes it var. *angustifolia* Anders. I inclose correction label.

His No. 8279 of 1927, *S. Barrattiana*, I made no notes on. If the leaves are broad with bases rounded to subcordate it is the species. If they are narrow, oblanceolate with narrow bases, it is the variety *angustifolia* Andersson.

The spec. of *S. Eastwoodiae* may be under its earlier name, *S. californica* Bebb.

Cordially yours,

Carleton R. Ball, Collaborator



OFFICE OF PROVINCIAL MUSEUM
VICTORIA

November 22, 1944.

Dr. C. R. Ball,
Extension Service,
United States Department of Agriculture,
Washington, D. C.

Dear Dr. Ball:

Thank you very much for your letter of November 11 and corrections which now brings our *Salix* pretty well up to date.

It is most kind of you to provide the remarks on the Paradise Mine Willows. These will greatly increase the interest of our report on that district and indicate the desirability of further explorations there. The local occurrence of many species of the plants in general, often only a small colony on one extensive ridge, would explain the difficulty of duplicating the collections of previous visitors and by the same token the possibility of missing other species altogether.

I will remember to include our specimen of *S. Eastwoodii* in my next batch.

Yours sincerely,

George A. Hardy

George A. Hardy,
Botanist.

GAH/MC



OFFICE OF PROVINCIAL MUSEUM
VICTORIA

November 24, 1944.

Dr. Carleton R. Ball,
Extension Service,
United States Department of Agriculture,
Washington, D. C.

Dear Dr. Ball:

By some oversight I did not see your letter of September 30 until recently and I realize that I not only omitted to inform you on certain localities about which you were in need, but I unwittingly inflicted extra work upon you in looking up records which I would otherwise not have asked for at the time. Please accept my apologies.

Osoyoos is close to the southern boundary of British Columbia, Latitude 49 degrees, Longitude 119 degrees 30 minutes. It is a portion of the Sonoran Zone, that extends a short distance into this province from the south, with its typical flora and fauna.

The other localities are as you suggest, all in eastern British Columbia with the exception of Kamloops which is more central.

I am delighted to hear that you are working up the Willows of Alaska - Yukon and adjacent territory as this will be of great value to us.

With best wishes and the compliments of the season,

Yours sincerely,

George A. Hardy

George A. Hardy,
Botanist.

GAH/MC

(See over)

Professor George A. Hardy,
Provincial Museum, Botany,
Victoria, B.C., Canada.
Dear Professor Hardy:

December 8, 1944

Thanks for the location of *Osoyoos*, as given in your letter of Nov. 24.
I will add the data to the list of determinations.

I do not have your previous letter here as I write, but I am conscious of no request from you that was in any way burdensome. You have been very helpful to me in the matter of material illustrating the ranges and variations of B.C. willows and I have learned much. The opportunity to get notes into the public eye is always appreciated, and the notes on Paradise-Valley willows were a pleasure.

Cordially yours,

Carleton R. Ball

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February 15, 1946

Prof. George A. Hardy, Botanist,
Provincial Museum, Victoria,
British Columbia, Canada.

Dear Professor Hardy:

Your letter of January 19 came promptly and the packet (carton) of willows reached me on Feb. 12. It had been through our quarantine inspection here at the Dept. and came to me from there. Ordinarily inspection is at the border port, usually St. Paul, Minn., and I do not know reason for change.

The specimens were in the original carton used by you, which was long enough for the actual specimens but about an inch shorter than the folders. Apparently, in slipping them into the carton, it was necessary to bend up the tips of the folders to get them into the box. The plants evidently were at the top of the folders and therefore their tips were bent up and many of them broken off. That was just too bad. I have no way of knowing whether it was done in packing out there or occurred when replaced in the carton here after inspection. In any case it ~~was~~ resulted from the folders being longer than the carton. I'm sorry it happened.

I have returned the specimens by mail, discarding the carton, badly crushed, and using stiff cardboard. I trimmed the folders down to the length of the cardboard and folder we use. The inner packet is tied tightly and the outer wrapping likewise. Please let me know how they arrive.

Taking advantage of your kind permission to retain duplicates, I have kept 1 specimen of each where there was more than one folder of the same number, as in 18271, 18272, 18275, 18282, 18949, 18951, and 18958 A & B. Many thanks.

I inclose a copy of my list of determinations, altho you will not need it as you have the specimens. The list will show however, that I do not know the locality for the collections on the second page. Were they also from Manning Park? The numbers are later but the dates earlier than those for the Manning Park specimens on page 1. The year also is not given.

Is my footnote on p. 2 correct in assuming that the data on the folder in that series belonged with data on the label?

You will note that there was one *Populus* and one *Vaccinium* in the lot. The *Vaccinium*, by the way, appears to have come from the Arctic, but I cannot locate "Bighorn". and the number does not belong to these series.

I was wrong about that supposed *S. Eastwoodiae*. I have learned a lot in the 22 years since then, especially about the varying expressions of *S. pseudocordata* at different elevations and in different habitats.

I note that the specimens of *S. Scouleriana* all are more glabrate than is normal for the species, which may be one effect of that habitat.

You will note that ~~THE~~ 18285 was a mixture, now designated as A & B, and that I separated the two sexes in 18958 in the same way.

Cordially yours,

Carleton R. Ball
Collaborator

BC

3814 Jocalyn St., N.W.
Washington 15, D.C.

Dr. G.A. Hardy,
Botanist, Provincial Museum,
Victoria, B.C., Canada.

September 11, 1947

Dear Dr. Hardy:

On my recent return to Washington I find your letter of Aug. 22 and the Package of *Salix* specimens. I am very glad to examine these and will return them by mail tomorrow, with annotation label in each number.

The five specimens received as *S. mackenziana* (or *prolixa*), from Lost Lake, Vancouver Id. are all var. *macrocarpa* Ball, separated from the species chiefly by pubescent twigs. You note that No. 19780 of 1946 and Nos. 19316 (2 sheets) and 19489 of 1947 all are from the same bush on different dates. As the two specimens of 19316 are of different sexes, I doubt if they could have come from the same plant.

The three specimens sent as *S. melaina* Henry all are *S. Ceyeriana* Andersson, var. *melaina* Henry. This var., confined to areas west of the Cascades, is distinguished by dark -brown of blackish twigs, never pruinose.

The specimens from the Skagit Valley in SW. B.C. (about Long. 121 W), you have also named correctly.

Salix lasiandra (Nos. 20518 and 20518A) are var. *lanceifolia* (Andersson) Bebb, by pubescent twigs. The first has some interesting sprout twigs and the fruits of the second have rather long styles.

Salix sitchensis Sason (No. 20520) is normal foliage.

Salix Seculeriana Barratt (Nos. 20519, 20521, 20521A, and 20521B and 20522) represent the upland form of the mountains with obovate leaves, rather than the coastal form with more elliptical-oblongate leaves. It may require separation as a variety perhaps *Nuttallii*, later.

S. Seculeriana (Nos. 20519A and 20523) is the var. *Thompsoni* Ball, with slender twigs and reduced leaves and catkins. These leaves apparently are young and would increase in size considerably before growth stopped.

If you have any questions on these I'll be glad to answer them, if possible. I'm very glad that you are purposing publications on the local floras. Much of our best work is done by local men (rather than specialists) and on local floras. We need more of them.

Whenever, you have *Salix* for naming, send them along.

Cordially yours,

Carleton R. Ball

P.S. I see that I have neglected your query regarding *S. prolixa*. Anderson thought it belonged in the *Rosa* group, with *S. pedicellaris* var. *hypoglauca*, etc. Apparently it is just *S. mackenziana*, although some specimens have leaves so finely reticulated as to resemble those of *S. pedicellaris* & vars.

Prof. George A. Hardy,
Botanist, Provincial Museum,
Victoria, British Columbia, Canada.

October 11, 1947

Dear Professor Hardy:

Your letters of Sept. 24 and 26, and the packet of V.I. willows, all were promptly received, that is, as promptly as any willows get thro the Customs inspection. I have determined the specimens and inclose copy of a list and some notes on the specimens, both list and notes primarily for my own information.

Unfortunately, I neglected to read your second letter again when the packet came and I studied the willows. Now, when I come to reply, I find that you asked certain questions which I cannot answer, as the packet has been mailed.

You speak of comparison of two specimens, Nos. 20534 and 20535, and suggest that 20534 is *S. lasiandra*. I see that in my list No. 20534 is *S. G. var.*, and 20535 is *S. lasiandra*. Please check the specimens when they arrive and see if I got the numbers mixed. There is no question of the identity of the two. The one with large serrulate leaves was *S. lasiandra* and the one with very small leaves acuminate at both ends was *S. Geyeriana var. melaina*.

Jones had no warrant for making *var. melaina* a species. He had never studied willows especially. The only difference between this variety and the species is that *melaina* seldom has pruinose branches and then only thinly or faintly so and the twigs average darker. Plant of *S. Geyeriana* from east of the Cascades has thinly pruinose twigs under certain conditions and some times has darker twigs also.

It would help a lot if more knowledge of the size and habitat of depauperate specimens could be had. For example, *S. sitchensis*, No. 20533, is extremely depauperate yet fully mature. Was it a low shrub, perhaps in rocks or perhaps injured by flood or snowdrifts? Mrs. Carl's *S. Baralayi* was quite off type and there probably were physical reasons. So also with that specimen of *S. Geyeriana var. melaina* (No. 20534). Something in the local habit probably caused it and affected its height also.

I am especially sorry that I neglected to read again your 2nd letter before determining the willows, because one of the *S. Geyeriana* is said to have been bisexual. This is not uncommon but I would have liked to have studied the expression on that specimen.

Hermaphrodite flowers are not uncommon in *Salix*. Occasionally perfect flowers with pistil and stamens in the same flower subtended by the same scale, are found. Usually, however, the pistillate and staminate are separate but in the same ament, in which case the staminate usually predominate in the lower part and the pistillate in the outer part of the ament. Some years ago I sent you a copy of my brief paper "Teratology in Willows", in which hermaphrodite flowers are discussed very briefly. There is a considerable literature and I will try to list some of the papers for you before I mail this letter.

Separately I am sending a few more reprints. Va. Willows contains material on uses of willows. The last two (More plant study: Fewer Plant names; Studying willows or making new sections in *Salix*) discuss the normal variations of the plants and are intended to inspire more study of the plants themselves, in nature as well as in the herbarium.

Cordially yours

Carleton R. Ball
Collaborator