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About the Institute

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.

Flora of Wyoming

Clippings from folders in Ball Archives - W.A.Archer, Sept. 1961

Wyo. Papers & Lists

Gazeteer

Possible Spp. + Vars.

Reeds' Colls. 1947-49, 1950,
Murie, Teton Co. 1933

Natl. Arb. List.

Lot I.

Fragiles

Lucidae

Triandrae

Longifoliae

Lot II.

Cordatae

(Lasiolepes)

Wolganiae

Lots III, IV, V.

Wyoming Willows
By Sitchens, Species, and Varieties

Lucidae

1 *S. caudata* (Nutt.) Heller
1a. var. *Bryantiana* Ball & Bonnier

S. lasiandra Benthams
var. *lanceifolia*

S. pentandra L. (Introduced)

Fragiles

S. alba L.

S. fragilis L.

Trandae

2. *S. amygdaloides* Andersson

Longifoliae

4 *S. exigua* Nutt.

4a var. *nevadensis*

3a *S. interior* Rawles var. *pedunculata* (Andr.) Ball

5. *S. melanopsis* Nutt.

5a var. *tenerrima* (Tuck.) Ball

Cordata

2

S. lutea Nutt.
var. *platyphylla* Ball
var. *Watson* (Bebb) Schum.

S. ligulifolia Ball.

S. pseudocordata (And.) Rydb.
var. *aequalis* And.

S. monosperma Ball

Committata

S. Barnebyi Anderson
var. *Lebesarpo* And.

S. committata Bebb
var. *puberula* Bebb

S. pseudo-ovata Ball
var. *padophylla* (Rydb.)

Chrysanthra

S. Tweedyi (Bebb) Ball

Roseae

3-

56

Fern

→ *S. pedicellaris* Ph., var. *hypoglauca*

Reticulatae

S. nivalis Hooker
var. *saximontana* (Rydb.) Schreb.

S. vestita Rusch
var. *erecta*

Retusae

S. Cassadensis Chitt. (Stemmer Hook.)

S. Dodgeana Rydb.

Lasiolipes Schneider

S. lasiolytis var. *Sandbergii* Ball

S. verrucata Andersson

Wolfianae Schneider

S. Wolfii Beck
var. *idahoensis* Ball

1 a. S. caudata (Nutt.) Heller, var. Bryantiana Ball & Bracelin. Few-stemmed shrub or small tree, 2-5 m. tall; twigs chestnut to reddish, glabrous, or the young sparingly puberulent (as bud scales and petioles) and soon glabrous; ~~all~~ (all rather or densely pubescent in the species); stipules semi-ovate to reniform, 2-5 mm. long; petioles stoutish, glandular above at apex; blades lanceolate, long-acuminate (tailed), 6-15 or 20 cm. long, 1.5-3 or 4 cm. wide, closely glandular-serrulate, green on both sides but paler beneath; aments coctaneous, leafy-peduncled, 2.5-5 cm. long, 1.5 cm. wide; scales elliptic-oblanccolate, 2-3 mm. long, often shallowly toothed, crinkly-pilose, pale yellow, deciduous; stamens 4-5, pubescent at base; capsules lanceolate, 5-7 mm. long, glabrous; pedicels 1.5-2.5 mm. long, glabrous; styles and divided stigmas 0.2-0.4 mm. long. (S. lasiandra and varieties have leaves glaucous beneath when expanded).

Stream banks and valleys to 9000 feet elevation, SW. B. C. and so. Alta. to So. Calif. and east to the Rocky Mts. from Mont. to N.M. More common southward and eastward. Wyo.: throughout the mountainous area, east to Bih Horn and Sheridan Counties in NE. Wyo.

1 b. S. caudata, var. parvifolia Ball. Smaller shrub; leaves 5-8 cm. long, 7-18 mm. wide. Sparingly, at higher elevations, with the species and var. Bryantiana. Wyo.: Teton Co. and Yellowstone Natl. Park, and Sublette Co. also. (?)

Salix fragilis L. Crack Willow, Brittle Willow. Introduced large tree to 20 m. high and 1 m. diameter; twigs greenish to dark red, glabrous, very brittle at base and deciduous in winds; stipules wanting, or small, semicordate, early deciduous; petioles 7-15 mm. long, glandular above at apex; leaves narrowly lanceolate to lanceolate, 7; 12 or 15 cm. long, 2-3.5 cm. wide, glandular serrations 4-6 per cm., dark green above, glaucescent to glaucous beneath, glabrous at maturity; aments coctaneous, slender, lax, 4-8 cm. long, 8-10 mm. wide, on leafy peduncles 1-~~2~~ 3 or 5 cm. long, bearing 2-5 small leaves; flower scales oblong, greenish-yellow, crisp-villous, deciduous; capsules narrowly conic, 4-5.5 mm. long, glabrous; pedicels 0.5-1 mm. long; styles 0.3-0.7 mm. long, stigmas short, notched.

Widely introduced from Europe in colonial times for gunpowder charcoal, ornament, sentiment and shade. Common in farmyards and pastures in the East, and frequently escaped; less common westward. Wyo.: City Park, Laramie. Hybrids with S. alba are common in cultivation.

A. pentandra L. Introduced tree with low, spreading crown; twigs mostly reddish-brown glabrous, shining; leaves ovate to oval, 4-9 cm. long, 2-4 cm. wide, shortly acuminate at apex, rounded to subcordate at base, closely glandular serrate, dark green above, paler to glaucescent beneath, glabrous; petioles 2-7 mm. long, glandular above at distal end; aments coctaneous, stoutish, on leafy peduncles 3-5 cm. long; staminate dense, 2-4 by 1.2 cm.; pistillate less dense, 3-7 cm. long, 1.2-1.5 cm. wide; scales oblong to ovate, obtuse, ^{yellowish} more or less villous outside; capsules lanceolate, 5-6 mm. long, green to brownish; pedicels 0.5-1 mm. long; styles ?

Introduced from Europe. Infrequently cultivated, mostly in parks and public grounds. Sparingly escaped northward. Wyo.: city parks in ^{Jackson} ~~Laramie~~ Teton Cos.

2. S. amygdaloides Andersson. Tree with 1-4 usually leaning trunks, 3-12 m. tall, color effect yellowish-green; glabrous throughout (except rachis and scales); twigs slender, yellowish, somewhat pendant; ^{petioles} ~~pistillate~~ slender, 5-20 mm. long, yellowish; leaves lanceolate, or broadly so, to sometimes ovate-lanceolate, 8-10 or 13 cm. long, 1.5-3 cm. wide, abruptly to gradually acuminate at apex, acutish to foveate at base, finely serrulate, yellowish-green above, subglauous to glaucous beneath, with tiny vein islets; aments coctaneous, linear, lax, 3-6 or 8 cm. long, 0.8-1.5 cm. wide, on leafy peduncles 1-3 or 4 cm. long; scales lanceolate or broader, pale yellow, crisp-villous within, deciduous; stamens 4-7, filaments free, pubescent below; capsules lanceolate, 4-5 mm. long; pedicels slender, 2 mm. long; styles 0.3-0.5 mm. long, stigmas shorter.

(on vigorous twigs)
bud scales 2-5 mm. long, yellowish; stipules ~~markedly marking~~ semi-ovate, through subreniform, to semi-lance, 3-8 or 12 mm. long; ~~stipules markedly marking~~

Alluvial stream banks and valleys, Pa. to NE. N.Y. and adjacent Que., west to so. B. C., and south, east of the Cascade Mts., ~~to~~ to Ariz., Tex., and Ky.

Wyo.: Sparingly throughout at low elevations: Laramie, Albany, Platte, Johnson-Sheridan, Fremont, and Teton Cos.

SECTION WOLFIANAE. WILLOWS OF WYOMING.

60

S. Wolfii Bebb. (Bot. Wheeler Exped. 241. 1878). / ^{Low clumpy} Shrub 0.5-1 or 1.5 m. slender, high; twigs yellowish to chestnut brown or brown, ascending to erect, leafy; mostly thinly pubescent; stipules small or wanting; leaves elliptic-lanceolate to elliptic-ob lanceolate, 2-4.5 cm. long, 8-13 mm. wide, entire, acute at apex, mostly rounded at base, / dull green and more or less silky-villous on both sides, sometimes becoming glabrate, submerged veins reticulate, darkened; petioles short, pubescent; aments coetaneous, leafy-short-peduncled, , 1-2 or 2.5 cm. long, sometimes exceeded by the peduncle leaves, dense, subglobose to oblong; scales obovate to oblanceolate, black, sparsely villous, 1.5-2 mm. long, persistent; stamens 2, filaments free, glabrous ?); capsules narrowly to broadly lanceolate, 3.5-5 mm. long, glabrous, greenish to reddish green; pedicels about 0.5 mm. long; styles variable, 0.5-1 mm. long, entire; stigmas short; gland ventral,

Bogs, swamps, and wet ground, at high elevations. Colo. and Utah (?) to Wyo., Idaho, and western Mont. Wyo.: Mountains from Albany and Sheridan Cos. westward.

var. *idahoensis* Ball (Bot. Gaz. 40: 378. 1905). Leaves larger, 3-6 cm. long, 1-1.8 cm. wide, usually more densely silky villous; aments longer, to 3-5 cm. long, and peduncles proportionate; capsules 5-6.5 mm. long, thinly to more densely silky-villous.

Northern and western part of the species range and west to Nevada and northeastern Orge.

(Man. Rocky Mtn. Bot. says Big Horn Mts. of Wyo. for var. *idahoensis*.)



THE UNIVERSITY OF WYOMING
ENGINEERING BUILDING
LARAMIE, WYOMING

November 6, 1944.

Dr. Carleton R. Ball,
Extension Service,
U. S. Department of Agriculture,
Washington, D. C.

Dear Dr. Ball:

Many thanks for your notes and identifications on the small batch of Willows we sent you. The specimens have been received in good condition and your notes attached to them for inclusion in our herbarium. Your findings are most interesting and certainly prove, again, that we have a lot to learn about the vegetation right here at home!

I am in the midst of trying to prepare an illustrated flora for Wyoming, and to date have worked out six of the less difficult families. Publication - at least for the present - is by duplicator, and we are making up about 100 sets for distribution. When the whole job is completed we hope to be able to blossom out in regular print, but in the mean time this system gives us workable information and will enable us to revise as we go along - all without undue expense. Several of our correspondents have kindly agreed to take on a genus or family in which each is a specialist (Thomas Howell the genus Carex and the Rubiaceae, etc.). I was wondering if you could be persuaded to take on the Willows? We can take care of illustrations and distributional maps, but I would very much like to have your expert help on this confusing group. Under separate cover I am mailing you a set of the contributions thus far completed to give you an idea of what is intended. As you will note, synonymy is not complete but only sufficient to establish names and steer folks in the right general direction.

With all good wishes, I am

Sincerely yours,

C. L. Porter

C. L. Porter, Curator
Rocky Mountain Herbarium

CLP/m

(over)

November 13, 1944

Professor C.L. Porter,
Rocky Mtn. Herbarium,
University of Wyoming, Laramie

Dear Professor Porter:

Your letter of November 6 is here, with the issues of Leaflets devoted to the Flora of Wyoming. I have scanned the letter and am much pleased with the form of the keys, and the natural-size illustrations. These last should be very helpful as most such work is all done to one size instead of to one scale. If I did not send you my paper on illustrating plant organs, I will.

In Leaflet 3, Orchidaceae, I note that the last genus, *Corallo-rhiza*, is keyed out first. That always seems to me to be a mistake and I noted no other instance of that kind in these Leaflets.

I note your request that I handle *Salix* for this series. As I did the genus for Coulter & Nelson in 1908, I suppose I ought to take a hand in this new effort. When I finish Alaska-Yukon and Illus. Flora, I must do Idaho and the Wyoming species are very similar. I would not be able to start on it until mid-1945, if that would do.

I forgot to say that I am delighted with your system of mapping distribution. It tells a lot and stimulates collectors to further effort. I am spot-mapping the distribution of southern willows by counties and hope that it will have that effect in the south, where some remarkable finds have been made recently, such as *S. cordata* in northern Alabama and extreme NW. Arkansas.

If and when I do Wyoming willows, I assume that I would have to see all the material in the Rocky Mtn. Herbarium. I determined much of that collected by Dr. Nelson through the years but there must be much more, and also I have learned a lot since 1908. When travel conditions return to normal, I probably will be driving west again. We have one warm personal friend at Laramie, Mrs. Geo. Hulse of the Univ. She is the daughter of our dearest friends, Mrs. and Mrs. Fred. L. Edmonds of Newtonville, Mass., and formerly of D.C.

Cordially yours,

Carleton R. Bell
Collaborator



THE UNIVERSITY OF WYOMING

ENGINEERING BUILDING

LARAMIE, WYOMING

November 21, 1944

Dr. Carleton R. Ball
Extension Service
U. S. Dept. of Agriculture
Washington, D. C.

Dear Dr. Ball:

It was, indeed, a pleasure to learn that you will be able to undertake the treatment of the Willows for our Wyoming Flora. Your part in this undertaking will add immeasurably to the whole since there is no one else who can write with the authority and extensive knowledge of this group as you. I shall be happy to ship you our material for study whenever you give the word - and mid-1945 will be fine if that suits your convenience. We can also send to illustrations and maps if you wish, with the aid of suggestions from you as to what should be illustrated.

Many thanks, too, for your helpful suggestions and comments on the portions of the work which have been completed. I like to know what people like and also what they dislike about it! Changes, when desirable, can then be made in the final revision for publication.

With all good wishes, I am

Sincerely yours,

C. L. Porter

C. L. Porter, Curator
Rocky Mountain Herbarium

CLP:cw

(over)

Dr. C.L. Porter,
Curator, Rocky Mtn. Herbarium,
Univ. of Wyoming, Laramie, Wyoming.

December 8, 1944

Dear Dr. Porter:

Your letter of November 21 was promptly received and I am glad that the arrangement will be satisfactory to you.

I wish to ask one more favor. In the specimens sent me some weeks ago, was one collection by C.L. Shear, from Mt. Blanca, July 31, 1900 (NO. 4282). I read the State name on the label as "Cal.", for California and so recorded it.

I can find no Mt. Blanca in California but do find one in Colorado. Shear was more likely to have been in Colorado than in California, in 1900.

Will you please scrutinize that label and let me know your judgement as to whether it represents "Cal." or "Col.".

Appreciating your courtesy, I am

Cordially yours,

Carleton R. Ball
Collaborator

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(over)

C. L. Shear
1219 No Oak St
Arlington



THE UNIVERSITY OF WYOMING
LARAMIE, WYOMING

February 25, 1948.

Dr. Carleton R. Ball
Extension Service
U. S. Department of Agriculture
Washington 25, D. C.

Dear Dr. Ball:

I am writing to inquire whether or not you would have the time to help us out on two or three problems in connection with our Willows.

One problem concerns a collection made by Dr. W. G. Solheim of our staff in the northern part of Wyoming in the Big Horns. We have several sheets of this strange looking thing in good fruit, and it had been laid aside for several years by Dr. Nelson as a possibly new species. That gentleman is no longer able to continue his botanical studies, and it seemed best that you have a chance to look it over and describe it if you see fit. The only stipulation would be that we should get the type, but isotypes could be deposited in a half dozen places at your discretion. Shall I send you this material?

A second problem concerns a collection of willows made in Teton County, near Moran, by Dr. John Reed, another staff member last summer. We should very much like to have this set of perhaps thirty sheets (rough guess) checked by you. We can supply you with a duplicate set of these to keep if you want them.

The third matter I believe I mentioned to you before and is concerned with the possibility of getting you to draw up a rough draft of a treatment on our Wyoming Willows for our flora which is in preparation. If we shipped you our Wyoming sheets, could you at least work out a key and annotate the sheets which are not correctly named? There would be no rush to complete the job.

All of which seems rather presumptuous on our part, but you must realize that you have brought this sort of thing on yourself by being so darned good on Willows that those of us who are inexperienced must depend on you for our information.

Sincerely,

C. L. Porter

C. L. Porter, Curator
Rocky Mountain Herbarium

(over)

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

Dr. C. L. Porter, Curator,
Rocky Mountain Herbarium,
University of Wyoming,
Laramie, Wyoming.

10 September, 1950

Dear Dr. Porter:

I am thoroughly ashamed (or completely discomfited, as we say in California. In going thro the accumulating flood of correspondence with Prof. E.C. Smith of Colorado A. & M. College, to check on some re-raised problems, I discovered your letter of Feby. 25, 1948, clipped to one of ~~your~~ of that month. his There is no indication thereon that it has ever been answered.

You asked for help on three problems, and there is no one I would rather have helped, because of the splendid cooperation the Rocky Mountain Herbarium has given me thro the years. One problem was some peculiar specimens collected by Solheim (I seem to recall that Kelso has named a "Solheimii"). Another was a collection from Teton Co., made by Dr. John F. Reed. I think I have done his in response to letters from him. He is doing a splendid work.

The third request was for help in the write-up for the new Flora. I would have been delighted to help on that. Is it too late now? During last winter I did the willows of Idaho for Dr. Davis of Botany at Pocatello and for Prof. Wilson of Forestry at the same College. Wyoming probably would not include more than a dozen additional species, I would think.

My write-up for the new Illustrated Flora of NE. U.S. was done last winter and I am now doing Alaska-Yukon for Dr. Andersson.

Let me hear from you if I can be of any possible use. I think Smith mentioned two or three specimens he had seen there which he thought I ought to see. If I can put my eye on that letter, I may send a post card after this letter.

Again expressing my keen regret for this wholly unintended rudeness, I am

Cordially yours,

Carleton R. Ball

See Smith Apr 13, 1948

(over)



THE UNIVERSITY OF WYOMING
LARAMIE, WYOMING

February 28, 1949.

Dr. Carleton R. Ball
3814 Jocelyn Street, N. W.
Washington 15, D. C.

Dear Dr. Ball:

About a year ago I wrote you concerning the possibility of getting you to check over a collection of Willows from Jackson Hole made by our Dr. John Reed, but since I received no answer I am guessing that probably my letter was not forwarded to you from your former official address with the Extension Service.

Dr. Reed has made an excellent collection of all the Willows he could get in the vicinity of the newly organized Jackson Hole Wildlife Park at Moran. He is an ecologist and is making a study of the plant communities in that area, and he and I would greatly appreciate having your determinations on his plants. We have named them to the best of our ability, but we are rank amateurs on Salix! We have duplicates of most of these mounted sheets which you may keep. May I sent them to you to be named at your convenience?

Another matter which we discussed before has to do with the possibility of getting you to draw up a rough draft of a treatment on Wyoming Willows for inclusion in our series of Contributions toward a Flora of Wyoming. I believe you agreed to attempt it. About all we would need would be a key based on material we can send, with a listing of currently used names and the commoner synonyms found in older books, along with approximate ranges of the species. I can do the final typing, illustrating, and see that it gets mimeographed for distribution. You would get as many copies to distribute as you would need.

I realize that all this seems a little presumptuous on our part, but I feel that no one else can do the job as well as you can, and I earnestly wish to have our flora worked out in the best possible way - which means the enlistment of help from you experts.

In the mean time - what is the status of the Salix glaucoops and S. pseudolappaceum mix-up? We have sheets which seem to be identical which are named both ways. Does all our Rocky Mt. material go to the latter? Is there any good S. glaucoops in this continent?

Trusting that all is going well with you and yours, I am

Sincerely yours,

C. L. Porter

C. L. Porter, Curator
Rocky Mountain Herbarium



THE UNIVERSITY OF WYOMING
LARAMIE, WYOMING

October 5, 1950.

Dr. Carleton R. Ball
3814 Jocelyn Street, N. W.
Washington 15, D.C.

Dear Dr. Ball:

Thank you most sincerely for your kind letter of September 10 in which you offered your assistance to us in connections with our Willows and particularly in the preparation of a treatment for our projected Wyoming Flora.

I didn't doubt for a minute that you would do all you could, and I fully realized - and still do - that you are extremely busy helping other folks who also take advantage of your extensive knowledge and experience with Willows. We shall be most grateful if you can work out some sort of a treatment for us, even though it is only a rough draft to include keys, sections, and synonymy, the last (synonymy) being one of our difficult problems. Citations would also help since I want to include them.

Enclosed is some information concerning our problems as we see them, together with a list of what we have in the way of species in the state in our collection, and the approximate number of sheets of each. Most of these folders we have cleaned up as best we could to bring them into agreement with your thinking, but there remain some mean little problems which we (Dr. Reed and I) did not feel we could answer.

I shall be glad to ship you, at our expense, of course) any or all our sheets so you can annotate them or at least sort them out for us to annotate for you. Perhaps you would like them part at a time. You could have them for as long as you wish, and you need not feel under pressure to get the job done in any specified time.

The Solheim collection from the Big Horns which I mentioned, I have called S. Tweedyi. But you may wish to look it over. It is in the mounted sheets and filed under that name now.

Sincerely yours,

C. L. Porter

C. L. Porter, Curator
Rocky Mountain Herbarium

CLP/ms

(See over)

Dr. C. L. Porter,
Rocky Mountain Herbarium,
University of Wyoming,
Laramie, Wyoming.

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

2 January, 1951.

Dear Dr. Porter:

I try to answer letter with the same half-century in which they are received but did not make it with yours of 5 October, 1950, altho I did write nearly 30 willow letters in the last half of December. I came to yours but it required some thinking and study.

I now have gone over your list of Wyoming specimens and of Wyoming problems. If I assume responsibility for results, I think that I should see the material, even if I had annotated it in years past. That would not apply to recent material from Reed, however, and it need not be sent

I inclose a list of the material you list, arranged by the recognized botanical sections of the genus, and would like to have them sent in that order. You can send in the first shipment the Fragiles, Incidiae, Triandrae, and Longifoliae, totalling 80 sheets, or the whole list totalling 190 sheets (unless your numbers included Reed's recent collections.

I am glad that you listed your problems as it enables to better understand the points that need attention. I could answer many of the questions now but it seems better to answer them in connection with the study of the confused material and my report to you on it.

I can say offhand, however, that I probably caused the confusion in *S. pseudomyrsinites* myself, perhaps elsewhere. I don't understand your *S. "glaucophylla"*, as this is an eastern species. You list no *S. pseudomonticola* and perhaps you have it under "glaucophylla", along with its variety *padophylla* (*padifolia*).

I wonder if you do not have *S. fragilis* L, the Crack Willow, related to *S. alba*, the White Willow. *S. fragilis* is the commonly planted tree willow in the Mormon areas of Utah, Colo., and Idaho, and surely must have crept into adjacent Wyoming. Perhaps Reed had it but I have not checked his lists to see.

As the material I have listed is all "old stuff", and mostly recently worked over by me (the species, not the Wyoming material), it should not take me long to annotate it and return it.

The same will be true of the other Sections except Glaucos, on which I am working now and will not ask for until I settle the basic problems and know what names to use.

S. Tweedyi is a very distinct species of Section *Chrysanthae*. You have no other species of it in Wyoming. It includes *S. Hookeriana* and *S. Piperi* of the Pacific Coast; *S. alexensis*, *S. amplifolia*, *S. Barrattiana*, and *S. Richardsonii* of North-west America, and *S. calicicola* of the Eastern Arctic, as well as others named by Fernald, and Raup.

With all good wishes for the New Year, I am

Cordially yours,

P.S. Just received Mrs. Nelson's annual letter. Sorry to know of Aven's plight.

Carleton R. Ball

Sent replies

173, 174, 175 on 2 Jan. 51

(over)

SOME PROBLEMS IN WYOMING WILLOWS

S. cordata
S. pseudocordata
S. pseudomyrsinites } are confused

S. planifolia
S. planifolia var. *Nelsonii* } how distinguished?

S. anglorum
S. anglorum var. *araioclada* Schn. } how distinguished? Does *S. petrophila* Rydb. become the species or the variety?

S. glauca
S. galucops
S. glaucophylla
S. pseudolapponum } are confused. "glaucops" seems to be a catchall name!

S. curtifolia And.
S. padophylla Rydb } are confused.

S. stricta (Anders.) Rydb.
S. desertorum Rich. } both go to desertorum ?

S. pseudomonticola } does not seem to be in Wyoming although its range is from Sask. to Colorado. ?

S. nivalis
S. saximontana
S. reticulata } are confused. Do they all equal *S. reticulata*?

S. lutea Nutt.
S. lutea var. *platyphylla* Ball
S. lutea var. *ligulifolia* Ball } how distinguished?

S. lutea
S. Mackenziana } how distinguished?

S. melanopsis
S. melanopsis var. *tenerrima* } how distinguished?

S. Nuttallii
S. Scouleriana } confused

S. Tweedyi (Bebb) Ball
S. Barclayi var. *rotundifolia* And. } Are these by any chance the same?

SALIX Wyoming folders and numbers of sheets (approx)

✓ <u>Salix alba</u>	1	✓ <u>Salix glaucophylla</u>	4
✓ <u>Salix amygdaloides</u>	12	✓ <u>Salix interior</u>	6
<u>Salix angulorum</u>	22	✓ <u>Salix lutea</u>	12
<u>Salix arctica</u>	1	✓ <u>Salix lutea</u> var. <u>ligulifolia</u>	2
✓ <u>Salix argophylla</u>	5	✓ <u>Salix melanopsis</u>	3
✓ <u>Salix barclayi</u>	6	✓ <u>Salix monochroma</u>	2
<u>Salix bebbiana</u>	50	✓ <u>Salix monticola</u>	23
<u>Salix brachycarpa</u>	10	<u>Salix nivalis</u>	6
<u>Salix candida</u>	4	✓ <u>Salix pentandra</u>	1
<u>Salix cascadiensis</u>	20	<u>Salix planifolia</u>	30
✓ <u>Salix caudata</u>	27	✓ <u>Salix pseudocordata</u>	8
✓ <u>Salix cordata</u>	9	<u>Salix pseudolapponum</u>	22
✓ <u>Salix curtiflora</u>	1	✓ <u>Salix pseudomyrsinitis</u>	12
<u>Salix dodgeana</u>	5	<u>Salix scopuleriana</u>	25
<u>Salix drummondiana</u> var. <u>subcoerulea</u>	15	<u>Salix stricta</u>	11
✓ <u>Salix exigua</u>	18	✓ <u>Salix tweedyi</u>	8
✓ <u>Salix fluviatilis</u>	13	✓ <u>Salix wolfii</u>	23
<u>Salix geyeriana</u>	44		

WILLOWS OF ROCKY MOUNTAIN HERBARIUM REQUESTED FOR STUDY

Sections and Species

Sheets.

Fragiles.

1. *S. alba* (also *S. fragilis* if any) 1

Incidae

- S. caudata* 27

Triandrae

- S. amygdaloides* 12

Longifoliae

4. *S. argophylla* 5
5. *S. exigua* 12
6. *S. "fluviatilis"* 13
7. *S. interior* 6
8. *S. melanopsis* 3
80

Cordatae.

9. *S. cordata* (now *S. rigida*) 9
10. *S. "cuttiflora"* 1
11. *S. lutea* 12
var. *ligulifolia* 2
12. *S. monochroma* 2
13. *S. pseudocordata* 8
14. *S. "pseudomyrsinites"* 12

Committatae

Wolfiae

16. *S. Barclayi* 6 15. *S. Wolfii* 23
17. *S. committata* (not listed by you)
18. *S. "glaucophylla"* 4
19. *S. monticola* 22

Chrysanthae

20. *S. Tweedyi* 8
110

Dr. C. L. Porter,
Rocky Mountain Herbarium,
University of Wyoming, Laramie.

12 February, 1951.

Dear Dr. Porter:

I am returning by express collect the carton of willows (*Fragiles*, *Incidae*, *Triandrae*, and *longifoliae*) which you sent me for review in connection with the Flora. All sheets have been annotated, those with any change in name have an annotation label attached. Tried to pack carefully and hope they arrive OK.

I inclose a list of the specimens, arranged by Sections, and by species and varieties thereunder. The following comments have developed from my study of the material, plus that in my herbarium and the U.S. Natl. Herb., with some scouting in the Forest Service Herbarium. For convenience, I arrange these notes in the same order as the list.

S. fragilis L. SECTION FRAGILES.

You have only the one Laramie specimen, which possibly has some admixture with *S. alba*. Many of the plants introduced in colonial days were European hybrids of these 2 species, and others were produced here. There are no Wyo. spec. in Herb. CRB. ~~Reed got one in U.S. Nat. Herb.~~ has 1199, typical *S. fragilis*.

S. alba L. You have none. I have none. Not yet looked in USNH. It is much less common than *S. fragilis*, especially in the West. None in USN Herb.

S. babylonica L. Weeping Willow. You have none. I have none. Not yet looked in USNH. It surely must be growing in some Wyoming cities, but it almost never escapes in the West.. USN Herb. has none.

SECTION INCIDAE (or PENTANDRAE)

S. pentandra L. (introduced). You have but one, from the Univ. Campus. I have one, coll. by O.J. Murie in City Square, Jackson, Teton Co., in 1941. Prof. Reed may be able to get a specimen for the Univ. Herb. Not yet looked in USNH. none.

S. caudata (Muttall) Heller. This is marked by young twigs, buds, petioles, and leaves fairly densely pubescent or puberulent. It is common in Idaho and northward, and is found in western Montana, and in the high Uintas of NE Utah. You sent none, and I have none in my Herb. at the Dept. I think that Reed got it in Teton Co., and will check on that. The trouble is that var. *Bryantiana*, presumably glabrous, will have sparse hairs on young twigs, buds and petioles, the seldom on leaves, and all usually become glabrous later. I have 2 quite hairy specimens from Larimer Co., Colo. and one of the hairiest *Bryantianas* is from Sheridan Co.

S. caudata, var. *Bryantiana* Tracelin. You sent many specimens and I have checked in the left margin where the same collections occur in my herb. and in the right margin where they are in the USNH. Other specimens in these two herbariums place it definitely in Sheridan and Big Horn Cos. and in Yellowstone National Park. I will write you separately regarding label discrepancies on some of these collections.

S. caudata, var. *parvifolia* Ball. A var. with very small leaves, found at high elevations. There were none in the specimens you sent. Reed got one (No. 1165) in Teton Co. in 1947. I seem not to have recorded any in my Herb. The USNH. has three: one (without number, as *S. Fendleriana*) from a Piney Creek (Sublette or Sheridan Cos.?) by J.G. Jeck in 1900, and two from Yellowstone Park. One (unnumbered, as *S. cordata* var. *angustata*) by J. M. Coulter, July, 1872; the other (406 as *S. lasiandra* var. *Fendleriana*) by J. N. Rose, Aug. 20, 1895). You may have some of these.

Reed's 976 from Teton Co., and 3054 from Sublette Co., were determined by me as *S. caudata* but, in the light of these critical studies, must now be placed in its var. *Bryantiana*.

Salix lasiandra Benth. This western species extends eastward to S.W. Colo. and to the Uintah Mts. of N.E. Utah but probably does not occur in Wyoming. There were no specimens in your shipment, none in my herb. or in the USN Herb. Reed's 2791, from Albany Co. in 1950, I determined as S. lasiandra because one apical leaf (all young) seemed definitely glaucous. As it seems not to occur in Wyoming, it should not be admitted as such an immature specimen. Perhaps Reed can relocate that plant in late July or later, when the leaves will be fullgrown and glaucous if it really is S. lasiandra.

Salix lasiandra, var. lanatifolia (Andersson) Bebb. This variety has hairy twigs, petioles and young blades. It has not turned up in Wyoming, and is more western and northern than its species.

Salix amygdaloides Andersson. Sparingly distributed over the State. Neither my herb. or the USN Herb. show any additional counties, tho each has an additional specimen from Platte Co.

SECTION LONGIFOLIAE

Salix interior Rowlee, var. pedicellata (Andersson) Ball. One specimen from Laramie is listed in your material. I have studied the ~~XXXXXX~~ material in the USN Herb. and in my herbarium. There are a few juvenile specimens in both but the weather has been so cloudy, foggy, and dark, that good microscopic work has been impossible for weeks. I think that it extends into the NE corner of the State and perhaps along the whole east side but will not be sure until later.

Salix exigua Nuttall (including the former var. lutescens (Rydberg) Schn.) Occurs throughout the State except at lower elevation in the eastern end, where S. interior var. pedicellata intrudes. The USN Herb. has several additional collections from Laramie Co. and others from Teton and Yellowstone N.P., which are not in your Herb. or mine. I have two additional frs around Cheyenne in Laramie Co. Final distribution awaits the determination of those possible S. interior specimens from the eastern counties. The ranges doubtless overlap somewhat.

S. exigua Nutt., var. nevadensis (Watson) Schn. As shown by the list of your material, this western variety intrudes into the western part of the State, one specimen reaching the eastern drainage on the ~~Snake~~ River. No others found in Herb. CRB. or USN Herb.

Salix melanopsis Nuttall. A western species which reaches into western Wyo. You have Sweetwater, Uinta, and Teton Co. specimens. The ~~USN~~ Herb. has the 7046, Aven Nelson, Bitter Creek, Sweetwater Co., which you did not send, and I have queried in my query letter. The USN Herb. has Tweedy 482 from Yellowstone N. P. in June, 1881. The Forest Serv. Herb. has one from Teton Co., H.B. Harris in 1913.

Salix melanopsis, var. tenerrima (Henderson) Ball. A narrow-leaved var. of which you sent no specimens. The U.S. Forest Serv. Herb. has C.H. McDonald 621 from Grey's River, Lincoln Co., also in CRB. Herb. CRB. also has O.J. Murie 5 and 59 from Snake River, Teton Co., in 1933. The USN Herb. has E.A. Mearns 4625 from Yellowstone N.P. in 1902. Reed collected several specimens in Teton Co. and one in Sublette Co. He also had S. melanopsis from both these Counties.

Salix melanopsis, var. Bolanderiana (Rowlee) Schneider. This hairy-leaved variety is common farther west but does not reach Wyoming.

All of these notes are made for my own information, of course, but I'm glad to share them with you. Sorry for the long delay, but we have been ice'd, and sleeted, and snowed, and fogged since early December and everything has been mixed up, including

Yours Cordially,

Carleton R. Ball

Dr. C. L. Porter,
Dept. of Botany, Univ. of Wyoming,
Laramie, Wyoming.

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

13 February, 1951.

Dear Dr. Porter:

Yesterday, I started a letter reporting on the willows in the first shipment for study of Wyoming material, for the projected Flora. There are several queries regarding certain specimens and it seems best to put them all together in a separate letter, to facilitate checking the specimens for reply.

Salix caudata (Nutt.) Heller, var. *Bryantiana* Ball & Bracelin.

1434. (as *S. lasiandra* var. *caudata*)

Labelled "Pole Creek, Aven Nelson, June 30, 1895" in R. M. Herb.

In U.S. N. Herb. the label reads "Cummins, July 26, 1895".

In your Gazetteer, Pole Creek occurs in both Albany and Laramie Cos. and Cummins in Albany Co., and there also is a difference in the dates.

737. (labelled *S. lasiandra*) in U.S. Natl. Herb.

Big Popo Agie River, Aven Nelson, Aug. 2, 1894.

This was not received from Rocky Mtn. Herb. in your shipment.

11331. (labelled as *S. monticola* ?).

Rocky Mtn. Herb. 122307.

Stream banks, Mountain View (Uinta Co.) Aven Nelson, May 29, 1900.

This is a mixture of var. *Bryantiana* with *S. lutea* Nutt.

Presumably they should be remounted on separate sheets, one as 11331 A and the other as 11331 B. I will be glad to know how they are renumbered.

(See also 6966 under *S. exigua* Nutt.)

7209. (recd as *S.*

in Herb. GRB.

Evanson, Uinta Co., Aven Nelson,

1900.

Not received from R. M. Herb.

6967. (as *S. barrattiana* Tweedy; annot "*S. Fendleriana* by GRB, 1907" (RM 55295))

Chug Creek, Albany Co., Aven Nelson, Aug. 1 (or 7), 1900. at alt

Nelson says, on second label on sheet in Herb. GRB, that this was taken from same bush as No. 4349, coll. in 1898, and det. by Reulise as *S. barrattiana* var. *Tweedyi*?, and that 4349 is in USN. Herb. I cannot find it there under any name. Do you have it?

Salix exigua Nuttall.

7177. (received unnamed in Herb. GRB. Annot as *S. melanopsis* ? by GRB in 1921. In clumps along bottoms, Kemmerer, Uinta Co. (now Lincoln Co.), Aven Nelson, June 13, 1900. This was not received from R.M. Herb. with 7176. (yng frt; very tiny leaf just starting; capsules thinly silky; scales few, narrowish).)

✓ 6966. A. *S. exigua* Nutt. (now 6966a) R.M. Herb. 42490.

Creek banks, Sand Creek, Albany Co., Aven Nelson, May 30, 1900.

This is a mixture with *S. lutea* Nutt. (See 11331 above) 6966b (217809)

I have designated *S. exigua* as 6966 A, and *S. lutea* as 6966 B, and assume that you will wish to have them remounted separately.

Salix melanopsis Nuttall

3102. Note that the two specimens from R.M. Herb. have two different dates in list

7046. Received unnamed in Herb. GRB. Annot. as *S. melanopsis* by GRB. in 1921. Banks of Bitter Creek, Steamboat Mt., Sweetwater Co., Aven Nelson, June 9, 1900. (yng frt; very tiny leaf just starting; capsules thinly silky; scales few, narrowish). Do you have it?

Dr. C. L. Porter,
Rocky Mountain Herbarium,
University of Wyoming, Laramie.

3814 30th St., N.W.,
Washington 18, D.C.

January, 1951.

Dear Dr. Porter:

Your letter of January 11, and the carton of willows by express, are both here. I am now studying the specimens and attaching annotation labels. This reminds me that I have not inquired definitely as to just what I have under taken, so here goes.

1. Are you preparing a Flora of Wyoming, or a revision of the Custer and Nelson Manual? If a State Flora, is Manual revision contemplated later?

2. Can you send me a sample of the treatment being given, as to form of keys, length and character of descriptions, and character and method of giving distribution, both for the State and for entire area.

3. Are important synonyms to be cited, and if so, just how and where?

If you can send me your treatment of some shrubby genus having several species included, it probably will answer these and most other questions. As the willow species and varieties are numerous, and variable, it usually takes rather more text and keying, per species, than for smaller and less variable groups. Will you be able to allow me relatively more space per species, if needed. The new Illustrated Flora did so, after seeing sample treatments.

I prefer two sets of keys, one based primarily on vegetative character, present thro most of the year, and the other on floral characters, usually only briefly present. How does this strike you? There will be two in *Idaho* Flora. You may have noted that Fernald had 4 separate sets of keys for *Salix* in the new Gray, and that the total pages devoted to these 4 initial keys, and some subordinate keys within the text treatment, was greater than the pages devoted to descriptions and other data in the text. I have never seen that occur before.

As I may have said before, I have done the willows for Davis' forthcoming Flora of Idaho, and that will cover the great majority of the species occurring in Wyoming, if that is all you will cover.

Cordially yours,

P. S. In order to get an accurate picture of distribution, I need the County where collected placed on each label, especially where data are purely local. For example, Nelson's 1434 is from Pole Creek. I can find no Pole Creek, but there is a Lodge Pole Creek in Laramie Co.

Carleton R. Ball

There are two specimens from a Chug Creek, one labelled Albany Co., the other with no county given. I can find no Chug Creek, but a Chugwater Creek in Laramie and Platte Cos. So it goes. Perhaps you can have the Counties looked before the next lot is shipped. It will cover the following Sections and species:

Section Cordatae: *S. lutea*, *S. mackenziana*, *S. cordata*, *S. pseudocordata*,
S. monochroma, *S. Farrae*, *S. ligulifolia*.

Section Insirolepis: *S. irrorata*, *S. lasirolepis*, (*S. Boiseana*, *S. Sandbergii*),

Section Wolfianae: *S. wolffii*, and var. *idahoensis*.

Section Commutatae: *S. Barclayi*, *S. commutata*, *S. pseudomonticola* (*padophylla*)

Section Chrysanthae: *S. Tweedyi*,
S. monticola,



THE UNIVERSITY OF WYOMING
LARAMIE, WYOMING

January 25, 1951.

Dear Dr. Ball

Under separate cover I am sending you a sample copy of a treatment I prepared of the Parsnip Family for Wyoming. This will, I believe, give you an idea as to the general sort of treatment we are aiming at. You will notice that we are not using descriptions of species - only genera, except to point out differences in subspecific entities. In the case of the Willows, I think it would be most useful to include fairly detailed descriptions of sections. Thus, with a description of the family, genera, sections, and keys which may be as detailed as you think desirable, plus what illustrations you think might be useful, the user should not have too much difficulty.

As to illustrations - I shall be glad to do these if you will perhaps mark suitable herbarium specimens to use as being typical, and indicate to me what parts would be best to include. I'm no artist, but I like to illustrate when possible to bring out a point.

You need not bother with making distribution maps, nor with stating the range of the species within the state - only give, if you will, the total range of the species in a general way. But to help you with locations as given, often inadequately, on the sheets, I have also sent you a Gazetteer for Wyoming which may be helpful.

Incidentally, the sample treatment I am sending was dittoed, whereas we are now using mimeograph exclusively, since it is then possible to run off more as we need them, and the copies have more permanence and better legibility. Eventually, of course, we hope to assemble the whole series into some sort of a book which some publisher will see fit to take on, or else we will have it lithographed.

The scope of the project is only to include Wyoming. I feel that the time has almost past when one can adequately treat large areas. But I am toying with the idea of getting out a general-purpose manual for the Rocky Mountains which will go only to the genus - since that is often sufficient for range and field men and for class work. We could assemble references to monographic treatments to supplement it. But that is another story entirely and does not affect the present plan.

Sincerely,

C. L. Porter

"Chug Creek" is the same as Chugwater Creek - southeastern Wyoming in Albany & Platte Counties.

Dr. G. L. Porter,
Rocky Mountain Herbarium,
University of Wyoming, Laramie.

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

12 February, 1951.

Dear Dr. Porter:

I am returning by express collect the carton of willows (*Fragiles*, *Incidae*, *Triandrae*, and *Longifoliae*) which you sent me for review in connection with the Flora. All sheets have been annotated, those with any change in name have an annotation label attached. Tried to pack carefully and hope they arrive OK.

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S. fragilis L. SECTION FRAGILES.

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S. alba L. You have none. I have none. Not yet looked in USNH. It is much less common than *S. fragilis*, especially in the West. None in USN Herb.

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SECTION INCIDAE cont'd.

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Salix melanopsis Nuttall. A western species which reaches into western Wyo. You have Sweetwater, Uinta, and Teton Co. specimens. The ~~USN~~ Herb. has the 7046, Aven Nelson, Bitter Creek, Sweetwater Co., which you did not send, and I have queried in my query letter. The USN Herb. has Tweedy 482 from Yellowstone N. P. in June, 1881. The Forest Serv. Herb. has one from Teton Co., H.B. Maris in 1913.

Salix melanopsis, var. tenerrima (Henderson) Ball. A narrow-leaved var. of which you sent no specimens. The U.S. Forest Serv. Herb. has C.H. McDonald 621 from Gray's River, Lincoln Co., also in CRB. Herb. CRB. also has O.J. Murie 5 and 59 from Snake River, Teton Co., in 1933. The USN Herb. has E.A. Mearns 4625 from Yellowstone N.P. in 1902. Reed collected several specimens in Teton Co. and one in Sublette Co. He also had S. melanopsis from both these Counties.

Salix melanopsis, var. Bolanderiana (Rowlee) Schneider. This hairy-leaved variety is common farther west but does not reach Wyoming.

All of these notes are made for my own information, of course, but I'm glad to share them with you. Sorry for the long delay, but we have been ice'd, and sleeted, and snowed, and fogged since early December and everything has been mixed up, including

Yours Cordially,

Carlton E. Ball

Dr. C. L. Porter,
Dept. of Botany, Univ. of Wyoming,
Laramie, Wyoming.

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

13 February, 1951.

Dear Dr. Porter:

Yesterday, I started a letter reporting on the willows in the first shipment for study of Wyoming material, for the projected Flora. There are several queries regarding certain specimens and it seems best to put them all together in a separate letter, to facilitate checking the specimens for reply.

Salix caudata (Nutt.) Heller, var. Bryantiana Ball & Bracelin.

1434. (as S. lasiandra var. caudata) (see SE Albany Co. (Baker 2 Mar) (R.M. Herb 5521)

Labelled "Pole Creek, Aven Nelson, June 30, 1895" in R. M. Herb.
In U.S. N. Herb. the label reads "Cummins, July 26, 1895".

In your Gazetteer, Pole Creek occurs in both Albany and Laramie Cos. and Cummins in Albany Co., and there also is a difference in the dates.

737. (labelled S. lasiandra) in U.S. Natl. Herb. (No) in R.M. H., Porter, 2 Mar)
Big Popo Agie River, Aven Nelson, Aug. 2, 1894.

This was not received from Rocky Mtn. Herb, in your shipment.

11331. (labelled as S. monticola (?). Rocky Mtn. Herb. 122307.

Stream banks, Mountain View (Uinta Co.) Aven Nelson, May 29, 1930.

This is a mixture of var. Bryantiana with S. lutea Nutt.

Presumably they should be remounted on separate sheets, one as 11331 A and the other as 11331 B. I will be glad to know how they are remembered.

(See also 6966 under S. exigua Nutt.)

7209. (read as S. lasiandra) in Herb. GRB.

Evanston, Uinta Co., Aven Nelson, 1900.

Not received from R. M. Herb.

670. (as S. Barrattiana Tweedy; annot "S. Fendleriana" by GRB, 1907 (RM 35295)

Chug Creek Albany Co., Elias Nelson Aug. 1 (or 7), 1900.

Nelson says, on second label on sheet in Herb. GRB. that this was taken from same bush as No. 4349, coll. in 1898, and det. by Rowles as S. Barrattiana var. Tweedyi?, and that 4349 is in USN. Herb. I cannot find it there under any name. Do you have it?

Salix exigua Nuttall.

7177. (received unnamed in Herb. GRB. Annot. as S. melanopsis ? by GRB in 1921.

In clumps along bottoms, Kemmerer, Uinta CO. (now Lincoln Co.), Aven Nelson, June 13, 1900. This was not received from R.M. Herb, with 7175. (yng frt; very tiny leaf just starting; capsules thinly silky; scales few, narrowish).

6966. A. S. exigua Nutt. R.M. Herb. 42490.

Creek banks, Sand Creek, Albany Co., Aven Nelson, May 30, 1900.

This is a mixture with S. lutea Nutt. (See 11331 above).

I have designated S. exigua as 6966 A, and S. lutea as 6966 B, and assume that you will wish to have them remounted separately. This was done

Salix melanopsis Nuttall

3102. Note that the two specimens from R.M. Herb. have two different dates in list

7046. Received unnamed in Herb. GRB. Annot. as S. melanopsis by GRB. in 1921.

Banks of Bitter Creek, Steamboat Mt., Sweetwater Co., Aven Nelson, June 9, 1900

Not received from R.M. Herb. (possibly hybrid with S. exigua by slight pubescence and scales narrow to broad, but denticulate). Do you have it?

Dr. C. L. Porter,
Rocky Mountain Herbarium,
University of Wyoming, Laramie, Wyo.

1117 Brooklyn St., N.W.,
Washington 15, D.C.,

27 February, 1951.

Dear Dr. Porter:

Woe is me, and you. I seem to have more "queries" regarding those *Longifoliae*, in addition to those in my letter of 13 Feby., sent with the list of determinations. One even seems to be a "query" about a previous query.

The last query in that letter was about No. 7046, Aven Nelson, *S. melanopsis*, from Sweetwater Co. I stated that I had not received it from the R. M. Her. and asked if you had it. Now I discover that that No. is entered under *S. exigua* in the list sent. There it is recorded as from Sand Creek, Albany Co., but with same collector and date. Will you please check and see if I listed a wrong locality, or if it really is from "Sand Creek, Albany Co."? *It was West in June.*

My juvenile specimen, from "Banks of Bitter Creek, Steamboat Mt., Sweetwater Co." is a toss-up between *S. exigua* and *S. melanopsis*. When naming a west-Wyo. specimen, I probably let the broadish and persistent scales influence me more than I would have done when naming one from Albany Co., but I did suggest a possible hybrid with *S. exigua*.

Now for my second woe! In typing my pencilled notes on some of the specimens, I find reference to a peculiar specimen requiring further study. If you will look under *S. exigua*, Carbon Co. (p. 3 of list), you will see that the first specimen, without collection number, was received unnamed, under Accession No. 51980. It was collected at Hanna, by Aven and Elias Nelson, in June, 1903, and is described as having ovaries and capsules.

My pencilled note, which I mention above, refers to a staminate specimen with the same label data but Accession No. 51978. My notes show also that the printed names of the two collectors had been deleted and the name "Aven Nelson" written in. This would not be important, but my notes show that the very small young leafs are rather closely serrulate and almost glabrous, although the petioles are puberulent. I queried if this could possibly be a specimen of *S. Goodingii* var. *variabilis* Ball of the Southwest. (twigs yellow) and suggested that it be examined to see if it had the 3-5 stamens of the *Nigrae*, instead of the 2 in *Longifoliae*.

But this specimen, Accession No. 51978, is not in the typed list. It may be a separate sheet or it may be mounted on the same sheet as the pistillate 51980. If you can find it, please have the number of stamens determined. The var. *variabilis* is not found anywhere near Wyoming but in Indian and pioneer country fragments of willows get carried far from their homes.

Sorry to trouble you, but - - -

Cordially yours,

Carleton R. Ball

P.S. Your letter of 22 Feby. has just come and I note that another shipment is on the way.

Don't worry about the annotation labels. Wyoming has been very generous to me over a long series of years, and that recent large series of Reed's collections puts me deeper in your debt.



THE UNIVERSITY OF WYOMING
LARAMIE, WYOMING

March 2, 1951.

Dr. C. R. Ball
3814 Jocelyn Street, N.W.
Washington 15, D.C.

Dear Dr. Ball:

The following are answers to the queries you made regarding the first batch of Willows you worked over for us.

Pertaining to letter of February 12.

Copied S. *babylonica* has been tried at various times in Laramie but without success. It winter-kills badly. But we should have it in the state at lower elevations - perhaps Sheridan and Platte Counties, and I shall try to look for it next summer. No specimens in our herb.

Pertaining to letter of February 13.

A. Nelson 1434 (Accession No. 5521) - S. *caudata* var. *Bryantiana* - Pole Creek is probably southeastern Albany County in this case, in the hills east of Laramie (about 8,300 ft.). Cummins is a ghost town in the same general area, now completely extinct.

noted on list A. Nelson 11331 (Accession No. 132307) has been divided as you suggested:
11331a - (Accession No. 132307) is S. *lutea*
11331b - (Accession No. 217808) is S. *caudata* var. *Bryantiana*

noted 737 - mentioned by you is apparently not in our collection unless badly misfiled. Nelson did not keep all his numbers here, apparently, especially in the earlier days.

noted Tweedy 3438 - this is the correct number for our specimen of S. *caudata* var. *Bryantiana*, not 3436 as seen by you in the U. S. Nat. Herb.

noted 7209 - mentioned by you is apparently not in our collection unless out of place.

noted 670 - mentioned by you is not in our herbarium, apparently. (S. *Barrattiana* Tweedyi)
number 4349

noted A. Nelson 245 (Accession No. 4032) - S. *exigua*. The U. S. Penal Reservation used to be at Laramie (now the Univ. Stock Farm!), but was later moved to Rawlins (Carbon County) in exchange for the University! So the data on both our sheet and that in the U. S. Nat. Herb are correct.

noted on list A. Nelson 6966 (Accession No. 42490) has been remounted as you suggested:
6966a (Accession No. 42490) is S. *exigua*
6966b (Accession No. 217809) is S. *lutea*

(over)

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

Dr. C. L. Porter,
Rocky Mountain Herbarium,
University of Wyoming, Laramie. 18 April, 1951.

Dear Dr. Porter:

I have just studied carefully your letter of March 2, answering the questions raised in my letter of 12, 13, and 27 Feby. These covered Sections *Fragiles*, *Madidae*, and *Longifoliae*. Triandrae. Many thanks for your pains-taking labors.

I have made record of the remounting of the two species mixed on single sheets and of the collection and accession numbers finally applied (11331a, *S. lutea*, remaining Acc. 132307, and 11331b, *S. caudata* var. *Bryantiana*, now Acc. 217808; also 6966a, *S. exigua* (2 sheets with Acc. Nos. unchanged), and 6966b, *S. lutea* (now Acc. No. 217809).

The problem of *S. caudata* var. *Bryantiana* 3438 in Rocky Mtn. Herb. and 3436 in USN Herb. does not seem important enough to follow up. The latter number may be an error, or it may be the correct number for a separate collection.

On the two sheets of 3102, *S. melanopsis*, I have made the year 1897 on both the sheets.

As the last item from my letter of 13 Feb., you record that 7046, *S. melanopsis*, A. Nelson, Banks of Bitter Creek, Steamboat Mt., Sweetwater Co., June 9, 1900, in Herb. Grb. is not found in the Rocky Mtn. Herb.

As the first item from my letter of 27 Feby., you record that 7046, *S. exigua*, Sand Creek, Albany Co., A. Nelson, June 9, 1900, is in that Herbarium.

As these two sheets have the same collector, collection number, and date, I feel that they both are the same thing. As I noted, I was doubtful of my determination of my specimen as *S. melanopsis* or a ~~xxx~~ hybrid with *S. exigua*.

The chief question is where Aven was on June 9, 1900. The lists show that he collected 7103, *S. lutea*, at Rush Ranch, Sweetwater Co., on June 10, 1900. He collected 7178, *S. ligulifolia*, at Kemmerer, now Lincoln Co., on June 13, 1900. He collected 7808, *S. lutea*, at Evanston, Uinta Co., on June 14, 1900. His note books may show where he was on June 9.

The doubtful specimen, Amession 51978, Aven Nelson, Hanna, Carbon Co., s.n., which accidentally was returned unnamed, and which you could not find, you apparently had laid out to return to me. You had attached a slip suggesting that it was *S. lutea*. I have determined it as very juvenile *S. amygdaloides*, and it will come back with this second shipment.

M.H. I note your statement that apparently Aven Nelson did not retain specimens of all of his early collections. Where I find specimens in the U.S. Natl. Herb. which you do not find there, we can do nothing about it. But where I find them in my Herb., I will be glad to return them if they do not turn up in later shipments. I will keep a list of them, and check each incoming shipment to determine if they are therein. Then at the end, I will know what to return.

Will mail this now, and check over the later correspondence and make reply thereto very presently.

Cordially yours,

Carleton R. Ball

not on list
A. Nelson 3102 - S. melanopsis (2 sheets) - according to Nelson's field book the date 1897 is correct, not 1900 as given on one sheet. I have noted this on our specimen.

See S. exigua in list
7046 mentioned by you has not been located in our collection (S. melanopsis).

Pertaining to letter of Feb. 27.

A. Nelson 7046 - S. exigua (det. Ball) is from Sand Creek, southern Albany County.

Aven & Elias Nelson s.n. (Accession No. 51980) - S. exigua (det. Ball), from Hanna, Carbon County. Our plants on this sheet are entirely pistillate, with young and old capsules. No staminate parts.

Accession No. 51978 can not be located, and is not on the same sheet as 51980 (see immediately above).

I believe that answers - or tried to - the various questions. Sorry I can't locate the few specimens you mentioned. Perhaps they will turn up as we go through the other groups.

Digitized by Hunt Institute for Botanical Documentation

Cordially,

C. L. Porter

C. L. Porter

Dr. C. L. Porter,
Rocky Mountain Herbarium,
Univ. of Wyoming, Laramie.

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

3 March, 1951.

Dear Dr. Porter:

I usually write manual treatments of *Salix* in rough draft, as I finish each section or group of sections. When I started to do this for Wyoming, several questions arose. Here they are.

1. Am I preparing manuscript for a printed volume (Flora of Wyo.), or a preliminary paper to appear as one of the processed leaflets? When I asked for a sample treatment, you sent me leaflet 16, on Apiaceae. In this, the species are separated by full keys but are not described. Synonyms are given with full citations of publication.

2. If my treatment is for such a paper, I will so prepare it, except that the species would be described. I note that your generic descriptions are broken into sentences, instead of being a series of clauses; separated by semicolons, as mine. Which shall I use, in either type of paper?/

3. If my treatment is for a final manual, several other questions will need decisions. As a basis for discussion, I inclose rough draft of *S. caudata* var., *S. pentandra*, *S. fragilis*, and *S. amygdaloides*. Please rewrite one species, at least, as you will wish to have them written. Here are some of the problems on which I need guidance.

4. Will the latin name of species (or variety) form the beginning of the first line? In the mss. should it be written in capitals, lower case underscored, or lower case plain?

5. Should common names (if any) be included? See *S. fragilis*. Probably half of the willows have common names in use.

6. Should each included species have a number, or only the native species? I have not numbered *S. pentandra* and *S. fragilis* in rough draft.

7. Should the descriptions be shortened? This can be done if required, but I am trying to make willows better known to students. Of course, there will be keys, both vegetative and floral.

8. In these keys, should only the sections be keyed out in advance, and the species in each section be keyed in the text covering those species? Or should there be a key to sections, followed by the two sets of keys to species, all three preceding the text?

9. In the descriptions, should any words (other than metric measures) be abbreviated (such as elev., ft., diam., etc)? The biggest problem is the points of the compass. Should I write S.W., or SW., or s.w., or sw.? Should east, west, north and south be abbreviated in giving distribution, and how? Likewise, northern, southern, southwestern, etc., etc?

10. Should all ranges be given in the same order of direction, or should trans-continental species be given in one way and regional or local species in another? See my treatment of *S. amygdaloides* and of *S. caudata* var. *Bryantiana* for examples.

11. If this is a manual treatment, how should Wyoming distribution be cited? In the leaflet, you give Wyoming counties in alphabetic order, including Yellowstone N.P., followed by the general range.

If you rewrite, part of this rough draft and send it to me, it will answer most of these questions.

Cordially yours,

P.S. Your second shipment has just arrived.

Carleton R. Ball



THE UNIVERSITY OF WYOMING
LARAMIE, WYOMING

March 16, 1951.

Dr. C. R. Ball
3814 Jocelyn Street, N.W.
Washington 15, D.C.

Dear Dr. Ball:

I am enclosing a set of maps for your convenience, and to give you a general idea of the way in which they will work out in the end. We plan to use this format for the maps (two to a page), but to save space and paper we shall probably put three or four species to a map by using different symbols in the final write-up. Some of the spots are guesses, but in the main I believe they are about as they should be.

As to the way in which your manuscript is to look - suit yourself, since I shall personally cut the stencils and will edit it to conform to our general format. The following points are of particular interest:

1. complete citation for each species, place of publication and date,
2. complete synonymy, also with citations to publications,
3. keys to species, but varieties usually discussed when individual species are discussed, pointing out there the essential differences.
4. we will be happy to have complete descriptions for species and varieties, even though they are not used in this series - we may later get out a more elaborate one of manual proportions,
5. any habitat notes if pertinent,
6. general range of the species for the world.

How you state ranges, or how you word descriptions is immaterial, just so a dub like I am can get the gist of it!

Common names are desirable, if well established, but I have not tried to pin a common name on every species.

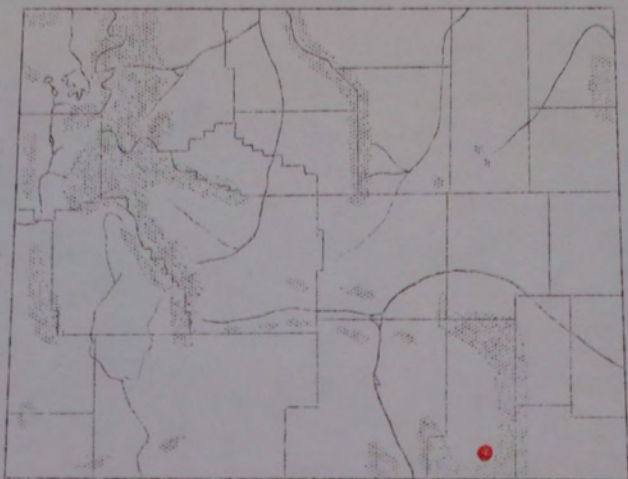
I am using metric system measurements throughout.

I prefer keys to sections, then descriptions of sections, then keys to species. But an artificial key (such as to mature vegetative plants) can seldom be constructed along these lines - so that could be directly to the species. Incidentally, the idea of the two sorts of keys, sexual and vegetative, is an excellent one. We even have hopes of eventually being able to add a third, to winter twigs! But that will take more study and many tagged plants.

Since we are using maps, I am no longer giving Wyoming distributions in writing, only referring to a map number.

Sincerely,

C. L. Porter



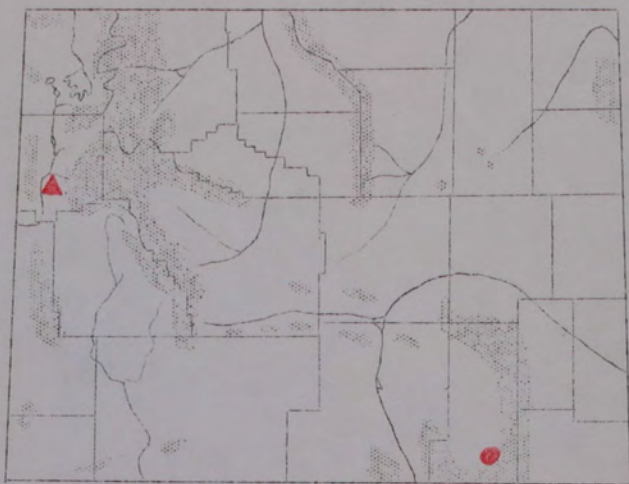
Salix fragilis L. FRAGILES

Digitized by Hunt Institute for Botanical Documentation



Salix babylonica L. FRAGILES

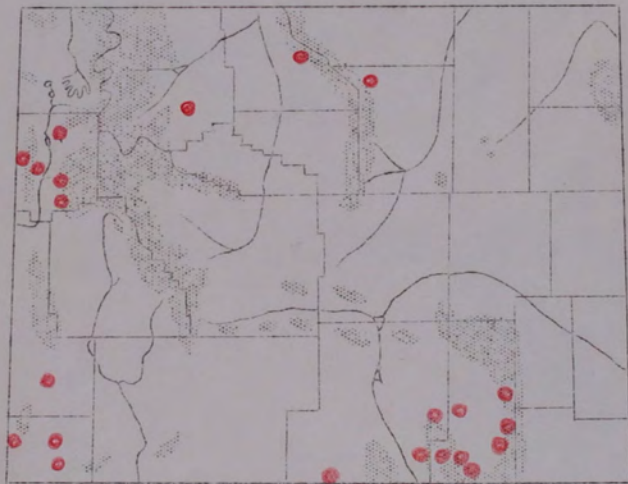
(to be expected at lower elevations)



● EM
▲ CRB

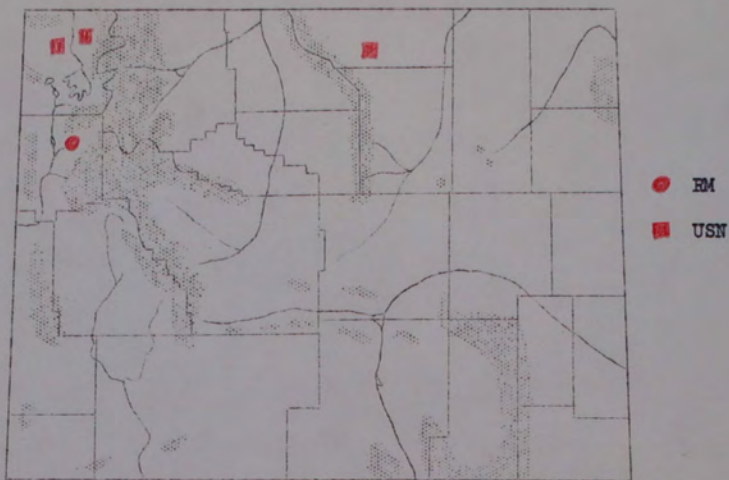
Salix pentandra L. LUCIDAE (PENTANDRAE)

Digitized by Hunt Institute for Botanical Documentation



● EM

Salix caudata (Nutt.) Heller LUCIDAE (PENTANDRAE)
var. Bryantiana Ball & Bracelin

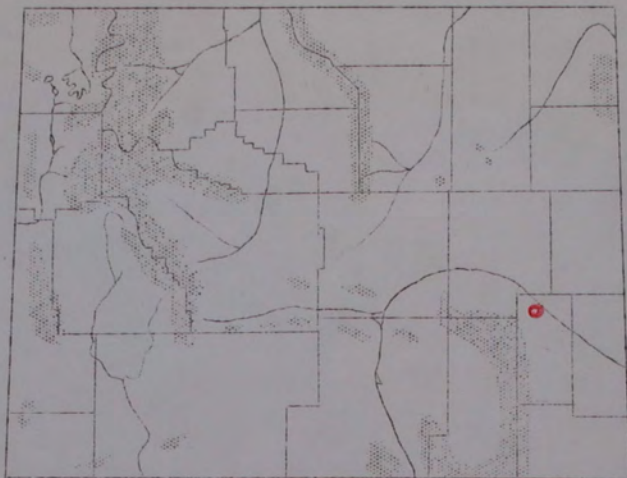


Salix caudata (Nutt.) Heller LUCIDAE (PENTANDRAE)
var. parvifolia Ball

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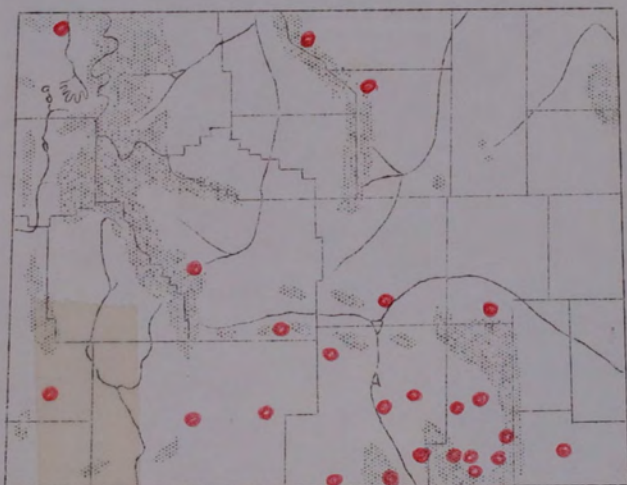
Salix amygdaloides Andersson LUCIDAE (PENTANDRAE)



RM

Salix interior Rowles LONGIFOLIAE
var. pedicellata (Andersson) Ball

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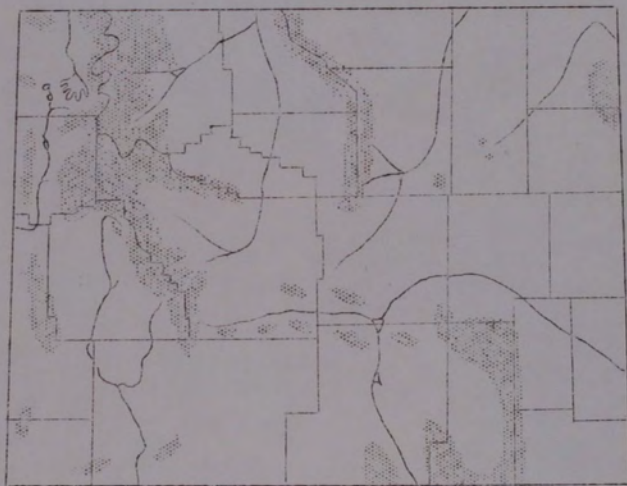
RM

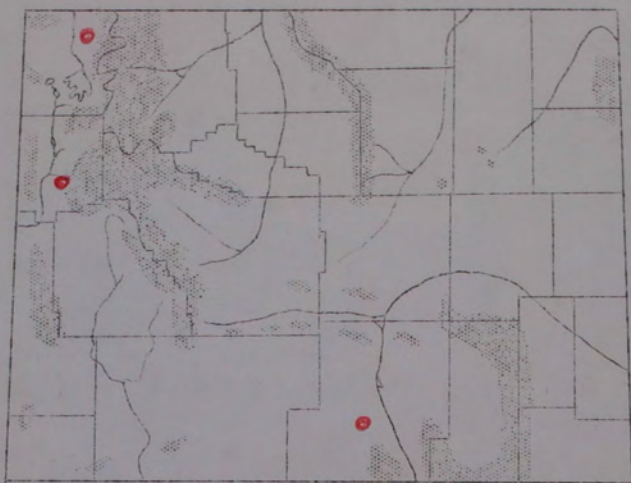
Salix exigua Nutt. LONGIFOLIAE



Salix melanopsis Nutt. LONGIFOLIAE
var. tenerrima (Henderson) Ball

Digitized by Hunt Institute for Botanical Documentation

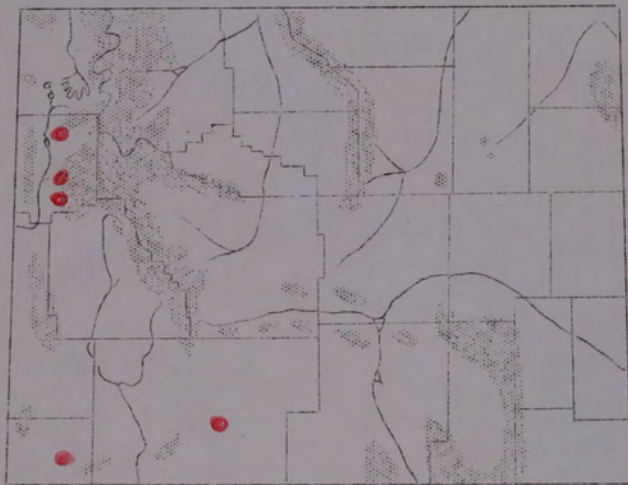




• RM

Salix exigua Nutt. LONGIFOLIAE
var. nevadensis (Wats.) Schn.

Digitized by Hunt Institute for Botanical Documentation



• RM

Salix melanopsis Nutt. LONGIFOLIAE

Dr. C. L. Porter,
Rocky Mountain Herbarium,
University of Wyoming,
Laramie, Wyoming.

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

19th March, 1951.

Dear Dr. Porter:

I inclose pages 6-12 of the listed specimens in the Rocky Mtn. Herbarium. They contain the Cordatae (*S. lutea* and vars., *S. ligulifolia*, *S. Mackenziana*, and *S. pseudocordata* and var.); also the Wolfianae (*S. Wolfii* and var.).

As I think I told you previously, this listing includes the Reed collections from 1947 to 1950, which were sent to me by him and presumably are all in the R.M. Herb.

I still am working on *S. monochroma*. It is a real puzzle and we sorely need a series of collection from the same plant, in each of several areas before I can know as much as I should. At present, I think that it does not occur in Wyoming, and but sparingly in southern Idaho. The leaves normally are much wider in proportion to length and the aments are longer, but there are many variations. By the way, I have collected vigorous summer shots of it with leaves to 5 or 6 inches long and 2.5-3 inches wide. If I find Wyo. material, I will send another page.

I have not found any *S. irrorata* from Wyoming as yet. I doubt if it occurs in the State, as collecting has been widespread and pretty thorough.

When I get these problems settled, I will send your carton back. Don't send me the next shipment for a month, or, better, not till I notify you. I want to catch up on some other work which is pressing.

I find that that I have not determined whether any of these listed specimens of *S. Wolfii* and var., *idahoensis* are in my Herb. or the U.S. Nat. Herb. Of course, the Reed specimens are all in mine and are so indicated. If I find that others in either Herb. I will let you know.

I think that I have a letter from you, replying to some of my queries but will not try to discuss it here.

There were several specimens in this shipment which belong in other sections but I am making no record of them as I assume that they will come back later in other shipments.

Hope that this third northwestern blizzard has not frozen you up. These seem to be like the two terrible ones of my boyhood on the Big Sioux River. One came on October 16-18, 1880, and snow us and the unpecked corn in for the winter. The other struck in the late afternoon of Feb. 12, 1882, and nearly 200 school children were frozen to death in a long line from southeastern Minn. to central Neb., when they were caught on the road home from school. I was luckier.

Cordially yours,

Carleton R. Ball

Dr. G. A. Porter,
Rocky Mountain Herbarium,
University of Wyoming, Laramie, Wyo.

4 April, 1951.

Dear Dr. Porter:

On March 19, I sent you pages 6-12 of the list of specimens in the R.M. Herbarium. These pages includes Sections Cordatae, lasiolepes, and Wolfianae.

I now have completed the study of the Wyoming specimens of those sections which are in the Herbarium here but were not in the material received from the R.M. Herb. The 6-page list is inclosed. This will enable you to know the counties and localities represented and so to prepare your distribution maps for these species.

At bottom of page 4, under Section lasiolepes, you will find discussion of my reasons for believing that *S. irrata* will not be found in Wyoming.

When I mailed you the list of R.M. H. specimens on Mar. 19 I had not finished listing the specimens of *S. Wolfii* and its var. *idahoensis* which were also in the other herbariums here and so the initials "GRB", "USN", etc. were not placed in the margins on pp. 11-12. Under *S. Wolfii*, and var. *idahoensis*, on pp. 4 and 5 of the list inclosed today, I have inserted a note for you, giving the numbers of any R.M.H. specimens which also are represented here.

At the bottom of p. 6 I have listed two Louis Williams specimens of *S. pseudocordata* var. *aqualis* which also are in GRB. Herb. but probably were not so initialed on the list sent you on March 19.

I have concluded that *S. monochroma* does not occur in Wyoming. A very few of the Teton Co. and Yellowstone Park collections approach it but none has both leaves and pistillate aments. On one sheet of supposed *S. monochroma*, you had attached a note asking me about Mearns 633, 1112, and 1263, from Yellowstone. No 1112 is *S. pseudocordata* but the two others must wait for sunny weather for final determination. No. 633 has prececius unfertilized aments and no leaf and can only be guessed at.

You asked also about 6101, Aven & Elias Nelson, from Yellowstone Park. It is a peculiar summer growth without aments. It was originally determined as *S. commutata* in my handwriting on the label of my specimen. Later, it was annotated as "*S. pyrifolia* var. *obscura* Andersson, for the Man. Rocky Mtn. Bot. Still later it was considered a var. of *S. monochroma*. I have looked at it again and think that it is sterile summer expression of *S. ~~monochroma~~ commutata* var. *demidata* Bebb. You should find it in the R.M. Herb. under one of the names given. I will study it again with the Section *Commatae*.

Among Idaho specimens you sent for determination were 3 sheets of G.N. Woods No. 243, from "Haley" (Hailey, Blaine Co.?). From my annotations you will note that these represent 2 sheets of *S. lutea* var. *platyphylla* (each bearing a twig of *S. pseudocordata*), and 1 sheet of *S. mackenziana* (with no admixture). I have attached a memorandum suggesting recounting the twigs of *S. pseudocordata*, and using A, B, and C to designate the 3 entities involved.

Apparently, when E.G. Smith annotated that sheet of *S. Geyeriana* from Fremont Co., he crossed out with ink the name on the original label. I hope that he did not do that to any other specimens. I cannot understand any one who deletes original data, even if he is right in his redetermination, which Smith was not in this case.

I now must get busy on some neglected work, but will try to read and answer the several letters I have received from you. Will reshipe the specimens soon.

Cordially yours,

Garleton R. Ball

Dr. C. L. Porter,
Rocky Mountain Herbarium,
Univ. of Wyoming, Laramie, Wyo.

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

7 April, 1951.

Dear Dr. Porter:

Since sending you, on April 4, the list of Cordatae and Wolfianae in herbariums other than the R.M. Herb., I have found two specimens of *S. Wolfii*, var. *idahoensis* Ball, filed in the wrong State cover. As one of them adds a new County to the Wyoming distribution, I give you the data on both.

43. Teton Co., O.J. Murie.

In Herb. CRS.

Just insert like No., 43, before his No. 41 on page 5 of list, as they both have same label data.

Park Co.

3549. (as *S. Wolfii* Bebb, var. *idahoensis*)

In Herb. CRIB.

Moist spruce woods near Crazy Woman Creek, Shoshone Natl. Forest, alt.

7000 ft., Louis O. Williams, Rna P. Williams, July 14, 1937.

(foliage; fruiting aments; capsules pubescent).

This last should be inserted at very bottom of page 6 and drawn up to a place just after Yellowstone Natl. Park. Its not very important but I like to have the records full and accurate.

Will try to get the carton repacked today and started to you on Monday.

Cordially yours,

Carleton R. Ball

Dr. G. L. Porter,
Rocky Mountain Herbarium,
University of Wyoming, Laramie.

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

18 April, 1951.

Dear Dr. Porter:

I have just studied carefully your letter of March 2, answering the questions raised in my letter of 12, 13, and 27 Feb'y. These covered Sections Fragiles, Ruoidae, and longifoliae. Triandrae. Many thanks for your pains-taking labors.

I have made record of the recounting of the two species mixed on single sheets and of the collection and accession numbers finally applied (11331a, *S. lutea*, remaining Acc. 132307, and 11331b, *S. caudata* var. *Bryantiana*, new Acc. 217808; also 6966a, *S. exigua* (2 sheets with Acc. Nos. unchanged), and 6966b, *S. lutea* (new Acc. No. 217809).

The problem of *S. caudata* var. *Bryantiana* 3438 in Rocky Mtn. Herb. and 3436 in USN Herb. does not seem important enough to follow up. The latter number may be an error, or it may be the correct number for a separate collection.

On the two sheets of 3102, *S. melanopsis*, I have made the year 1897 on both the sheets.

As the last item from my letter of 13 Feb., you record that 7045, *S. melanopsis*, A. Nelson, Banks of Bitter Creek, Steamboat Mt., Sweetwater Co., June 9, 1900, in Herb. Crb. is not found in the Rocky Mtn. Herb.

As the first item from my letter of 27 Feb'y., you record that 7046, *S. exigua*, Sand Creek, Albany Co., A. Nelson, June 9, 1900, is in that Herbarium.

As these two sheets have the same collector, collection number, and date, I feel that they both are the same thing. As I noted, I was doubtful of ~~the~~ my determination of my specimen as *S. melanopsis* or a ~~xxx~~ hybrid with *S. exigua*.

The chief question is where Aven was on June 9, 1900. The lists show that he collected 7103, *S. lutea*, at Bush Ranch, Sweetwater Co., on June 10, 1900. He collected 7178, *S. ligulifolia*, at Kemmerer, now Lincoln Co, on June 13, 1900. He collected 7208, *S. lutea*, at Evanston, Uinta Co., on June 14, 1900. His note books may show where where he was on June 9.

The doubtful specimen, Amession 51978, Aven Nelson, Hanna, Carbon Co., s.n., which accidentally was returned unnamed, and which you could not find, you apparently had laid out to return to me. You had attached a slip suggesting that it was *S. lutea*. I have determined it as very juvenile *S. amygdaloides*, and it will come back with this second shipment.

in RMH
I note your statement that apparently Aven Nelson did not retain specimens of all of his early collections. Where I find specimens in the U.S. Natl. Herb. which you do not find there, we can do nothing about it. But where I find them in my Herb., I will be glad to return them if they do not turn up in later shipments. I will keep a list of them, and check each incoming shipment to determine if they are therein. Then at the end, I will know what to return.

Will mail this now, and check over the later correspondence and make reply thereto very presently.

Cordially yours,

Carleton R. Ball

Dr. C. L. Porter,
Rocky Mountain Herbarium,
University of Wyoming,
Laramie, Wyoming.

3914 Jocelyn St., N.W.,
Washington 15, D.C.

August 18, 1951.

Dear Dr. Porter:

I have opened up the two cartons of Wyoming willows (mounted) for identification, and found them excellently tied and packed, and in perfect condition.

I have separated them into groups, by Sections of the Genus, and retied them. Because of another inquiry I have, I ran thro the numerous *Bebbiana* specimens first but have not yet annotated them.

Now I have finished the *Cordatae*, *Commutatae*, and *Chrysantheae*, the latter containing only *S. Tweedyi* and am inclosing the lists of specimens. As the *Cordatae* are a continuation of those sent previously, I have labelled the page 10 b, to follow the previous listing of this Section, if you wish to file it that way.

There were no specimens of *S. Barclayi* or *S. commutata* in this shipment. I will look up all the species in the other herbariums here and report when I get thro with your shipment. I am sure that *S. commutata* occurs sparingly in the western and north-central (Big Horns) part of the State, and *S. Barclayi* probably occurs along the western border.

One thing these specimens have taught me, and that is to get all of the material of Section *Cordatae* and the sections closely related to it (*Cordulifera*, *Rolfiana*, and *Commutatae*) all at the same time hereafter. There is so much confusion in determination made from the prevailing juvenile collections that they are sure to be mixed in herbariums. There was not a single specimen with mature leaves in *S. monticola* or *S. pseudomonticola* and variety.

Prof. Ralph R. Wilson, of the Idaho School of Forestry, tagged plants around Pocatello last year and collected from each one from 3 to 14 times during the year. You really learn something about willows from such series.

While the willows I report on today are but a small part of the total shipment, I feel that the remainder can be done rapidly because there are but one or two species per section, and these are easily distinguished, even in juvenile condition.

By the way, you did not send any material of Section *Reticulatae* (*S. nivalis*, *S. nivalis* var. *aximontana*). You may have *nivalis* in western mountains but most of it will be the variety. You may have intended not to send it, but I am leaving that to you.

Two of the specimens reported on have two species per sheet, and you may wish to rework them. They are 3083, *S. pseudocordata* var. *angustata*, and 4549, *S. monticola*).

Warm anon, with all good summer wishes, I am

Cordially yours,

P.S. Dr. Harold N. Moldenke, of N.Y. Bot. Garden, just tells me that he has resigned and would like a teaching job, or a research fellowship. I do not know what has happened but he has always seemed to me a most splendid man, who had helped to retrieve the reputation of the Garden. From the Editor.

Cordially

Carlton R. Ball

Dr. C. L. Porter,
Rocky Mountain Herbarium,
University of Wyoming,
Laramie, Wyoming.

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

24 August, 1951.

Dear Dr. Porter:

Here is the second installment of determinations of your August shipment of the RMH material. It covers pp. 15-19 and 22-25, and includes Sections Herbaceae (15-16), Ovalifoliae (17-18), Glaucos (in part, 19), Candidae (p. 22), Pellitae (22), and Phyllicifoliae (23-25).

Of the Glaucos, I have determined and listed only *S. brachycarpa* (p. 19). Pp. 20-21 are reserved for the *pseudolappinum-glaucops-desertorum* complex, on which I am doing some more work.

In Sections Ovalifoliae (*S. anglicum* and vers.) and Phyllicifoliae (*S. planifolia* and varieties), I have realized anew the tragedy of early flowering (precocious) and the extreme diversity of mountain habitats. It is very difficult to be sure of the varieties when they are based on leaf and plant differences and most of the material is juvenile and showing but one stage from a given plant. We sorely need tagged plants and successive collections from each, during a season, especially for mountain species in diverse habitats.

By the way, Prof. Ralph R. Wilson of Idaho State College, Pocatello, got from 3 to 12 successive collections from a series of trees and shrubs tagged in that vicinity. The result was amazing, and informing.

An occasional specimen I have designated as a probable hybrid. Possibly some others of them are. Where the anthers are hermaphrodite, I am not sure that hybridity always is the cause. Is that generally accepted as the cause in other families with dioecious flowers?

If I recall correctly, I had included the Reed collections in previous lists, as I had specimens of all and therefore you did not send them. This time I forgot to put them in. Sorry.

You all certainly have amassed a fine series of *S. caescaensis* from the Albany Coarea. And I note that *S. Dodgeana* has been found away from Electric Peak in the Yellowstone.

Will try to finish up the Discolares and Reutetae soon. There are numerous specimens in each Section but the determination should not be difficult. I am wondering if *S. flavescens* of the Rockies ought to be separated as a variety from *S. Scouleriana* of the Pacific Coast from Calif. to Alaska. The former has obovate and nearly glabrous leaves, but the range of variation in each is great.

We jump in temperature from 57 to 97, but it never rains.

Cordially yours,

Carleton R. Ball

Dr. C. L. Porter,
Rocky Mountain Herbarium,
University of Wyoming,
Laramie, Wyoming.

3314 Jocelyn St., N.W.,
Washington 15, D.C.

25 August, 1951.

Dear Dr. Porter:

I inclose pp. 26-35 of my determinations of the willows from the RMI, with notes primarily for my own information. This concludes the series of Sections. You will recall, however, that I did not complete Section Olancae. The specimens of *S. brachycarpa* Nutt. appear on p. 19, and the balance will compose pp. 20-21, after further study of *S. desertarum*.

I will return the specimens as soon as is possible. When I got out my annotation labels, I found I had but few. I ordered more last spring, in plenty of time but have discovered that my printer laid the order aside because of my statement that there was no rush and then he overlooked it. I called him about it and will get them soon.

I am by no means satisfied with this separation of *S. Bebbiana* and its var. *perseolata*. Most of the specimens have only juvenile leaves. The variety is supposed to have smaller, narrower, and thinner leaves, glabrate to glabrous when mature, and never really rugose but more or less reticulate beneath.

In the Wyoming material was every size and shape of leaf, and every degree of variation in the other characters. There were but one or two with the normal mature leaves of the species.

On pp. 22 (*S. Drummondiana* var. *subcoerulea*), add the following at bottom of page and draw it to form part of the record of 5541, under Yellowstone Natl. Park. It is based on a second sheet of this number, differently determined.

"5541. (2 sheets, as *S. Nuttallii*; 2nd sheet. (see above, in Yellowstone.) (twigs long, dark, some remnant-pruinose; leaves yagor and not discolored, sericeous as usual beneath; large pistillate aments in fl.; styles long, to ~~1.2~~ 1.2 mm."

Finally, I have found in *S. Geyeriana* a specimen which seems to be dominantly *S. Wolffii*, or a hybrid of it. This I will write up as p. 36 and send it to you presently.

Cordially yours,

P.S. I have been intending to ask you if you are a son, or other relative, of Dr. Thomas C. Porter.

Carlsten R. Ball

Dr. C. L. Parter, Rocky Mtn. Herbarium,
University of Wyoming,
Laramie, Wyoming.

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

27 August, 1951.

Dear Dr. Nelson:

When I wrote you on Aug. 25, I noted that description of an *S. Welfii* hybrid was yet to come. I now have completed it and think I would better mail it immediately before it gets lost in the shuffle.

You will note that it is page ¹² 4p, and I suggest that you change previous page ~~12 to 12a~~ to 12a, and insert this next after that, to keep the sequence complete.

We are dried out. Cloudy much of the time, and occasionally a few drops of rain. About 8 fell a few minutes ago but my hose is still on. Grass in the parks looks like winter or worse.

Cordially yours.

Carleton R. Ball

Dr. C. L. Porter,
Rocky Mountain Herbarium,
University of Wyoming,
Laramie, Wyoming.

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

11 September, 1951.

Dear Dr. Porter:

Your letter of Sept. 3 came some days ago but the packet of 10 willows arrived only yesterday. I have given the material immediate examination and inclose the determinations of the six sent as *Reticulatae*. At the bottom I have added a note about the other four, which shows that they belong to the *S. glauceps* complex of Section *Glaucæ*.

I sent you the determinations of only *S. brachycarpa* Nutt., in that Section, some time ago. I stated then that the *S. pseudolappinum*-*S. "glauceps"* specimens would have to be held for further study.

I expect to get my annotation labels from the printer very soon and then will add them to your big shipment and return it to you, including these six reported herewith.

At that time, with your permission, I will retain the "*glauceps*" material, including the four just sent to me, and report on them later. I will give you the list of Accession numbers so retained.

I am delighted to know that you and Dr. Reed are beginning to tag plants and to collect at intervals through the season. Such material is of immense value in helping to know species more completely, and to determine the valid expression of varieties. vt

Congratulations on the offer to become curator of the immense and famous Gray Herbarium. It does not come to many, and there were illustrious predecessors. I congratulate you also on having declined the offer. I think that you will never regret having decided to remain in the West. Not only is there an immense amount of opportunity to increase our knowledge of the plants of the western alpine areas, but there is no likelihood that one will get into any ruts in the west.

I strongly believe that it was the assumption that little remained to be done on their local floras, that drove so many European botanists to explore arctic America and publish countless new species of which they knew almost nothing. Then they left to American botanists the burden of finding out what they really had in hand and what should be done about it.

I believe also that this spirit has been pervading the eastern and some of the central herbariums, to the great disadvantage of sound botanical research. The Chicago Museum Herbarium seems to have somewhat numified in recent years and now they have ^{lost} Killip to the staff. (He was fired from the National Herbarium, primarily for drunkenness. For many years the work done by NY. Bot. Garden botanists was not good, and some of it not honest (see my paper on *S. floridana*). (see also my papers on some of Fernald's species based on single collections of what proved to be hybrid plants).

Appreciating your many services to me, I am

Most cordially,

Carleton R. Ball

Dr. C. L. Porter,
Rocky Mountain Herbarium,
University of Wyoming,
Laramie, Wyoming.

KX 3814 Locelyn St., N.W.,
Washington 15, D.C.

29 September, 1951.

Dear Dr. Porter:

I finally got my determination labels from the printer and have added them, where necessary, to the sheets in the two cartons sent to me last August. The cartons have been repacked, sealed, and strongly tied together with the cord that you so kindly inclosed with the shipment. They will start back by express next Monday, Oct. 1, and I trust that they will arrive safely.

As I mentioned in my last letter, I have retained specimens of *Sections Glaucæ*, other than *S. brachycarpa* and its varieties. There are 24 sheets, 21 of which were sent under *S. pseudolappinum*, and 4 sent recently with the *Reticulatae*, under "*S. glaucophylla*". Here are the accession numbers of these.

Accession Numbers of 4 specimens under "*S. glaucophylla*".

8956, 42483, 70862, 88750.

Accession Numbers of 21 specimens sent under *S. pseudolappinum*

8945,	68752,	103824,	166312,
36238,	94341 (illeg.)	103825,	176959,
36239,	94342 (illeg.)	103858,	176960,
36240,	97947,	135204,	176963,
69152,	97949,	138368,	177570,
			215219.

I trust that you will be willing to charge me anew with these 25 specimens, after you have received and checked the material in the two cartons.

I will start working on that *Glaucæ* complex very shortly now, as I have to arrive at conclusions before I can finish my Alaska-Yukon manuscript.

If you have any extra rain, please send us some. August and Sept. for short of normal. Crabgrass seedlings have died but nimble-will, with many leaves dead, has seeded steadily through the drought. It pays to be a weed.

Cordially yours,

Carleton R. Ball

Dr. G. L. Porter,
Rocky Mountain Herbarium,
Univ. Wyoming, Laramie, Wyo.

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

18 October, 1951.

Dear Dr. Porter:

Your letter of 11 Oct. came promptly, and the packet of 11 *S. "stricta"* arrived safely. I have determined them today and inclose list of determinations. All are *S. brachycarpa* Nuttall. The remarkable thing about them is that, in these 11 specimens you get almost the whole range of developmental and ecological variation in the species, except that there are none of those which simulate *S. glaucops* and cause gray hairs in deciding which one has in hand. You will note that I had received a specimen of 7831, Nash's Fork, in a previous shipment.

I am taking the liberty of returning these specimens by mail today. It will be some time before I have settled all the problems in the desertum-glaucops complex. At this time of year, material pours in and I like to clear it out as fast as possible. I don't know how many sheets I named in 1950, but my accession records show that I received 1172 duplicates for my own herbarium, and I determined many that were returned. hundreds

The whole question of "diamond" willows has blown wide open, and I now have authentic specimens of *S. Bebbiana* from Alaska and northern Alberta, and of *S. discolor* from the latter area. Formerly these "diamonds" were supposed to be restricted to the Section *Cordatae* (*S. lutea* et al) and the nearly related *Chrysaeanthae* (*S. alaxensis*), which Section also contain *S. Tweedyi*. *S. discolor* and *S. Bebbiana* belong to two Sections as far removed from the *Cordatae* as willows can get.

I am glad that you got the Hapeman herbarium. I seem to recall naming some willows from him many years ago, but have not looked up old files.

I will be glad to see the 1951 collections you mention, including *S. baby-lonica*. It is likely that *S. fragilis* and *S. alba* also are introduced here and there in Wyoming.

Thanks for the postscript telling me that Camel Rock is in southern Albany Co.

Weather here still very dry, and far below normal for 3 months. I make a big compost heap of soft maple and elm leaves each year (about 125 tramped-tight bushel-baskets full, which produce 40-50 bushels of black leaf mold in 12 months). I keep the compost wet to hasten rotting. In this dry year, the bordering trees and shrubs needed water and sent their roots all thro the rotting leaf to get it. I never had such hard work getting them out of the leaf mold. You could pick up bundles as big as pillows and as tight as if tied with cord.

I may have mentioned before that Texas had the longest, severest drought this year ever recorded by Weather Bureau. Some specimens of *S. caroliniana* (*S. Wardii*) from western Texas had autumn growth on which the leaves should have been 5 inches long and an inch wide, but were merely midribs about 2 inches long with no blades but just a narrow fringe along the midrib. That, of course, is a new "species".

Hoping that you are the same, I am

Cordially yours,

Carleton R. Ball



THE UNIVERSITY OF WYOMING
LARAMIE, WYOMING

January 23, 1952.

Dr. Carleton R. Ball
3814 Jocelyn Street, N. W.
Washington 15, D.C.

Dear Dr. Ball:

My correspondence has suffered due to the pressing nature of a number of chores that just had to be done. Sorry.

I am happy to have had enough duplicate material to be able to give you a set of the willows you so kindly named for me recently. It was a pleasure to pass them along.

Your letter of 17 December was a joy! I appreciate very much the friendly spirit expressed in it. Furthermore I shall - and have - exercise what judgment I possess in the matter of smoking. As with eating, exercising, and other such - my father-in-law's advice has always been to use moderation. A pipe does help with the mosquito problem, however!

But I fear you are deluded about my age, and that of the good wife! We already have three children, two of them (boys) being juniors and senior in college here, and we have a girl who is a junior in high school. So please don't look for additions! Marj, my wife, is the daughter of a retired violinist in the Chicago Symphony Orchestra. We were married in the spring of 1929 and came to Wyoming that year. The western climate, good food, mutual esteem, and not too many worries keep us youthful!

Now for asking a favor. One of my graduate students is working on a project for the game and fish department, and others, which is to be a semi-popular treatment of the shrubs of Wyoming. I am wondering if you could help us to the extent of furnishing a rough-draft of a key to sections and species of willows. Not a finished job such as you are undertaking for the Flora, but just a general usable key, preferably based on vegetative characters as much as practicable. We can then make up details from our specimens. If it not possible to get to sections on vegetative characters, a wholly artificial key to species would be desirable.

With all good wishes for the New Year,

Sincerely,

C. L. Porter

(see over)

*My friends call me
why don't you?*

Red

We hear from the John Reeds about once a week. They are having a lot of unusual experiences, are somewhat homesick, love to get mail, and will be delighted to get back to Wyoming. Their address is:

Dr. John F. Reed
c/o INEAC / ECA, Mission Mosso
Ruyigi par Kitega
Ruanda-Urundi
Belgian Congo

Digitized by Hunt Institute for Botanical Documentation



THE UNIVERSITY OF WYOMING
LARAMIE, WYOMING

September 26, 1952.

Dr. C. R. Ball
3814 Jocelyn Street, N. W.
Washington 15, D.C.

Dear Dr. Ball:

Your kind note of 6 September came in while I was taking a couple of weeks of vacation painting my house. Sorry for the delay.

It is good to hear that you are making progress with the difficult Section Glaucæ, and I am happy to learn that the number of species will be somewhat lessened by your efforts. There is no immediate hurry about returning our sheets of that group which you have - keep them as long as you need them.

We also have three folders I should like to get ordered up: one large one of S. glauca, including mostly arctic material from Alaska, Greenland, northern Canada, etc.; one which has been labeled S. glaucophylla, and including Colorado and other material you once annotated as S. glaucops; and a third one which was labeled S. stricta, but which appears to me to go to S. desertorum. None of these includes any Wyoming sheets, but if you want to look any of them over we would like your opinion. The S. glauca series I would guess to be correct, but I am not sure of the others. Some 77 sheets are involved in all three.

This summer I concentrated on aquatic plants, and have discovered that such things are likely to be overlooked by the average collector. So I am trying to learn the mysteries of Potamogeton, etc. They really are not as bad as they have been painted! But I did manage to get a few willows, and I shall send samples along as soon as I get labels made for the sets.

My graduate student finished his thesis on shrubs of Wyoming, but he omitted all willows as complicating his problem too greatly. As it was he had one of the largest theses we have produced to date. I hope you did not think that I was asking for you to do his work for him.

This is one of the most beautiful autumns we have experienced here. Wish you were here to enjoy it, although I know the east can be beautiful as well. On the other hand we have picnics of elk steak!

Sincerely,

C. L. Porter

C. L. Porter, Curator
Rocky Mountain Herbarium

84

Prof. C. L. Porter,
Rocky Mountain Herbarium,
University of Wyoming,
Laramie, Wyoming.

3614 Jocelyn St., N.W.,
Washington 15, D.C.,

3 December, 1952.

Dear Professor Porter:

Your letter of 18 November, and the packet of willows from Wyoming, Colorado, and Utah, were duly received, the latter in excellent condition.

I am inclosing the list of determinations, with your label notes and some notes of my own added in parentheses. I am sorry to have been delayed in reporting on these but I have been unusually loaded this fall (I almost said "winter" because it has been very cold, with two snow storms, which usually held off until late December).

It is very kind of you to let me keep the recurrent series of specimens I determine and I assure you again that I always quite willing to determine those which are to be returned. I always learn from the study, and the lists, which I file by States, are often useful to me in checking distribution and preparing manuscripts.

But I was astounded to find this set of specimens mounted for me, through your kindness. I think that it is the first time it has happened, in my long experience. I am willing to accept them mounted this time but feel quite strongly that you should not do it again. Most of the time I keep up-to-date on my mounting, but I am a bit behind just now because I have been trying to do some writing in the sociology field.

Trusting that all goes well with you, and with best wishes for the coming Christmastide, I am

Cordially yours,

P.S. I see that I have not thanked you for thinking of me in connection with the mounting of the willows. I do greatly appreciate your thoughtfulness in the matter.

Carlsten R. Hall

Wyo

86

Dr. G. L. Porter,
Dept. of Botany, Univ. of Wyoming,
Laramie, Wyoming.

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

15, December, 1953.

Dear Dr. Porter:

Your letter of 1 December, and the packet of 6 Wyo. willows, came promptly and in good condition. I'm sorry that report has been so long delayed. Glad to see that you have tried and succeeded in naming them, or most of them. Here they are:

- 6248. *Salix monticola* Bobb. ((OK)
Western Laramie Co. Shrubs to 8 ft. high, with yellow twigs and leaflets glaucous beneath. Middle fork of Crow Creek, Laramie Mts. 8200 ft. June 24, 1953.
(twigs mostly darkened, but long styles take it from *S. lutea* & *mckenziei*)
- 6353. *S. pseudocordata* (Andersson) Rydberg. (OK)
Northern Fremont Co. along Big Wind River, (Moose Study Area) 15 miles west of Dubois, 7800 ft. Shrubs to 5 feet high. August 3, 1953.
(normal foliage; green both sides).
- 6354. *S. Ferrae* Ball. (not *S. planifolia*)
As last. Shrubs to 5 ft. high. (leaflets look like those of *S. planifolia* but lateral veins are angular and not parallel)
- 6355. *S. Wolfii* Bobb. (OK)
As last but lvs shrubs to 2 feet high, but extensively browsed by moose.
(fairly typical but leaves smaller than average).
- 6356. *S. Dumortiana* Barrett, var. *subcaerulea* (Piper) Ball (not *S. Ceyeriana*)
As 6355 but lvs shrubs to 3 ft. high, but extensively browsed by moose.
Young twigs glaucous. (Leaflets are narrower than normal but the dense satiny covering of the leaflets below is different from the grayish pubescence of *S. Ceyeriana*, and this also has the characteristic perfume odor).
- 6419. *S. pseudomonticola* Ball (perhaps var. *pedophylla* (Rydberg) Ball.
Albany Co. Tree-like shrubs to 15 ft. high, along the Little Laramie River on the Frank Greenberg Ranch near Miller Creek. 7800 ft. Aug. 19, 1953.
(The var. is separated by the pedunculate aments, and without them is not certainly identifiable).

Keep all Jan.

You did not say whether these were to be returned or kept by me. Either is wholly satisfactory to me, as you know. But to save the packings and shipments, if they were intended for me, I'll just hold them until I hear from you.

I have been swamped with some outside duties but expect to get back to *Salix* strongly after the New Year. Got most of the glaucous problems settled before I had to stop. At post 80, I would better get busy.

I trust that all is going well with you and give our very best wishes for a happy Christmaside and joyous and busy New Year, and all the years that follow.

P.S. I will be much interested in any Cordially yours,
further notes on moose usage of the different species.
Have a full paper on uses under way.

Carlsten R. Ball

Dr. C. L. Parter,
Dept. of Botany, Univ. of Wyoming,
Laramie, Wyoming.

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

5 May, 1954.

My dear Ted: (you asked for it).

I have just discovered that my criminal carelessness has misplaced a bunch of letters received from you and some never answered. I owe you at least 1,004 apologies because you asked for some help which I would have been glad to give and to which you were fully entitled by reason of your long-continued kindness and generosity to me. I will now go thru them and see what I can do.

From your letter of Jan. 23, 1952, I am delighted to have the personal data about your family. The need of your graduate student for a key to the sections and species of Wyoming, I should have met. I would have suggested that most of the needed keys were in my treatment of Idaho Willows (Davis: Flora of Idaho) and that I would key out such species as did not extend into Idaho. But in your letter of September 26, 1952 you state that he omitted the willows and finished his thesis. That makes me more than ever ashamed of my neglect.

You also gave me the requested address of the John Reeds in the Belgian Congo, but they did not get written to. Mea culpa. Where are they now?

In your letter of 26 Sept., 1952, you refer to the sheets of Wyoming Glaucous which I have from you. I presume they still are here and will look them up. You also say that you have three folders of Glaucous from outside Wyoming which you like to get straightened out. If you care to send them on (77 sheets then), I will be glad to give them immediate attention and return them and the others (if here).

In your letter of 11 December, 1952, you suggest that No. 6006, identified by me as *S. planifolia* Pursh, may really be *S. Bebbiana* Sargent. I have just looked at it and the correct determination is *S. Bebbiana* Sargent, var. *perrestrata* (Rydb.) Schneider. Now I came to name it as *S. planifolia* I shall never know. The fact that it had foliage only had nothing to do with my error because I specialize on foliage determinations. The venation of the two species is quite different and this is typical of the *Bebbiana* variety. I inclose correct label, if you wish to use it.

With your letter of Dec. 1, 1953, you sent some willows from a meese-study area of the Game and Fish Dept., as part of a meese browse study. I have copied the browse notes from the labels but if the G. & F. Dept. has published since on meese feed, I will be glad to have a reference to their publication.

In your letter of Jan. 7, 1954, you ask for the names under which Nelson 7824 and Nelson 6098 (both *S. Ferrae* Ball) were distributed. These in my herbarium were received unnamed. Will look up these in the U.S. Natl. Herb. next time I go down there. You refer also to a few willows in collection on St. Paul Id. by a former student. Will be glad to see them if you wish to send with the Glaucous.

This brings my neglected series up to date, I think. Again I apologize and trust that you will forgive me.

Cordially yours,

P.S. How do you get "Ted" out of "C. L."?

Carleton R. Ball



THE UNIVERSITY OF WYOMING
LARAMIE, WYOMING

October 12, 1954.

Dr. C. R. Ball
3814 Jocelyn Street, N. W.
Washington 15, D. C.

Dear Dr. Ball:

Your good letter of May 5 arrived just in the midst of getting the last of our school work completed, and since then I have been in the field working over mainly aquatics from Colorado to Montana and as far west as the Oregon coast. I did collect a few willows, however, and have named them tentatively. But I would like your opinion on these so am sending you a small parcel containing three numbers. Please keep the specimens.

I checked over the sheets of *Glaucos* from outside Wyoming, and have got them more or less aligned with your treatment in the Idaho Flora. Most of them went to "*glaucops*" - a name which may be convenient at this time but which I feel can hardly be more than a catch-all. Do you admit any *S. glauca* L. in North America?

I believe you still have 11 sheets of ours which went to you with what had been called *S. stricta* and *S. desertorum*. Some of those you returned and called *S. brachycarpa*, but you retained the rest for further study.

The Game and Fish Dept. has not published on their moose study, and will not do so until they have a lot more data. The problem concerns the possible competition between moose and cattle on winter range, and involves a disagreement between game management ideas and those of the cattlemen.

The Reeds are back here now after a very strenuous year in Africa. They found living conditions much more primitive than anticipated, and the health of some of the family suffered - mainly from malaria etc.

One thing I would deeply appreciate if you could do it for us: a key to sections of Wyoming willows, brief descriptions of the sections, and keys to species under each section. I like to think in terms of groups rather than single species as is done in recent keys. Aren't the sections clear-cut enough to warrant such a treatment? And would not our concepts be strengthened by such a treatment? I hope this is not too much to ask. We need the information only you can supply so desperately!

Sincerely,

Ted,

C. L. Porter

PS: I have no idea where "Ted" came from. A parental whim, no doubt, which antedates my memory.

Dr. T. C. Porter,
Dept. Botany, Univ. of Wyoming,
Laramie, Wyoming.

3814 Jocelyn St., N.W.,
Washington 16, D.C.

19 October, 1954.

Dear Dr. Porter:

Your letter of Oct. 12 and packet with 3 willows promptly received. Congratulations on having named them correctly, and many thanks for permission to keep the specimens. It is highly gratifying to find some one studying willows enough to name them. The list (for my State file) is as follows:

- WYOMING. Southern Carbon Co. T.C. Porter, April June 24, 1954.
6478. *Salix pseudocordata* (Andersson) Rydberg. 000
Shrubs to 8 ft high in wet places. Battle Lake, Sierra Madre Range, 9899 ft.
6479. *S. pseudocordata* (Andersson) Rydberg. As 6478.
6480. *S. Scouleriana* var. *parrattii*.
Shrubs about 8 ft. high at edge of Spruce-Fir forest near the Continental Divide south of Bridger Peak, el. 9500 ft.

It seems probable that the name *pseudocordata* will have to be dropped. It was published without explanation, to replace his earlier *S. curtiflora*. Unless that was a synonym, it will have to stand. Both Bebb and Schneider have voiced the suspicion that the type specimen really represents *S. myrtillifolia* Anders. I will go at these problems presently.

Glad to know of your extensive summer activities, the status of the meadow-browse study, and the safe return of the Beeds. I trust that the malarial effects on their health will soon disappear. My regards to them.

Many thanks for reminding me of my neglect of 11 of your Glaucous specimens. I am driving hard to finish my manuscript on the willows of Nevada. When it is done I will get at the Glaucous and try to clear up the mess made by the creation of 30 or more names for about 10 species.

My heartiest congratulations on your desire to think of *Salix* in terms of Sections, composed of related species. The sections can be delimited, and such treatment does increase our understanding, I am sure.

My keys to the Genera, Sections, and species in Davis' Flora of Idaho was my first attempt to do that for a manual. The names of the Sections do not appear in the right-hand margin, as do the species. Instead, they are entered, (in parentheses), at the end of paragraph (last par.) keying the Section. Where there was only one species in a Section, the same paragraph keys both Section and species (see *S. amygdaloides*, p. 215). In some cases it took from 2 to 4 paragraphs to key down to a Section.

I wish you would scan the Idaho keys critically and make any suggestions that occur to you. With your keen eye for *Salix* you will be able to help me in discovering better arrangements for such keys. The Idaho and Wyoming willows have just about the same sections, I think. I think that I used the same method in the new Illustrated Flora, but do not have a copy here and cannot find the carbon of my mss. You may wish to study Fernald's try at it in the new Gray's Manual (pp. 488, et seq.).

Cordially yours,

Carleton R. Ball