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

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



THE UNIVERSITY OF WYOMING
ENGINEERING BUILDING
LARAMIE, WYOMING

December 27, 1949

Mr. C. R. Ball,
3814 Jocelyn St., N.W.,
Washington 15, D.C.

Dear Sir:

In connection with my work at the Jackson Hole Wildlife Park, Moran, Wyoming, I have some fifteen or twenty sterile specimens of the genus *Salix* to name. Since I am not a taxonomist by training, I find willows difficult to understand. I have put some tentative names on these specimens, but do not feel at all sure of them.

Would you be so kind as to look at these willows and give them their proper names? Your courtesy in this respect would be very much appreciated.

Sincerely yours,
John F. Reed,
Assoc. Prof. Botany.

(over)

Prof. John H. Reed,
Dept. of Botany, Univ. of Wyoming,
Laramie, Wyoming.

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

3 January, 1950

Dear Professor Reed:

Your letter of 27 Dec. has just arrived. I will be most happy to have an opportunity to study and determine your Jackson Hole willows, so send them at your convenience.

I have devoted special study to the vegetative organs of willows species because they are present through the season or the whole year, so positive determination, at least to species, usually can be made without flowers or fruit. I am basing all my keys to willows on vegetative characters first and floral characters secondarily. I think that that will help more students to recognize the various willows.

Please indicate clearly those which are to be kept by me, if any, and those which are to be returned to you. I am just as glad to determine material when all of it is to be returned to the sender, as I learn much from the study. But often I return the packet to the sender and he writes me that he intended me to keep some or all of them but forgot to say so. I'm just trying to save time and work, and keep things cleared up, because they are pouring in during winter.

I am just completing the keys to the Idaho willows for Prof Ray J. Davis of Idaho State College, Pocatello, and these will cover practically all of your Jackson Hole species. His book on Idaho Flora should be out this year.

I have collected at several points in Wyoming but never in Jackson Hole or the adjacent Tetons.

Cordially yours,

Carleton R. Ball



THE UNIVERSITY OF WYOMING
ENGINEERING BUILDING
LARAMIE, WYOMING

Mr. C. R. Ball
Washington, D. C.

January 9, 1950

Dear Mr. Ball:

Your letter of 3 January arrived yesterday. I can't tell you how happy I am that you will have time to look at my willows.

Your interesting comments with regard to your interest in the vegetative organs of willows, and your including vegetal characteristics as major components of keys, has prompted me to send you duplicates of all the sheets which I have collected in connection with my ecological work in the Jackson Hole Wildlife Park, as well as a few from the Medicine Bow Mts. that I have on hand. Since these are all duplicates, I would like for you to keep the entire consignment for any disposition you care to make of them. I believe there are about 17 species represented.

You will very soon recognize my inadequacies as a taxonomist in this group, because I have given a tentative name to all but ~~five~~ five of the specimens. I refrained, however, from writing the names I had decided upon on the labels which accompany each specimen. I am enclosing a list of numbers, tentative names, and general localities for any value it may have.

(over)

(See over).

If I am at all correct in my work with these, I have had some real qualms in assigning all those to Salix geyeriana Anders. I have been extremely bothered by differences between S. exigua + S. melanopais. At any rate, I await your correct identifications with most sincere interest. I assure you that you will be given credit for your most essential part in the forthcoming publication of the results of my ecological reconnaissance in the Hole.

Although Mr. Owen Nelson is no longer well or active, he still has his office in our department, and up to a few years back referred often to you in conversation.

I remain,

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John F. Reed,
Assoc. Prof. Botany.

P. S. Reference to the willows by my collection numbers will be all I need to annotate my set. The specimens are being sent to you today.
Many thanks. JFR

Professor John F. Reed,
Drpt. of Botany, Univ. of Wyoming,
Laramie, Wyoming.

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

18 January, 1950.

Dear Professor Reed:

Yesterday I wrote you briefly, air-mail, transmitting list of your collections of Willows in Albany and Teton Cos., Wyoming. Since then I have checked carefully your list of tentative determinations of this material. You have done a better job than most of the professional taxonomists. This may be due in part to the fact that you deal with them primarily from the standpoint of ecology (and perhaps use) and are accustomed to studying them in nature rather than in the herbarium. Because of your interest, and ability, and of your generous gift of so much good material, I am discussing the various Sections represented in a way that may help you to better recognition of some species and varieties.

Sect. *Lucidae*. Trees with large lanceolate, serrate leaves and glandular petioles. *S. lasiandra* Benth. and vars., which almost reach Wyo., have leaves glaucous beneath. *S. caudata* and vars. (all represented in your colls.) have leaves green beneath. *S. caudata* has twigs, buds, petioles, and sometimes midribs above more or less pubescent. Var. *Bryantiana* is glabrous throughout (sometimes slightly pubescent while unfolding); Var. *parvifolia* Ball has very small leaves (as var. *Abramsi* Ball in *S. lasiandra*).

Sect. *Longifoliae*. The Sand (gravel) bar Willows, with linear, subentire leaf (except *S. sessilifolia*). *S. exigua* and varieties occur commonly in Wyo., espec. eastward, and has yellowish to light-brown, pubescent or puberulent twigs, and more or less pubescent leaves. *S. melanopsis* has dark-brown or blackish twigs, glabrous; and leaves glabrous in the species, and mostly in var. *tenerrima*, and pubescent in var. *Bolanderiana*. No. 1812 is very juvenile and become species or var. *tenerrima*.

Sect. *Cordatae*. *S. lutea* and vars. are glabrous throughout, the leaves yellowish-green and twigs yellow, leaves glaucous beneath. *S. mackenziana* has dark-brown to black twigs; leaves glaucous beneath but dark-green above, and the base usually broader and rounded-subcordate, making it more truly lanceolate. *S. lutea* var. *platyphylla* Ball has broader, shorter leaf, and long pedicels (2-4 mm.). Your No. 2260 was not typical, as the twig was leafless except tip and leaves not fully opened. (shade effect?).

Sect. *Wolfianae*. Only *S. Wolfii* and var. *idahoensis* Ball. The species has leaf as in your collections, but not usually so pilose and becoming glabrate with age, and capsules glabrous. var. *idahoensis* has larger leaf, always silvery-pilose permanently, and pubescent capsules. By the way, when collecting in midsummer it often is possible to find old catkins stuck in the forks of a twig or among the trash at base of stem. Your No. 1591, which I named *S. commutata*, may be a sterile *S. Wolfii*. I'll check it.

S. pseudocordata and var. *aqualis* have leaves green beneath, and vegetal organs from somewhat pubescent to glabrous. The var. has smaller leaf, entire-subentire. 2 numbers of this species were identified by you as *S. pseudomonticola* Ball but that has leaves of different shape and glaucous beneath. See next Section (*Commatae*).

Sect. *Commatae*. *S. Barclayi* (Yellowstone spec.) has leaves mostly oblanceolate or broader, crenate, glaucous beneath, the base seldom broadly rounded, never cordate. *S. pseudomonticola* has broader oval-ovate leaves, glaucous, coarsely crenate, base broadly rounded to subcordate or cordate. Both these may be sparingly hairy on young twigs and petioles. *S. commutata* has leaves green beneath, entire to glandular-denticulate, and more or less ~~xxx~~ short-pubescent, shaped much like those of *S. Barclayi*. Neither Nos. 1230-7 or 1591 are typical and I will recheck them.

S. = S. Wolfii var. *idahoensis* Ball.

Section *Retusae* or *Herbaceae*. *S. cascadiensis* is easily recognized. The only other Wyoming species is *S. Dodgeana* Rydberg, of Yellowstone Park, with leaves tiny and almost orbicular.

The Sections which follow present more difficulties.

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Sect. Ovalifoliae. All species are arctic or alpine, prostrate, and some creeping. Only one (*S. anglorum* (vars.)) occurs in our Rocky Mtn. System. All species have leaves glaucous or glaucescent beneath; aments on erect leafy peduncles above the plants; and hairy capsules, with broad (mostly obovate) black scales, thinly long-villous.

Var. *antiplasta* Schn. (represented commonly by *S. petrophila* Rydb.) has oblanceolate leaves up to 4-5 cm. long, sometimes somewhat pubescent.

Var. *araioclada* Schn. has shorter elliptic-oblanceolate to oval-obovate leaves and often longer and yellower twigs.

Sect. Glaucæ. All are cold-temperate to arctic or alpine species, but erect (with one Hudson Bay exception). Almost without exception, all vegetal organs are hairy, as are capsules. The scales are narrow, and yellowish, but often become brownish in drying. *S. brachycarpa* is widely distributed in the Rockies. You recognized 1670 but not the four others. The other Rocky Mtn. species is the "*S. glaucope*" of Andersson, which probably is *S. desertorum* Richardson. I am studying that problem now. Rydberg has named different western aspects of it as *S. pseudolappomni*, *S. Wyomingensis*, *S. Seemannii*, and *S. nudescens*. Smith has collected all forms in Colo. and I have them here.

Sect. Pellitæ. Only one species with 2 vars. occurs in our Rockies. You recognized all 3 specimens of *S. subcoerulea*. I have reduced it and *S. bella* Piper to vars of *S. Drummondiana* Barr., in a paper now in press. They are characterized by leaves with dense silvery tomentum beneath, sessile aments, and sericeous capsules. Var. *subsericea* has a spicy fragrance (from glands) in press and in the herbarium.

Sect. Phyllicifoliae. Cold-temperate, arctic, and alpine. Only *S. planifolia* and vars. occurs in our Rocky Mtn. States. Twigs are glabrous, reddish-brown, shining; leaves glaucescent beneath, with veins closely spaced and very parallel, but not stout or raised much. Leaves entire or the upper (esp. in var. *Nelsonii*) remotely serrulate the younger thinly short-sericeous beneath, older glabrous. I am surprised that you did not get it in Teton Co. or Albany (that is, var. *monica* Bebb). Your 2770 had some what pruinose twigs (which *Planifolia* does not), and *Geyeriana* leaves except unusually serrulate.

Sect. Rostratæ. I am surprised that you did not find *S. Bobbiana* or its var. *perrostrata*. The species has the leaves and twigs pubescent and leaves rugose beneath and veins subimpressed above. The var. has smaller leaf, glabrate-glabrous and nearly plane on both sides. *S. Geyeriana* you recognized correctly, except 2770. (above) You may find var. *argentea* Bebb, with leaves densely silvery-pilose on both sides.

Sect. Discolores. You recognized the two specimens of *S. Scouleriana*. Both were vigorous (or worse) summer shoots, lacking the more or less densely pubescent of twigs and leaf undersurface commonly found on the species. I never saw anything like No. 2753, heavily rusted, and the rust or something else causing the parenchyma in the vein islets of the leaves to turn yellow, giving a leopard-spot appearance. I will get the rust determined also.

Again, thanks and congratulations. Will your publication treat of the uses of these willows by insects, birds, animals, and man? I appreciated the notes on height and habitat. So many omit them.

Separately I send some reprints, which you may keep or give away, as desired.

Cordially yours,

P.S. Will report presently on the few reexaminations.

Carleton R. Ball

THE UNIVERSITY OF WYOMING
ENGINEERING BUILDING
LARAMIE, WYOMING

Feb. 2, 1950.

Dr. Carlton Ball,
Washington, D.C.

My dear Dr. Ball:

The consignment of reprints and the willow specimens arrived in excellent condition on Monday. Thank you so very much for your generosity. I am preparing your willow specimens for field use by mounting them on heavy cardboard under cellophane and looking forward to a summer's work in which I can identify *Salix* species in the field - for the first time in my life, with some degree of accuracy. As you well know, Wyoming is a fine place to study willows. I dearly love their habitats - and I do feel that a paucity of real information concerning the phytosociology of *Salix*-dominated areas exists.

I have distributed your reprints to Drs. Bette and Porter. I thank you, personally, for my own & for those which will immediately become part of our departmental file.

The head of our department, H. W. G. Solheim, is a specialist in ^{the} fungi - and most interested in Rocky Mt. rusts. I have supplied him with leaves of my number 2753 - (Salix scouleriana) concerning which you made interesting comments. I hope a name for the fungus will soon be forthcoming. I will let you know as soon as I learn.

You indicated an interest in my employment. I am regularly employed (9 months/yr) as an assoc. prof. of botany at the University of Wyoming. I teach plant ecology + plant anatomy in the graduate school and at the Univ. of Wyoming Science Summer Camp in the Medicine Bow Mts. For 5 weeks each summer, I am the botanist for the Jackson Hole Wildlife Park + Jackson Hole Biological Station of the N. Y. Zoological Society at Moran, Wyoming. Vacations - non-existent - for which I am thankful. My wife + three sons are my companions in the Jackson Hole work - and I have boldly assumed a research program that will eventually culminate in a description of plants + their communities of the Hole, Wind River + Teton Mts. as well as effects of big game animals on these vegetational units. I hope to spend my life on these projects - but am not "hastening into print".



2-II-50

THE UNIVERSITY OF WYOMING
ENGINEERING BUILDING
LARAMIE, WYOMING

- 2 -

We consider ourselves most fortunate to be a part of both the University & the most active research station in the Rocky Mt. region. My wife, in spite of a sheltered southern (Kentucky) upbringing, is a rugged & primitive-loving soul. Our boys are Wyoming pioneers (in their own minds) both because of their capacity to accept a tent in the wilderness as home, and because of their insatiable interest in Wyoming trout. We live on a small ranch in the county west of Laramie. We raise goats, which incidentally love willows - indiscriminately as to species! It's great fun, Mr. Ball, and we recommend our pattern of life as a good one. By some we are considered quite unorthodox, but that is little cause for concern. Our only choice of a better place to be than where we are is Alaska - and there I'm sure I'd leave ^{to} identify a willow or two. Mildred did her Master's thesis on the genus *Cyphus* in N. Carolina. She loves the *Cyferaceae*, so I indulge her often in the family & as

result knows nothing of that group.

I appreciate your suggestions as to mode of numbering my future collections. I am humbly sorry that my double-numbering system is not good. I shall do better!

Your kindness and good fellowship, not to mention the authoritative identification of my specimens, is a bright spot in my activity and existence. I hope I may continue to bother you from time to time with an occasional identification.

Cordially yours,

Digitized by Hunt Institute for Botanical Documentation

John Reed

Sept 173 Wm's Farm

174 5my - Spelsath

5 May '50

Prof. John F. Reed,
Dept. of Botany, University of Wyoming,
Laramie, Wyoming.

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

28 October, 1950

Dear Professor Reed:

Your letter regarding your 1950 collection of willows came several days ago and the carton of willows more recently. As you are doing such a fine job of collecting, and are so interested in learning about them, I have given them immediate attention and inclose the determinations, with some comments for my own use but which may interest you also.

I am very glad that you are numbering the specimens in the order of collection. That makes the series of numbers a travelog of the season's journeyings, and brings together the plants collected at the same place or area. There were one or two deviations in this lot. No. 3104 on p. 4 belongs with Nos. 2788-2791 on p. 1. Also, No. 3096 has a later collection date than Nos. 3101 and 3102. If there are errors in either numbers or dates, this will help you find them.

Congratulations on some very valuable collections. Two of them probably extend known ranges considerably. No. 2902, *S. cascadiensis* Cockerill, from Albany Co. probably is the first collection from the eastern Rockies. Likewise, No. 3057, *S. Drummondiana* var. *bella* (Piper) Ball, almost certainly is the first collection from Wyoming. My Idaho manuscript shows it in northern Idaho, with one occurrence as far south as Valley Co., so your collection from Sublette Co., Wyo., is new for the State and a long southern extension of range. Again, congratulations. I am sure that Dr. Porter will be interested in these two collections.

No. 2993, *S. Tweedyi* (Bebb) Ball, from Teton Co., may be a southern extension but I am not certain and am not waiting to check up before mailing these lists.

If you had put your determinations on the sheets, it would have given me a better knowledge of what was hampering the recognition of certain species and I could better have suggested key characters. However, I'll be glad to help you out on any of them that bother you.

The carton was well-wrapped and tied when it came. But when I opened the package I found loose leaves and stems inside the paper and outside the carton. Also, the adhesive holding the improvised lid on the carton had torn loose from strain in the mail bags. When I opened the carton itself, there were more loose leaves and stems. The specimens did not quite fill the carton and the papers were not quite as long or wide as the carton. They all were placed in it without being tied tightly to prevent movement of the specimens in the papers. Result: the papers moved sideways and endways and the plants moved in the papers and bumped against the carton walls as the package was handled and jounced about in transit. Luckily, the damage was slight, compared to that in some packages I have received. The only safe way is to tie all specimens tightly before boxing or wrapping. If placed in a box, any loose space should be packed with crushed newspaper. Safety first!

I will check further on some distribution ranges and write you if I find any thing worth while. But you may be sure that you have contributed to our knowledge of Wyoming willows. Many thanks for the specimens. Should you find that you need some of them, please ask for them at any time.

Many of these were juvenile, which make accurate identification difficult and it is probable that more varieties could have been assured by more mature material. It is possible, also, that I have guessed wrong on some of the *monticola*-*pseudomonticola* juveniles, as my notes show.

Cordially yours,

Professor John F. Reed,
R.F.D. 1, Box 71,
Laramie, Wyoming.

Washington 15, D.C.

23 January, 1951.

Dear Professor Reed:

Your letter of 7 January came promptly and I thank you for the good wishes. My Christmas-time letter do not deserve much credit because many of them are the result of a guilty conscience because of previous neglect. But I do enjoy writing them, and all of my letters.

The little packet with 4 willows came recently (yesterday). I opened it with foreboding because it evidently had been crushed. The cardboard was not heavy ~~enough~~ enough for so thin a packet, to which the few contents gave no extra resistance to folding. The specimens were broken, No. 1 into about 10 pieces, but they will make good herbarium specimens because I will arrange the pieces as nature had them and thus show what the plant looked like. Many thanks for the specimens, as listed.

Teton Co.

Garnet Canyon, Grand Teton Peak, Teton Mts., above timberline, elev. 10,500 feet, (K) Ray Porter, Aug. 21, 1950.

KRP-1. *Salix commutata* Bebb.

(Stems stoutish, dark, 1-yr. and buds hairy; leaf narrowly to broadly elliptical-oblong, acum., to 6 cm. long, hairy on both sides and green, pist. ams to 3 cm., in yng frt, leafy pedunc.; caps. glabrous; styles sldr., 1-1.5 mm. long).

KRP-2. *S. commutata* Bebb.

(summer shoot, short, stoutish; leaf ellip., to 8.5 by 3.5 cm., green & pubesc. both sides; and serrulate; stipules lanc., to 1 cm.)

KRP-3. *S. Wolfii* Bebb, var. *idahoensis* Ball

(stems stoutish, glabrous; leaf mostly near apex, small, green & more or less pubescent both sides; pist. ams sht-pedunc, leafy; ovaries white-pubes.; styles sldr., to 0.8 mm.; stigmas minute).

Albany County.

5327. *S. caudata* (Nutt.) Heller, var. *Bryantiana* Ball & Bracelin (*S. lasiandra* ? ?) Shrubs to 10 ft. high. Stream bank of Laramie River at the diversion tunnel near Bluegrass Creek, eastern Albany Co., elev. 6500 ft., C.L. Porter, June 17, 1950. (stems normal, sldr, glabrous, shining; leaf 1/3-grown, to 5 cm., somewhat discolored, the larger apparently faintly glaucescent beneath; pist. ams in fl., pedicels to 1-2 mm.; glands sht, stout, or none)

I wish you would examine your specimens of this and see of definite glaucescence or glaucousness appears. *S. lasiandra* is not known from eastern Wyo., altho sporadic occurrence is possible. Full-grown foliage will settle the question, and this locality and perhaps this plant should be easily located next summer.

The late O. J. Murie collected a long series of specimens in the Jackson Hole area some 20 years ago. I have a list of them but no notes on the specimens. They were sent to me at the Univ. of Calif., where I then was, and are deposited in that herbarium. I have a few duplicates of them. In my work on the Wyoming willows I will go thro my herbarium and that of the U.S. National, also Nat. Arboretum and Catholic Univ. Will list the counties represented by each species and variety. In that way will get fair idea of distribution and abundance (relative), except perhaps for high elevations.

I wish I could have been with KRP on that Grand Teton climb. I suspect that some of the rearer tiny prostrate species were up there too.

Cordially yours,

P.S. Will write you another letter about that suggested bibliography. It may surprise you a bit but probably will not get mailed today.

Carleton R. Ball