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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.

December 13, 1944

Professor H. A. Davis,
Dept. Mathematics, Univ. of West Va.,
Morgantown, West Virginia.

Dear Professor Davis:

Your letter of Dec. 1 came promptly and I now will try to make reply to your various comments and queries. First, let me say that you need make no apology for not naming willows correctly. Most botanists do not undertake it at all, and those who do try it have many difficulties and errors. You did remarkably well.

I am inclosing an annotation label for the specimen of *S. lucida*. I have no other record for the state and no other south of the Penn. line except the one from Roanoke Co. Va. You speak of a duplicate in Herb. Univ. W. Va. There was none in the collection they sent me for naming but, as you collected it in 1940, I may have had their material before yours reached them.

There are other specimens of *S. cordata* with relatively short, broad leaves, from West Va. and Va. Some are so noted on inclosed list. I am glad to know about the heat treatment which so changed the appearance of the leaves. Long experience has taught me to be suspicious of such appearances.

Your collection of *S. lucida*, your and other collections of *S. discolor*, and a record of one collection of *S. hebbiana* which I identified, set me to thinking on the fact that West Va. is the mountain highway for northern species to enter the southern States. The more I thought, the more desirable it seemed that we have some check list with distribution by counties clearly given, this to be used to encourage collecting more widely in the near future.

As a result I made a list of all available specimens and records of W. Va. willows in the first half of the genus. This I have sent to Miss Bertholomew with the letter of which copy is inclosed with a copy of the list for you. You will note that I suggested your collaboration. I left out some things but will write again when I finish the distribution records and will send you copy.

The differences in your two colonies of *S. humilis* var. *rigidiuscula* may be purely inherent, or purely environmental, or both. Differences in soil, moisture, shade, and other factors produce different responses. Inheritance does a lot of the same.

Your colony of "very dwarf *S. sericea* (?)" may be *S. petiolaris* Smith. No Tucker Co. specimen of *S. sericea* collected by you was in the material sent me from the Univ. but it may have been collected, or given to them, after I det. their material. I will ask Miss. B. to send me all specimens not annotated by me.

S. amygdalina and *S. triandra* are regarded as synonyms. The plant is a rare introduction from Europe, having been used slightly in basket making.

I will be interested in your ideas about the proposed check list, showing distribution by counties and perhaps by maps. When I send the remainder of the list of specimens by counties, it will answer your questions as to what needs to be looked for, and where.

Appreciating your help, I am

Cordially yours,

Carleton R. Ball

2nd letter follows p. 5.

Professor H. A. Davis,
Dept. of Mathematics,
Univ. of West Va., Morgantown

December 14, 1944

Dear Professor Davis:

In continuation of my letter of yesterday, I inclose pages 6-9 of the county lists of West Virginia willows, including *S. sericea*, *S. discolor* and vars. *S. humilis* and var., *S. tristis*, and *S. Bebbiana*.

Inclosed also is my letter of today to Miss Bartholomew, discussing further the material and asking her to try to get the specimen of *S. Bebbiana* for rechecking. I will feel better when that has been done.

S. lucida, *S. discolor* and vars., and *S. Bebbiana* would make a good set of additions to the willow flora of any State. If we can scare up *S. petiolaris* that would be so much better.

I hope that we can do a little advertising of willows in West Va. and enlist some wide collecting by local botanists. If we ever get gas and tires again I'm coming up to do a little prowling myself.

I have the lists of Ky. Counties for these West Va. species and vars., and some records for Garrett Co., Maryland. The Va. Counties are in the bulletin on Va. willows.

Cordially yours

Carleton R. Ball
Collaborator

WILLOWS OF EASTERN WEST VIRGINIA

Collected by Mr. and Mrs. H. A. Davis, 1945).

6620. *Salix nigra* Marshall. North Fork River, below Cabins, Grant Co. June 22.
6621. *S. longipes* var. *Wardii* (Bebb) Schneider. As last.
6622. *S. cordata* Muhl. As last. (Leaved not glaucous, - dried carefully, not heated").
(Lvs. distinctly paler beneath, and will become more so. CRB.)
6623. *S. cordata* Muhl. As last, but on rock across river. (lvs. whitening. CRB.) 6/23
6624. *S. nigra* Marsh. Cabins, Grant Co., along river. June 24. (normal. CRB.)
6627. *S. sericea* Marshall. In swampy place along Devil's Run, Caman Valley, Tucker Co.
June 24. ("The small form I mentioned last year. All about this size?")
(This depauperate specimen, with very small leaves, is growing from
a larger cut, browsed, or broken stem, with moss tangled in the cut
end. The dwarfing effect could be result of swamp (undrained acid)
condition or of the obvious injury. Plants growing in meadow or
right-of-way, and mowed regularly, often look like this. CRB.)
6624. *S. longipes* var. *Wardii* (Bebb) Schn. As 6620.
6625. *S. nigra* Marshall. As 6626. (summer shoots with broad short pubescent lvs.
and very pubescent branchlets. Could result from growing in
gravel or sand, with heat reflected. CRB.)
6628. *S. alba* L. White willow, introduced. (not *S. sericea*). As 6620, but along
gravelly shore. (not that pubescence is white, not silvery, and
that the veins are closely spaced and parallel). CRB.)
6629. *S. longipes* var. *Wardii* (Bebb) Schneider. Wildcat Rock, along North Fork River,
Grant Co. June 23.
6630. *S. fragilis* L. (introduced). Davis Garden, Morgantown, from cutting obtained at
Sabraton, Monongalia Co., where they are grown in numbers and cut to 1
ground each year. Aug. 23. (lvs. on this slender summer shoot
are not yet glaucous beneath. C.R.)

11 in CRB

307 Duquesne Ave
Oct. 21, 1943

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

Dear Dr. Ball:

I am taking the liberty of sending you a small package of *Salix* specimens. These are duplicates, and need not be returned. And when you get time to look them over, I would appreciate a list of your determinations of them, by nos., especially Nos. 6622 and 6630, which I did not attempt to name. The latter is a cultivated willow, and I could get nothing but young shoots to send you this year. Maybe you can not identify it from the material at hand. No. 6627 is the dwarf *S. sericea* I told you about last year. Perhaps the dwarfing is due to poor soil and high altitude. If necessary, I shall try to get fruits next year, when I expect to get around a little more.

I have done nothing about our paper on W. Va. willows, but hope to now since work for me is letting up a little. I have been teaching full time and overtime (Army classes) since early July. I have

October 25, 1945

Prof. H. A. Davis,
307 Duquesne Avenue,
Morgantown, West Virginia

Dear Prof. Davis:

Your letter of October 21 and the accompanying packet of willows were both promptly received. As this was but a small job I have given it immediate attention, as this would not delay the larger jobs appreciably.

I congratulate you on your determinations which, with one exception, were correct as far as you made them. I enclose a list with your comments and some comments of my own.

Your only error was in mistaking *Salix alba* for *Salix sericea*. I have added some notes which will enable you to distinguish specimens like that. Probably this specimen was from a small shrub, growing from a twig which had floated down from a tree in some pasture.

The leaves of *S. cordata* vary from merely paler to sub-glaucous to almost truly glaucous, the latter condition as the plants mature toward autumn. On most species ^{with} glaucous leaves the glaucousness develops slowly. The leaves of your specimen of *S. fragilis* are not glaucous yet, probably because of rapid juvenile growth.

By the way, on your label for *S. fragilis* you state that the plants at Sabraton are grown in numbers and cut to the ground each year. Does this mean that they are cultivated for some purpose, or merely that they are growing in a meadow and get mowed off each year?

Many thanks for the specimens, which I shall be glad indeed to keep. If it will make you feel any better, I will be glad to accept junior authorship on a paper on West Virginia willows when it gets prepared. I am enclosing an extra copy of the list of determinations in case you wish to give it to Dr. Core.

Cordially yours,

Carleton R. Ball

CRB/AJM

Enc.

West Virginia University
MORGANTOWN, W. VA.
COLLEGE OF ARTS AND SCIENCES

DEPARTMENT OF MATHEMATICS

307 Duquesne Ave.

Oct. 31, 1945

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

Dear Dr. Ball:

I thank you for your determinations and comments on the willows I sent you.

The *Salix fragilis* at Sabrator are planted outside a fence by a roadside ditch, in the foreign section. There are some two dozen plants, and they are all cut to the stump each spring and all the good shoots removed. I never talked to the owner, and do not know what they are used for. Last year I picked up a broken twig which was left laying by the roadside and grew the plant from which the specimens were obtained.

I have just been mounting some 300 herbarium specimens sent me in exchange by Prof. Ownbey of Wash. State. Among them were three willows (*S. Barclayi* var. *rotundifolia*, *S. cascadiensis*, and *S. scouleriana*), each of which was annotated "Dup. det. by C. R. Ball."

Sincerely yours,

H. A. Davis
(over)

November 5, 1945

Professor H. A. Davis,
307 Duquesne Avenue,
Morgantown, West Va.
Dear Professor Davis:

Your letter of Oct. 31 just here. From your description of the handling of the *S. fragilis* at Sabraton, I venture a dark brown guess that the seasonal shoots are used either for rods in the making of baskets or other wickerware, or for more prosaic bean poles. Our foreign-born Americans are much more skilled in such crafts than are the rest of us. They had (and many still have) to be, from the pressure of economics.

Glad you are getting some of the Northwestern willows. *S. cascadiensis* is representative of the creeping alpine and arctic species. I only hope that the determinations are correct.

Cordially yours,

Carleton R. Ball
Collaborator

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West Virginia University
MORGANTOWN, W. VA.
COLLEGE OF ARTS AND SCIENCES

DEPARTMENT OF MATHEMATICS

Dec. 4, 1945

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

Dear Dr. Ball:

My work let up a little Dec. 1, so I immediately got busy with the willows. I have been teaching overtime (almost double at times) since early July, and am pretty well tired out. Now the A.S.T. (army) classes have ended, and we are back to normal teaching loads.

The enclosed notes are for you to criticize, and I hope you do so freely. I expect to rewrite it all, and have plenty of time to do so now. I suppose we may use the keys from the Willows of Virginia with some species omitted and others added. If you will supply the needed alterations, I shall gladly type the keys.

Mertz & Guttenberg reported *S. discolor* from Bogg's Island, Ohio Co., according to Millspaugh. Their specimens are supposed to be in the Carnegie Museum Herbarium at Pittsburgh. Do you know whether their record is correct? Core, in his Catalogue of the Vascular Plants of West Virginia, does not accept it. I suppose if it did grow there, it was probably washed down the Alleghany River in flood and lodged on the island.

All specimens on which county records are based have been checked by you. All county records not followed by a (B), (D), etc. are based on specimens in the W.V.U. Herbarium. I want to look over the W. V. U. specimens for new county records after we get the text finished, and also check the several question marks in the records. Do you know where Allards collections are? Only a few seem to be in our herbarium here.

Where shall we offer the report for publication? In Earl Core's Castanea?

Sincerely yours,
H. C. Davis.

Dr. H. A. Davis, Dept. ^{Mathematics},
College of Arts and Sciences,
West Virginia University,
Morgantown, W. Va.

April 17, 1945

Dear Dr. Davis:

Your letter and manuscript of Dec. 4, 1945, came just as I was winding up some war service and also a year of reviving a badly mismanaged professional organization. Some papers arriving in that period have just come to light in desk cleaning. Sorry for the long and unintentional delay.

I inclose the manuscript. On the first page I have suggested some addition by way of making the history clear to students. I have inserted a page 1a with a brief statement of the ecologic position of the State, with illustrations.

I have checked your county records against my lists, made up when I first wrote to you and Miss Bartholomew about this project. A pencil stroke under a county name shows agreement. Below are some suggestion from my records.

S. fragilis. You omit Grant Co., but my record reads: "Sparingly escaped and established along North Fork River, Cabins. Prof. and Mrs. Davis."

S. longipes var. *Wardii*. You question Raleigh Co., perhaps because you did not know the location of Tosh's specimens from McCreary and Hinton. They are in the U.S. Natl. Herb.

S. nigra. You query Tyler Co. but my record reads that the Sistersville is in the Univ. W. Va. herbarium.

S. cordata. You do not include Marshall Co., but my record reads: Big Wheeling Creek below Majorsville, and Fish Creek at Lower Bowman Run, both Bartholomew in 1940, and both originally ~~later~~ labelled *S. alba* L.

S. sericea. You have "(B)" after Tucker Co., but my record shows your 8627 from Canaan Valley in 1945. If I have the only specimen, I gladly will return it, as it should be in the State. Green brier Co. is queried but the several specimens I collected by Wilbert M. Frye reached me thro Miss Bartholomew. Hardy Co. also is queried, but Allard's specimens are in the U.S. Natl. Herb, tho not all mounted.

S. discolor. You suggest recheck of the specimens from Calhoun and Hampshire Cos. I will be glad to recheck and material which is doubtful or critical.

S. humilis. You omit Monongalia Co., from which I determined your Gum Springs plant of Sept. 29, 1937. (on Nov. 24, 1944). Apparently I later determined this as var. *rigidiuscula*, and I have entered it there.

S. tristis. You omit Webster Co. but your 3745 "in open glade, Cowan, 6/6/40 was so determined. on Nov. 24, 1944. For Hampshire Co. my list showed Wilbert M. Frye, Hanging Rock, detd. in 1940 for Miss Bartholomew, but the entry is crossed out and I do not know why. You question the Booth Creek collection by Sharp also.

Probably all the material of *S. discolor*, *S. humilis*, and *S. tristis* and their varieties should be reexamined. Juvenile specimens are bad medicine. Also the two *S. amygdalina* specimens.

The Willows of Va. would usually be cited as 37(9). 1944.

If the synonymists are to be followed some of these names which have been in universal use for 50 to 140 years must be dropped because of a few months priority by a man dead for more than a hundred years. That is "stability".

I will dig in to the keys.

Cordially yours

Carleton R. Ball
Collaborator

Professor H. A. Davis,
Dept. of Mathematics, Coll. Arts & Sci.,
University of West Virginia, Morgantown.

April 19, 1946

Dear Dr. Davis:

In accord with my promise, I inclose two keys to W. Va. willows, one based primarily on floral characters and the other on vegetal characters. It seems to me that without both, the student gets stuck from time to time because of fragmentary specimens (not showing all stages of development).

In the Keys I have changed the order, and the Numbers of two species, namely, *S. babylonica* and *S. purpurea*, from that you had in the mss. sent me. This is more nearly their natural order and the order in which they key out by floral characters. I would suggest that you use this order in the write-up. I suppose the reason that I, and others, keep *S. babylonica* with *S. fragilis* and *S. alba* is because it was introduced with them. *S. purpurea* usually goes at the end because of the one stamen, but that is a freak caused by uniting of 2 stamens. Partial union is common, and complete union in the Section *Sitchensae*.

I suggest that *S. amygdalina* be omitted from the species numbered and credited to the State. Preferably place in with any discussion of excluded species and tell what you know about it there. I would like to reach the material, in any case. If there was but one plant, and it with foliage only, and now destroyed, it would seem to burden rather than help the student to put it in the list. I inclose a brief description and notes, to which you could add your comments, if you place it in the "appendix". It has not been found accepted in Md., Va., or D.C., where basket willows were grown extensively.

If you follow the rules of priority, I suppose the findings now being published in *Rhodora* by Fernald will require the following changes in names:

1. *S. longipes* Shuttleworth becomes *S. caroliniana* Michx.
2. *S. cordata* Muhl. becomes *S. rigida* Muhl.
3. *S. discolor* var. *ericeophala* becomes *S. discolor* var. *latifolia* Andersson.

I am reducing *S. longipes* var. *Wardii* (Ebb) Schneider (*S. Wardii* Ebb) to the species. Schneider could find only difference in acuteness of stipules to separate them, and I can find all that on a single shoot. I don't see how a single shoot can be both a species and its variety, do you?

I hope that this material will enable you to go ahead speedily with your paper and I greatly regret that I should have held it up so long.

Cordially yours

Carlston H. Ball
Collaborator

June 20, 1946

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

Dear Dr. Ball:

I am surprised and ashamed when I note that your last letter was dated April 19.

Enclosed is a copy of the W. Va. Willows ms. I revised it according to your welcome suggestions. I am sending you the carbon copy so you won't have to return it. Any corrections or changes you may wish to make can be indicated in a letter and I can alter the ribbon copy accordingly. Please do not hesitate to make further suggestions. *Shall I turn the paper into Core for Castanea, or have you other plans for it?*
As to your county record comments:

The S. fragilis record from Grant Co. (Mr. & Mrs. Davis) was an error. That is the specimen you identified as S. amygdalina.

The S. caroliniana (Raleigh), S. nigra (Tyler), S. rigida (Marshall), S. sericea (Greenbrier, Hardy) records have been added, or the queries removed. (The W.V.U. Herbarium now has a specimen of S. sericea from Tucker, so you need not send us yours. Thanks.)

I appreciate your offer to recheck some critical species, and have asked Miss Bartholomew to send them to you. I hope you do not spend too much time on the S. humilis material. Many of those sheets are in no condition to distinguish between sp. and var. I am particularly interested in Sharp's S. tristis from Monongalia Co. It has short aments, but the twig is much coarser than S. tristis grows in our garden. Also, the Frye S. discolor from Okonoko, Hampshire Co. The Harris specimen of that species from Calhoun Co. does not seem to be in the Herbarium here, I believe it is at Huntington (Marshall College). Does your record indicate any doubt about it? I just can't imagine S. discolor growing in Calhoun Co. It is not in the mountains, and has no area that I know of in which northern plants are found, such as Canaan Valley or Okonoko.

Strausbaugh, Core and I discussed your recent article in Science, and fully agree with you. I hate to give up old friends such as S. cordata. One of the hardest for me to swallow is Chenopodium Berlandieri Moq. ssp. Zachackei (Murr) Zobel in place of the long familiar C. album L.

Cordially yours,
H. A. Davis.

Dr. H. A. Davis, Dept. Mathematics,
West Va. Univ., Morgantown, W. Va.

3814 Jesselyn St., N.W.
Washington 15, D.C.
July 2, 1946

My dear Dr. Davis:

Your letter of June 20, the carbon of mss. and the packet of willows awaited me on my return from my 50th anniversary of graduation and our Congregational General Council, both in Iowa.

I have gone over all the material, and realize again that plants vary greatly and that most herbarium specimens are but fragments of the whole plant expression. Hence, gray hairs and cuss words. Below are my comments.

1. The word "bridge" occurs twice in line 4, par. 2, on p. 1.

2. Remove capital S on south in line 2 on p. 2 (under S. lucida).

3. Under S. caroliniana you say "and southward". This plant extends from the West Indies north and west, occurring from Florida to Va., northwestward to W. Cent. Pa. so. Ind., and west to Mo. Okla., and Texas. The souther form has been called S. longipes and the norther S. longipes var. Wardii but there is no real separation of a variety.

4. Under S. rigida Muhl. To the range given, I would add "but not yet found in the western counties".

5. Under S. discolor, I would delete the guarded extension of range to N.C. Frye's spec. from Okeche, Hampshire Co. you will now find in S. humilis var., by the slender puberulent twigs and the narrow subescent leaves. Davis 5058, from Tucker Co. is the var. latifolia And., by puberulent twigs.

6. S. humilis and var. rigidiuscula. See my note on variation geographically in Va. Willows. Probably practically all the material from W. Va. is referable to the var. if it is recognized. I have transferred all but two of the foliage sheets to the var. These two, one from Ohio Co. (Bell in 1941) and one from Preston Co. (Davis 2762) I have left in the sp. because of broader and more oblanceolate and blunter leaves. The flowering and fruiting sheets I had to leave in the sp. for lack of foliage but doubtless most of them belong to the var.

I think that I would revise the discussion as above, citing the two probable specimens of the sp. Then state the ament spec. from such and such Cos. probably represent the var. but cannot be known certainly. Then cite the Cos. for which foliage spec. have been named as the variety.

7. S. tristis. I agree that Sharp's spec. from Monongalia Co. has stouter twigs than tristis usually has. Obviously, they were torn from a stem which would be large for tristis. Possibly they come from a mowed, burned, or grazed plant, which often will put out a few stout shoots from the remaining base. That is all guess. However, if you will look at the specimens left in S. humilis and var. you will see some with much slender stems than Sharp's. Especially note Bartholomew T-52 from Tyler Co. in 1942. In all such cases it is a toss-up.

I am puzzled also by your sheets of Davis 3745 and 3746. See my annotations. No. 3746 seem to be a dupl. of the left-hand spec. on 3745, which may indicate that there are two different plants on 3745. I am sure the slender left right-hand is S. tristis but the other, on both sheets, may be a depauperate S. humilis var. It is not very important, and impossible to be sure.

8. I will study further into S. amygdalina. Also look up data on Harris spec. of S. discolor from Calhoun Co.

9. Thanks for the note in re Science article. I found quite a fan mail on my return. The opposition should be arriving soon.

Am mailing this now to let you know things are moving.

Cordially yours,

Carleton R. Ball

July 12, 1946.

Dear Dr. Ball;

I also have just returned from a short trip, hence the delay in answering your two recent letters.

Your notes have been read carefully, and I shall make the suggested changes in the ms. I have not yet been down to the herbarium to study the specimens you returned. That I shall do soon.

I am sorry that I am not sufficiently acquainted in western Md. to answer your question concerning vacation places. No doubt such a place could be found at Mountain Lake. I have been told that Highland Cottage, Terra Alta, W. Va., is a nice place. It is ~~on~~ a hill above town. Mr. Loren Hott, Cabins, W. Va., the store-keeper, postmaster, and only resident of the "town", has a number of cabins along the North Fork River where we often stay. We like to stay there. The cabins are provided with electricity. Good water from

a concreted and locked spring on the mountain across the river is piped to a central spot among the cabins, but not into the individual cabins. I doubt if the place would be suitable for Mrs. Ball. The cabins are close together and the occupants are mostly fishermen and their families. Mr. Hott is very careful about the type of campers he has, but there is still some noise caused by radios, conversation, and such. If you do get a place within a hundred miles or so of Morgantown, maybe we could drive by someday and meet you and Mrs. Ball. We should be glad to have you call on us, at 307 Duquense Ave.

On my recent trip, with a couple of botanists and a nature photographer, we climbed Panther Knob, in Pendleton Co. Growing there, in white sand at 4490 ft. altitude among Paronychia argyrocoma was Hudsonia tomentosa! Rydberg reported it there ~~in~~ 20 yrs. ago, but his report was doubted because it seemed impossible. No one - at least, no botanist - has been there since until we emerged from the surrounding "jungle" and climbed to the rocky summit July 9. We also found there Saxifraga leucantha-nipalis, new to W. Va.

Sincerely, H. G. Davis (See over)

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

July 20, 1946

Dr. H. A. Davis,
Dept. of Mathematics,
West Va. University,
Morgantown, West Va.

Dear Dr. Davis:

Your kind letter of July 12 came promptly. Recently I discovered that the Railway Express pick-up had not called for the packet of W. Va. willows, as he had the wrong room number at the Department. However, they finally were sorted off on Tuesday last. They were addressed to the Dept. of Botany, and I hope that the have arrived safely. If you went to look at them before they arrived, I'm sorry.

Many thanks for the suggestions of camps at which to stay while collecting. I have not yet heard from all to whom I wrote and we have not made our plans. Will let you know what comes out of it and hope that we may get together.

While I remember, I wish to place an order for 100 copies of the paper on West Va. willows, as I have a considerable mailing list of those who collect locally and otherwise, and help out with useful observations.

Congratulations on the results from Panther Knob in Pendleton Co. So many of Rydberg's claims have been disproved that it is good to have this one substantiated. A centrally located mountain State always will present surprises for those who can walk, fly, or climb to the less accessible points. Keep it up.

Have just had a long letter from Strausbaugh concerning the taxonomy ~~and~~ letter in Science. Also I have discovered a more idiotic rule regarding varietal names. Always, when they run out of opportunities for name-changing they change a rule and start all over again. I still believe that plants (and names) were made for man, and not man for plants (and names).

So many encouraging letters have been received that I believe I will attempt a real paper on the principles involved, after my two current papers on studying plants have been published.

Cordially yours,

Carleton R. Ball

From H. A. Davis

West Virginia University
MORGANTOWN, W. VA.
COLLEGE OF ARTS AND SCIENCES

DEPARTMENT OF MATHEMATICS

Dec. 3, 1946

Dr. Carleton R. Ball
U. S. Department of Agr.
Washington, D.C.

Dear Dr. Ball:

I thank you for the reprint of your recent paper. I have read it carefully, with much interest. It seems that taxonomy in America has advanced to such a state that "twig collecting", at least in critical groups, is of little further value. One can tell a willow from a blackberry by the smallest of fragments. But abundant well selected material is necessary to distinguish between, let us say, Rubus congruus and R. pulchriflorus. The same is true with certain species of Salix, Crataegus!, etc. You say you often take "from three to six or seven sheets from a single plant". I wish you would further emphasize that procedure to future collectors. L. H. Bailey says of Rubus: "It is not sufficient to collect only the weak or undeveloped growth about the approachable border of patches or colonies. These outside growths may look very different from the strong plants in the middle of the patch, and these big well developed growths should be collected. One could easily find 'hybrids' and 'formae' by choosing the easily collected growths in negotiable places, in many of the big colonies, and never understand the species at all. Only good honest full-size specimens are worth preserving. As many pieces should be taken in each collection as are necessary to represent the plant, always a full sheet specimen of the primocane and at least one other of the florocane of the same plant."

These sections should be taken from that part of the canes (some two-thirds of the way from the base) where the flower and/or leaf development is at its best. Only with such material can one hope to successfully study Rubus, or other difficult groups.

During the past two seasons Mrs. Davis and I have made several hundred such collections of Rubus in West Virginia, from May to September. Seasonal developments, similar to those you so well describe in Salix, are interesting, and often misleading. For example, in June 1946, we collected in Nicholas, Webster, and Preston Counties a striking briar for which Bailey has proposed the apt name, R. illaccessitus. The Nicholas colonies, growing in rich, partially shaded bottom land, differed markedly in leafage and armature from the Preston Co. colony, on an exposed bank. The Webster Co. colony, growing in hard clay from which the topsoil had been washed by floods, showed an even greater difference. The

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leaflets were all of the early season type you describe, and the armature heavier but more sparse. It was only after careful study at home that we decided all three were of the same species, with which decision Bailey agreed. Then on Aug. 30 we discovered a "new" Rubus on top of Canaan Mountain in Tucker Co. Study at home showed it to be closely related to R. illacessitus, but only a revisit to the Preston and Nicholas colonies in September convinced us that all were of the same species. The late August - September collections from Tucker, Preston, and Nicholas Counties are ~~all~~ as nearly identical as one could expect, or wish; but they appear to differ specifically from the June collections.

In July, when in the green fruit stage, we found two remarkably "different" brambles of the Cuneifolii group in Monongalia Co. Carefully selected abundant material, collected at three different dates, was sent to Bailey. He proposed the names R. ramosior and R. perimpticatus, but added "I shall not describe ... until I have more material". I am glad he is so cautious. Next June, if nothing unforeseen interferes, he shall get plenty of each in flower. That is what is lacking in this case.

Let us hope the time is passed when "new" species or varieties are based on fragmentary collections of abnormal material. Most places, in the U.S. at least, are now so easily accessible that it is not too much to expect a collector to obtain adequate material of a suspected novelty at different stages in its seasonal development.

Sincerely yours,

H. A. Davis.

H. A. Davis

(over)

Dr. H. A. Davis,
Dept. of Mathematics,
University of West Va.,
Morgantown, West Virginia.

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

December 8, 1946.

Dear Dr. Davis:

Many thanks for your full letter of Dec. 3. No better illustration could be desired in order to emphasize the points I was trying to make.

I have a feeling, based on Dr. Bailey's long-time publications on *Rubus*, that he has not always been so cautious as now. Anyway, I'm glad he is.

What I'm really writing to say is that the greatest service you can render taxonomy today is to amplify your letter into a paper for *Castanea*, or elsewhere, so that the many young botanists may get the idea from actual illustration, and mend their ways in early life, if they need mending. If each major journal could have one good paper illustrating conditions in one genus, it would start reëd thinking in the U.S., and perhaps elsewhere. Go to it!

Have just read proof on my second paper (*Rhodora*) criticizing Fernald for describing and naming two new 1-species sections in *Salix*. I tried to show, by the results of extensive study of related material, just how weak the conclusions really were.

Cordially yours,

P.S. Don't fail to write that paper.

Carlton R. Ball

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July 19, 1947

Dr. Carleton R. Ball
Department of Agriculture
Extension Service
Washington 15, D. C.

Dear Dr. Ball:

I have asked the editor of Castanea (Dr. Core) to make all the changes in the Wulows or West Virginia which you suggested. Your suggestions are greatly appreciated. I also wrote Dr. Core concerning your desired reprints.

Mrs. Davis and I made several hundred Rubus collections during June and early July. Since July 17, I have been teaching summer school.

Sincerely,

H. A. Davis

H. A. Davis

HAD:jd

(over)

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

Dr. H. A. Davis,
Dept. of Mathematics,
Univ. of West Va., Morgantown.

July 28, 1947

Dear Dr. Davis :

Your letter of July 19 came promptly and I am glad if any of my suggestions was of help to the paper. Curiously enough, just before your letter came, I happened to be consulting the letter file of Smith Davis, and found my 1946 correspondence with you about this mss. therein, with a copy of the mss. itself.

I was just about to say that not all of my filing is like that when I went to look up your card in my reprint-distribution file and couldn't find any card for you. Surely I must have sent you some of my reprints before. Anyway, I am sending three recent ones separately. If I did not send you the "Willows of Virginia, I still can supply a copy of that.

Glad you are giving Dr. Bailey fun with Rubus. He does not seem to run out of new specific names. Perhaps he will equal the record for Grataegus. I think that was 1289 species.

I am writing willows for Illus. Fl. and striving to give distribution records that are accurate. In most manuals, they are "summarily awful". I wish I knew all the ecologic reasons for peculiar extensions of range. Two Great-lake-shore species (sandy habitat) appear in a marsh in e. central Ind.

With all good wishes, I am

Cordially yours,

Dear Dr. Davis:

Carleton R. Ball

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H. J. G. Hall
Dr. H. A. Davis,
Dept. of Mathematics,
Univ. of West Virginia,
Morgantown, West Va.

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

November 17, 1947

Dear Dr. Davis:

I have just received my copy of Sept. Castanea and not with much interest the appearance of our paper on West Virginia willows.

I cannot now remember what I have said previously about reprints when the paper was printed, and I not at the moment where my letters are filed.

If I previously had asked for 50 or 100 reprints, that is all right. If no request for reprints had been made, I would very much like to obtain 50, if the type or plates have not been destroyed. I would not care for covers on them.

Congratulations on the birth of this baby, which represents a lot of good hard work on your part. That is the only way that creditable write-ups of local floras ever are produced.

Cordially yours,

Carleton R. Ball

CRB

West Virginia University

MORGANTOWN, W. VA.

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December 2, 1947

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

Dear Dr. Ball:

I reminded Dr. Core to send you reprints of the West Virginia Willow paper. I have not seen him lately, but no doubt he has sent them. If not, write to him, or to me, about them.

The affairs of the Mathematics Department take up most of my time now, but Mrs. Davis and I are still trying, with the help of Dr. Bailey, to untangle some of the briars in West Virginia.

Sincerely,

H. A. Davis

H. A. Davis

HAD:jd

(over)

Dr. H. A. Davis,
Dept. of Mathematics.
University of West Va.,
Morgantown, West Virginia.

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

December 6, 1947

Dear Dr. Davis:

Many thanks for your letter of Dec. 2. I have just received, and paid, a bill from the Morgantown Printing and Binding Co. for 50 reprints. I have not received them but as they have been printed, I assume that they are coming soon.

Am glad that you and the briars are still tangling. When your aid helps Dr. Bailey to untangle all of them, why not collect several more from the plant at all stages of development and tangle him all up again?

I am amazed at the disregard, by taxonomists, of the normal variations in a single individual plant through the progressing seasons and at different ages by years. Just now, one extatic individual, Leon Kalso, is pouring out a deluge of new vars., forms, and combinations in *Salix*. So far as can be told from his publications, several are based on juvenile or only partly matured expressions of well-known species. Others seem based on a complete lack of knowledge of the species to which new varieties are being added. Taxonomists seem to be the only group of scientists who have no standards and permit no checks or supervision. Such is life.

If I don't send you a copy of *Willows of West Va.* you will understand why, but I do wish to express my warm appreciation for your generous sharing of authorship. I repeat that it is only the splendid work of the localized students and collectors that permits the so-called "expert" or specialist really to be able to know the plants in a fairly complete way.

With all good wishes for the Christmastide and the New Year, I am

Cordially yours,

Carleton R. Ball

Professor Ray J. Davis,
Dept. of Botany,
Idaho State College,
Pocatello, Idaho.

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

21, January, 1949.

Dear Professor Davis:

I inclose a list of determinations just made for Prof. J. H. Christ, of the Soil Conservation Service, now stationed at Portland. These all are from Idaho in 1948. I have not checked as to how counties for any of them yet.

I have just reread your letters of October 19 and 29, 1948, which apparently have not been answered. The manuscript is yours and for the use of your constituents, and therefore you should arrange it as you wish it, as to order of arrangement, spacing, numbers, etc.

I have a feeling, based on long experience, that an alphabetical arrangement of species in a genus as large as *Salix*, is not the most helpful, even for amateurs. In California, I made keys with the species arranged by Sections, for a group of school teachers who are nature lovers and amateur botanists. They went out for a two-weeks foray and were able to name every willow they found, some even to varieties. Where they are arranged by Sections (related species) the worker soon comes to know these relationships, and can work without the keys. However, as I said, this is your publication, and you will arrange the material as you wish it. It will not worry me. You recall the newsboy, asked if the heavy papers didn't make him tired, replied "Now, I don't have to read 'em".

I don't now recall just how I have given distribution of species, but probably not uniformly. I would be interested to know just how you distinguish between "eastern" and "southern" Idaho. The southern part goes just as far east as any. I have pictured it as "eastern", "southwestern", central, and northern. Perhaps "southeastern" would be better than "central", etc.

During latter December I was off on other duties and in first half of January, Mrs. Bell and I have had a two-weeks siege of colds, very prevalent here. Everything has gotten behind but I expect to get back to manuscript very soon now.

With all good wishes for the new year, I am

Cordially yours

Carleton R. Ball

P.S. I have all the Idaho specimens with Counties added to the labels, so far as I can do so, in my own herbarium and the U.S. National Herbarium. The Forest Service is working out the counties for all their Idaho willows.

If you will give me the list of counties you place in southern Idaho and in eastern Idaho, I can make my distribution reference agree with that, which you use.