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5th Floor, Hunt Library  
Carnegie Mellon University  
4909 Frew Street  
Pittsburgh, PA 15213-3890  
Telephone: 412-268-2434  
Email: [huntinst@andrew.cmu.edu](mailto:huntinst@andrew.cmu.edu)  
Web site: [www.huntbotanical.org](http://www.huntbotanical.org)

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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.

Alberta Can

Address: Extension Service, U.S. Dept. Agric.

August 12, 1939

Dr. George H. Turner, M.D.,  
Fort Saskatchewan, Alta., Can.

Dear Dr. Turner:

Your letter of July 17 came just as I was starting on a western trip and the packet of willows was awaiting me on my return. These are splendid collections and I congratulate and thank you very much.

Your determinations are remarkably correct. I am not typing the full list but only the corrections, as you requested.

*S. lasiandra* Benth. No. 1193 staminate is glabrous and is the species. No. 1193 pistillate and Nos. 1270 and 1318, both pistillate, have pubescent branchlets, stipules, petioles and blades and is *S. lasiandra lancifolia* (And.) Bebb, distinguished by hairiness but not by leaf shape. The var. occurs sparingly to Yukon and Alaska.

*S. interior pedicellata* (And.) Ball is the plant you named *S. linearifolia* Rydberg, a species not now recognized. (Your Nos. 1195, 1271, 12221, 1251.)

*S. pedicellaris hypoglauca* Fernald (not (Anderss.) Ball)

*S. athabascensis* Raup, No. 1289, has some styles longer than usual.

*S. planifolia* Nelsoni Ball. Your specimens seem mixed. Nos. 1180 and 1189 are flowers and leaves not developed. No. 1236 has half-grown leaves and two shoots have narrow, pointed leaves (var. Nelsoni) and one shoot has broad blunter leaves (*S. planifolia*). No. 1260, will leaves full grown has two shoots with narrow pointed leaves (var. Nelsoni) and two with broadly elliptical leaves (*S. planifolia*).

*S. Bebbiana perrostrata* (Rydberg) Schneider (not just Schneider alone) has leaves glabrate to glabrous when full grown. Your material seems to be the variety, except No. 1284, which has 4 twigs of which two have glabrous leaves (var. *perrostrata*) and two have white-pubescent leaves (*S. Bebbiana*).

From these discrepancies I assume that not all of your collections on one date were taken from a single plant and there fore there was a chance for mixtures to occur.

If you have any questions or comments, I will be glad indeed to have them at any time after October first. Greatly appreciating your generous gift of this material, I am

Most cordially

Carlston R. Ball

Executive Secretary

September 21, 1940

Dr. George H. Turner,  
Fort Saskatchewan,  
Alberta, Canada.

Dear Dr. Turner:

Your letter of August 31 and accompanying package of willows were promptly received but I have not been able to give them as prompt determination as I usually can. I take pleasure now in sending you the list of determinations.

You will note that some of them are guesses as to the parents of what appear to be hybrids. Because of the numerous characters which can be affected by hybridization, it is difficult to determine both parents in many cases. I am not sure that your No. 1690 which I have determined as *S. pseudomonticola* and probably a hybrid with *pyrifolia* really is a hybrid at all, although the strongly infertile fruits would indicate hybridization.

*S. pseudomonticola* is a variable species, but I doubt if it is any more variable than most willows. Willow leaves change in shape as they unfold and develop. The broader the final form of the leaf the greater the change during this process of development and, therefore, the greater number of appearances the species may present if collected on different dates through the season. *S. pseudomonticola* has relatively broad leaves with cordate bases when fully developed. It, therefore, must go through a considerable range of shapes in developing from the bud to the mature plant.

A very interesting way to study variation in a species is to collect all the expressions from a single plant and on different dates throughout the season. In one sense this is like following a human being through from childhood to maturity and noting the different appearances. On any vigorous willow plant, especially of the shrubby and arboreal species, there are likely to be four or five quite different foliage expressions. There will be the small leaves on heavily fruiting branchlets; there will be relatively small seasonal shoots; there will be vigorous, large-leaved seasonal shoots; there will be

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succulent sprouts toward the bases of the larger branches; and there may be extremely vigorous sprouts from the trunk. There is an enormous range of difference in size and shape in these five expressions. When you consider that each of the five may be collected in different stages of its development, from leaves just unfolding to the complete development of late summer, and when we consider further that there is a considerable difference in coloration between those exposed to the full sun and those growing in heavy shade, we can appreciate the extreme diversity which a single plant may show in the course of a single season. After one has made such a study he ceases to wonder at the diversity between individual plants of the same species.

Hybridization, of course, greatly increases the diversity of forms. In my rather wide experience, however, both in the United States and Canada, I believe that the total number of hybrids is relatively small in proportion to the total number of willow plants. Because of their very different appearance they attract attention and get collected in greater numbers than their actual proportion in the willow population. For instance, you have recorded that your Nos. 1652-2012 is the only plant of its kind. This frequently is the case because hybrids generally are more or less sterile and there is relatively little reproduction.

In your letter you say that your Nos. 1746-1858 and 2162 are all from the same shrub. Your labels for Nos. 1746 and 2162 state that they are from the same shrub as No. 1710 and from the same locality. The label for No. 1858 does not say that it is from the same plant as any other number, although it is from the same locality. From the appearance of its foliage it could have been from the same plant as the other three.

When I received material of *S. athabascensis* Ramp from him, I was puzzled by the resemblance of some of the specimens to that peculiar plant which resembles *S. glauca* but the correct identify of which is not yet known. It is the plant called *S. glaucops* by Andersson. The earliest species named in this complex was *S. desertorum* Richardson. Many other species have been named since that time. Later I hope to work up this complex and determine what names should be applied.

Now as to the line of separation between this group and *S. athabascensis*, I can make no statement without further study of typical material. The two sections of the genus to which the two species belong are very different but *S. athabascensis* is an aberrant member of its section if it belongs there at all.

Greatly appreciating your courtesy in sending this material, I am

Cordially yours,

Carleton R. Ball,  
Executive Secretary

G. H. TURNER M.D.

FORT SASKATCHEWAN  
ALBERTA

Dec. 23, 1942

Dear Doctor Ball

I know it is not customary to acknowledge the receipt of Christmas Cards, but neither is it usual for ordinary mortals to receive such a message as yours brought me yesterday. Its little verses were surely written by one of the Greathearts of the World, and as surely sent to me by a member of the same Great Fraternity. So I must express to you the great pleasure that it brought me.

International boundaries cannot separate the spirits of men when they reach out across the spaces of earth to touch one another with their warmth, especially at this season when all men of goodwill are under the spell (more or less) of the Greatest Heart of all and the Greatest Spirit of all.

Please accept this word of appreciation and greeting to yourself and your Good Lady with my warmest wishes for your happiness.

Yours sincerely,

George H. Turner

Dr. George H. Turner, M.D.,  
Fort Saskatchewan, Alta., Canada.

September 20, 1944

Dear Dr. Turner:

Today I found a bunch of letters which came just before and during the 2 or more months I spent in hospital in the spring of 1943 (virus pneumonia with drainage and prostate double operation). Had best surgeons and was as well as ever by summer.

I greatly appreciate the kind words you said about our Christmas verses. I fear the words were better than my deeds.

Retired on June 30, 1943 (at 70) and have been working steadily ever since, partly on war work and partly on my own projects, including monograph of *Salix*. Have just finished *Willows of Virginia* with Dr. Messey. Am rushing treatment of *Willows of Alaska-Yukon*, and of our N.E. States (for *Illus. Flora*). All helps toward monograph.

Your generous contributions have helped in settling distribution and I hope to tell fairly accurately where species occur and where they don't.

With all good wishes, I am

Cordially yours,

Carleton R. Ball  
Collaborator

Fort Saskatchewan, Alberta,  
April 11, 1947

Dear Doctor Ball,

I received the 4 botanical papers that you so kindly sent me, and have already had the pleasure of reading them all through once. I expect to read them many more times, especially "More Plant Studies", "Former Plant Names" and "The Willows of Virginia". The former of these two will have great value in helping to evaluate variations that normally occur in any willow or in different plants of the same willow species, as compared with the more static differences which characterize different <sup>species</sup> and their variations. In many plants besides willows also I find it necessary to note the location of those ~~varieties~~ <sup>species</sup> in a given year, and make notes and collections at the different stages of their development. Only a life-time of familiarity with the subject could have enabled you to systematize these principles for us so excellently. I am uncommonly glad to have a copy of this paper, and thank you very, very much for it, and for the others.

"The Willows of Virginia" has great interest for me. To me there is something charming about it from beginning to end. Ten of the 16 species dealt with are familiar to me, though only 2 (interior and petiolaris) are found in Alberta,

as far as I know. The views of the present controversy about *Petiolaris* I am especially glad to have the keys and description that apply to it.

I have a good series of mounts of *S. humilis* from Saskatchewan, kindly given me by August Breitung, and an equally good series of Sask. specimens of *S. lucida* from him also, and all determined by yourself. *S. humilis*, quite likely, and *S. lucida* possibly, may eventually be found in Alberta, though not yet found here.

My *S. cordata* series are all from Sask. also. I am familiar with *babylonica*, *alba*, *fragilis* and *pentandra* as introduced into Alberta, and also with *S. daphnoides*, which has apparently been quite widely been introduced into both Alberta & Sask. I noted with surprise its absence from the number of European species introduced into Virginia, as to me it is the most beautiful of the European willows I know. Perhaps the Virginia climate is unfavorable to it. The Sapsucker Woodpecker seems to find it the most attractive willow we have here, and sometimes does it great harm. Its catkins & peltate bracts are wonderfully lovely in Sask. at present.

Speaking of *S. interior* blooming late in the season, I learn a specimen in bloom collected July 11, 1933.

Our snow is nearly all gone, and our early willows (*S. planifolia*, *S. discolor* and *S. pseudomonticola*) are showing good (precocious) catkin development.

With best regards and all good wishes and reiterated thanks for the enrichment bestowed upon me by you today, I am  
your sincerely,  
G. H. Turner (See over)

northern

P.S. It was Dr. Rosendahl, in his Rhodora paper on *Chrysoplenium*, who got my first initial C. instead of G. In the summer when I got duplicates of our local *Chrysoplenium* lowense Rydb. I plan to send him specimens, and will then draw his attention to this error - too late, of course, as far as his Rhodora paper is concerned. When Dr. Moss asked me to lend him what *Chrysoplenium* I had, to send to Dr. Rosendahl I had only the one sheet. It was later returned to me, so Dr. R. has no specimen of any of our Pal. Barb. colonies.  
sincerely, G. H. S.

P.P.S.

You would probably have received a reprint of Dr. Francis' paper on Barb. Willows, if he had lived. He was a rich man when he finished it, and died a few months later. If you cared to write Barb. University I feel sure they would be very glad to send you a copy. It has great value for me.  
G. H. S.

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

April 17, 1947.

Dr. George H. Turner,  
Ft. Saskatchewan, Alta., Canada.

Dear Dr. Turner:

Your two most helpful letters of April 11 and 12 are here and I will comment immediately before getting under the taxonomic loads again after the "aster holiday."

I appreciate what you say about "More Plant Study". Most of the comment has been favorable. Recently one collector and author of a "Flora" opines that he would not demean himself and confuse taxonomic workers by collecting such "freaks" as the expressions of all parts of a plant, or of different plants under different environments. That was a new idea to me. I had thought that each of such variations was the "normal" for the existing conditions of age, seasonal development, and environment, and that taxonomists ought to know and be able to identify them.

So far as I know, *S. lucida* has not been found in western Saskatchewan or in Alta. but the related *S. gerissima* goes as far west as Brit. Columbia. Likewise, *S. humilis* is not found west of Sask., but the closely related *S. discolor* and especially its var. *prinoides* occurs west to Montana, Alta., and B.C. (drier central portion).

Many species of willows put out a few autumnal catkins occasionally, under some impulse we do not understand. Oftentimes these are on old wood and evidently are not an early flowering of next years' normal catkins, such as occurs on the Pacific Coast, before this years' leaves have dropped.

I am delighted to know that you have the cultivated *S. daphnoides* in your araea. I have specimens from Sask. and it is used as shelter-belt material in our north-plains States. You may be interested in studying the appearance and disappearance of the glaucous or pruinose bloom on the twigs and buds. It can be wiped off and undoubtedly is washed off by rain, blown off by dust in the wind, and weathered off by exposure. With Kirk Whited, I undertook a little study of it on *S. Lemmonii* in Oregon. I have hunted up an extra copy of our paper and mailed it to you last night. Yes, *S. daphnoides* does not do well in southern climates.

I am much interested in the sap-suckers and their work on willows. I have always regretted that I did obtain a section from a willow trunk about 4 in. in diam. in which they had bored a regular series of holes for two feet or more. This was in the mountains of California. If you can obtain any thing like that for me, I will gladly pay for it, or them. This goes also for diamond-willow canes. These "diamond" pitted stems are found on *S. lutea* and its relatives in the Cordates and may occur on the related *Commatae*, such as *S. pseudomonticola*. I have two, one from Alaska and one from the Peace River.

Many thanks for the suggestion on Dr. Fraser's paper. I will write at once. I will mention his slip to Rosendahl next time I write. I noted it only because I took his paper out of the copies of *Rhodora* received and sent them to him.

It was very kind of you to send me McCalla's notes on *S. petiolaris*. I had determined all the earlier ones but he did not send the later, probably because he was sure of its identity by that time. His collections are at intervals from the same plant but he does not tell us if the twig color records hold true through the season. Pink or red anthers often are the young stage and yellow appears as the pollen grains enlarge and the pollen sac (anther) matures. I return your typed list, as I have made copies.

Carleton R. Ball

Cordially yours,

P.S. I share your opinion of McCalla.

From G. H. Turner  
Fort Saskatchewan, Alberta  
Aug. 8, 1947

Dear Dr. Ball,

Aug 8, 1947  
I much regret the long delay in acknowledging receipt of your valuable letter of July 21. I was away at Pigeon Lake when it came and have only now returned home. Within the next few days I will finish my little paper on Salix petiolaris, and will send you a copy to check over for any suggestions you think advisable. The delay in finishing it has been due partly to my desire to follow the coloring of several twigs until I found them altering the pale green they had shown from their first appearance. Their growth is now complete for 1947, and on July 24 I first noticed the pale green changing to pale yellow; now these twigs are quite commonly brown on the side exposed to the sun and yellow beneath (or on the side away from the sun).

I collected mature leaves of S. Scouleriana at Pigeon Lake while there recently, and will be sending you specimens later. In your letter you refer to a few of my <sup>Saskatoon Willow</sup> numbers with a wish for later collections. I will try to secure those and include them in the same parcel.

Aug 8/1947  
40 p2  
Least fear at Pigeon Lake, which is about  
miles S.W. of Edmonton, I found fine alpine  
plants, which seem to be remnants of an  
earlier condition there, similar to what is found  
in the Cypress Hills much further south and east.  
There were Smilacina racemosa (L.) Desf., Streptopus  
amplexifolius (L.) Desf., Delphinium scapularum Gray, var. laucum  
Gray, Sorbus scopulina Greene and Spiraea lucida  
Douglas. That was why I was so much  
interested in finding Salix Scouleriana there  
this year also, and quite plentifully. It has  
not been found elsewhere in the Edmonton District.

With best regards, I am

Yours sincerely,

George H. Turner

Fort Saskatchewan, Alberta

Aug. 9, 1947

Dear Dr. Ball,

I am sending you herewith the Manuscript of my little paper on Salix petiolaris with three illustrations. Any alterations you may wish to make in the wording will be very welcome. If you wish to do so, after checking it over, you may send it directly to Dr. Senn with a request that he publish it in the Field-Naturalist, or you may return it to me for forwarding to him.

Yours sincerely,

George H. Turner

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P. 8.

In your absence this was returned to me by the postal authorities, as they got no response to notices sent you. I am immediately re-mailing it to you.

Frank Turner  
Fort Saskatchewan, Alberta

Aug. 11, 1947

Dear Dr. Ball,

I received your returned letter today and went out this afternoon looking for the large-sized leaves of *Saxifraga petiolaris* to which you referred in it. I regret that you had not earlier requested consideration of them, and that I made no reference to them in my little paper on the species, that I forwarded to you a couple of days ago.

I found abundance of the large leaves on vigorous new shoots from old stems, especially around the Shackleton pond whose picture I enclosed with my manuscript, (around which *petiolaris* occurs in pure culture). I also found plenty of them on shoots that had grown up where the spruce had been cut down within the past few years and then left to grow up again.

Leaves up to  $5\frac{1}{4}$  inches are plentiful, and I found several that are  $5\frac{11}{16}$  inches long and as wide as  $\frac{1}{2}$  inch. I have specimens in the press and will forward them as soon as they become dry. I failed to find any that were quite 6 inches long.

I enclosed 3 photos with my Mss., but if you have already made use of them, as I trust you have done, and if it would then be better not to have them repeated in my

(See over)

paper I will leave it to you to leave  
them withheld from the printer.

I wondered if in my paper I should say  
that my material had been checked by  
you and my determinations upheld, or should  
assert <sup>only</sup> them as I have done, I hope that  
this letter may reach you before you have  
let my Mss. leave your possession, so that  
you may add the new item about size  
of leaves of vigorous new shoots if you think best.

Please do not send me any money  
as I could not help feeling very much  
hurt if you did. The balance of indebtedness  
is still greatly on my side, considering your  
kindness of <sup>by</sup> - gone days.

While I was at Pigeon Lake I was  
told of a Mr. Klappstein who does remarkable  
work in fashioning Willow stems into all kinds  
of furniture. <sup>+ 2 went to see him</sup> His house is mostly furnished with  
such pieces - even a bedstead has <sup>posts</sup> 4 legs of  
willow. He selects unusual shapes, many  
with a few "diamonds". The only piece I  
would greatly have coveted personally was  
a lampstand whose stem was made of  
a single piece of stout willow stem, over 3 inches  
in diameter which was completely set with  
large "diamonds" for about 2 feet of its length.  
Six or eight inches of round stem was above

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and the same below this ornamental part.  
The whole was polished perfectly, the unlacquered  
wood being white and the diamonds a  
rich mallogany color. I do not know  
that Mr. Klapstein ever sells any of these  
things and did not ask him, as perhaps I  
should have done. He is a permanent  
resident of Ma-Me-O Beach, an  
elderly man, retired from some business  
or profession.

I think it probable that the lamp-stand  
piece is *Salix lutea*. Most of the other  
things are probably not. Few of them show  
any regularity in the distribution of diamonds.

I fear that I cannot claim any re-  
lationship to the G. H. Turner to whom you  
refer. My people were Loyalists who  
left the eastern states at the end of the  
Revolutionary war and settled in New Brunswick.  
With best regards and all good wishes, I am  
Yours sincerely,

George H. Turner

Aug 11, 1947

p 3

Fort Saskatchewan, Alberta.

Sept. 2, 1947

Dear Dr. Ball,

Thank you very much for your letter of Aug. 27. I was disappointed to find that my petiolaris leaves were not measuring up as well as I had hoped, since petiole length is not included. I trust, however, that you will find a few of the blades close to 6 inches.

I had sent my subs. to you by registered mail, which turned out to be a mistake under the circumstances, for the postal authorities got tired of waiting for your return <sup>from today</sup>, and sent it back to me. I got it back this morning and am again sending it to you by registered mail. I wrote a hasty note in it, but have felt since mailing it that I should have written a little more fully.

A few days ago I made a trip among some of my nearer petiolaris friends and compiled a list of their colors as seen at the end of Aug. I am enclosing it, as I wanted you to see it since I am to enter an Edmonton hospital this evening for a prostate operation. In

(see over)

(over)

case I might not survive the experience  
I am leaving it for you to decide whether  
my little paper is worth publishing, and if so  
to add to it if you see fit any of the extras  
I have given you, such as size of leaves  
of young shoots, coloration of seasonal turgors  
or any other little point I may have mentioned  
but not included.

I regret that I have to write all this  
heartily, and without as careful consideration  
as a letter to you deserves.

My best regards to you and best wishes  
whatever the future holds for either of us.

Yours sincerely

George H. Turner

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

Dr. George H. Turner,  
Fort Saskatchewan:  
Alberta, Canada.

September 18, 1947, / 1

Dear Dr. Turner :

In accordance with my letter of Sept. 8, I have reviewed and completed your manuscript on *S. petiolaris* and have just sent it to Dr. Harold A. Senn, Editor of the Canadian Field-naturalist.

I inclose herewith (1), copy of letter to Senn; (2), your original mss.; (3), retyped draft of mss.; and (4) your tabulation of twig colors on Aug. 30.

The principal reason for retyping was that some journals will not accept a mss. in single-spaced typing and I did not want any farther delay with this one. While retyping, I made some changes in the text, for which you may shoot me as soon as you get around again.

In general, I shortened some long sentences, omitted the personal pronoun (I), and changed sequences in places to follow the order of development, as in giving smaller dimensions first, early leafy color before later, etc., in order to keep the sequence of development.

You will note that on p. 4 I have added your leaf-dimensions from sprout specimens, and also a footnote of my own. On p. 3 I inserted your twig-color table of Aug. 30. Here, too, I put the first color first in case of combinations.

This is a fine contribution to our knowledge of this controverted species and I want to see it set into print at the earliest date possible. Hence my suggestion that it replace a little paper of mine in order to gain priority.<sup>4</sup>

I very much hope that you will be up and around again by the time this arrives and that you are as permanently relieved by your operation as I was by mine.

Cordially yours,

Carleton R. Ball

mss inside

Royal Alexandra Hospital, Edmonton,  
Sept. 17, 1947

Dear Santa Ball,

From G.H. Turner

When Mrs. Turner made her daily visit to me here yesterday she brought me your letter with documents enclosed, including the mss. of my little paper on *S. patula*, (1) as originally sent to you, (2) as retyped and rearranged and enlarged by you; and a copy of your letter to Dr. Senn.

Two days previously she had brought me your earlier letter.

Thank you very, very much for all your help in this matter. Your words of evaluation of my paper are very kind - too generous in their kindness, I fear.

The changes and additions you have made have all improved the mss. greatly, and I feel not a little guilty in having it published as <sup>mine</sup> when so much of its value has been contributed by yourself.

It surprised me that <sup>you</sup> were able to do all that you did in this matter within the short space of two days - in the careful and thorough manner in which you did it. I am indebted to you beyond words.

(See over)

blade lengths, and single-stemmed occurrence. The wide range of ecologic, physiologic, and botanic facts in your paper will be extremely valuable as records and my brief excerpts will not infringe on your production, especially as your paper will be in print first, without question. Jour. Arnold. Arboretum has not yet decided if they will accept mine.

I see that I have forgotten to mention that your 6-inch blades set a new "high" for the species and I hope that the satisfaction of finding them contributed to your quick recovery. You will find still larger ones later in the season, and break another record.

With all good wishes, I am

Cordially yours,

Carleton R. Ball

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P.S. Dr. Senn wrote me that the photo of the three single-stemmed plants in the aspen woods was so badly bent that he had written to you for another one. It was bent in the mail on its way to me but I thought it would still make a good engraving. I packed the pictures in cardboard for shipment to him and I don't think that they got bent again. I assume you can send him a new print, but if not I can take the one from herbarium sheet and send him.

17-18-47  
for all this help, especially since  
my enforced holiday in the hospital  
has temporarily suspended all activities  
relative to my ordinary botanical  
~~activities~~ interests.

I am pleased to be able to  
tell you that I am making  
excellent progress toward recovery  
after my prostate operation. It  
was the per urethram operation,  
and entirely successful, I believe.  
I started getting up two days after  
the operation, and now I remain  
up most of the day. I expect  
to return home on Sept. 20.

Thank you for the kind re-  
ferences to my health in both  
your recent letters. I much  
appreciate them.

With all good wishes to you  
and yours, I am

Yours sincerely,

George H. Turner

3214 Jocelyn St., N.W.  
Washington 15, D.C.

Dr. George H. Turner,  
Fort Saskatchewan, Alta., Canada

September 23, 1947

Dear Dr. Turner:

I was just about to write to you and find out how you were progressing when I popped your good letter of Sept. 17, with its splendid news. If you went home on Sept. 20, as planned, you were in hospital only 2½ weeks, which is a good record, I think.

I am sure that clean living, outdoor activities, and a buoyant spirit are factors in ageing gracefully and in recovering from such experiences quickly. I also must claim something for the curative properties of the willows with whom you have been associating. Perhaps *S. petiolaris* is especially potent. Our Indian tribes knew the medicinal value of the willows, as well as their more prosaic but equally important uses for fish weirs, poles, canoe spreaders, etc.

I don't know the technical name of my prostate operation but it was not Gallic, for it was divided into only two parts, separately by an interval of one week. I told the doctor (surgeon) that that was their way of finding out cheaply whether I was strong enough to stand the whole job. Evidently they decided that I was.

Don't worry too much about what I said of you and your paper. I once lived on the frontier. When I began to supply notes on the wild life of that little known area I was surprised at the interest it aroused, and then I began to realize that only the residents of such areas can dig of the facts which make the city-dwelling specialists able to "specialize". Since then I have been profoundly grateful to the many who have toiled long and faithfully to make our willows and their private lives better known to science.

In this respect, you have done a specially good job on a critical and difficult problem. If the facts in your paper had been in print years ago, it might have deterred Dr. Fernald from his foolish assumption regarding the "British" habitat for *S. petiolaris*. I have used merely your extreme measurements of heights.

Fort Saskatchewan, Alberta  
S.H. Turner Sept. 27, 1947

Dear Doctor Ball,

Thank you for your very kind letter of the 23<sup>rd</sup> inst., which I received today.

I had received Dr. Senn's letter before leaving hospital, in which he asked for a new copy of my no. 3 willow picture. Mr. Turner at once ordered one from McButcher's of Edmonton, who had made my earlier ones for me, and we got it sent at once to Dr. Senn. I believe he already has it as I write this.

I got home on Sept. 20, the day I had mentioned to you as my likely day for leaving the hospital. My operation was the new one, in which the surgeon operated entirely through the scrotum and at one operation removed by means of an electric cautery that part of the enlarged prostate gland which is causing the obstruction. I believe I was about an hour on the operating table - at all times fully conscious, as the anesthetic was a spinal one. At the end of two days I was getting up around my room, and recovery was steady and uninterrupted. The success of the operation seems to have been perfect, as I have complete and free relief from all my old obstruction. Dr. Ellis expressed belief of the operation would be complete at the end of about three weeks. That

will be in 2 more days. As a matter of  
fact I feel as if it were complete already.  
I have been out doing a little field work  
already. I have visited the marshy colonies  
of Salix patularis but failed to find any more  
specimens with leaf blades quite up to the wind  
length. It is sensible that I will do so this  
year now, as we lately had 4 degrees of frost  
and all our plants with deciduous leaves already  
have their beautifully colored with their autumn  
tints. The first gale of wind will send most  
of them falling to the ground. At present our  
landscape is gloriously beautiful with all the  
rust of leaf coloring.

With many thanks for all your kind and  
too-generous words, and all good wishes to  
you and yours, I am

Yours sincerely,  
James Smiley

George H. Turner

Sept. 27, 1947

(See over)

Dr. George H. Turner,  
Fort Saskatchewan, Alta. Canada.

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

October 8, 1947

Dear Dr. Turner:

Your fine letter of Sept. 27 came promptly and I am delighted to know that you have such speedy and complete recovery from the prostate operation. That shows the results of good surgery and good living.

I was much interested to learn the exact manner of conducting the operation in your case. That probably causes as little mutilation and irritation as could be and so helped to speed recovery. Mine was the old-fashioned "double" operation and completely successful. I was longer in getting out after it, but I had just had an operation on my back for drainage of one lung, so naturally was not any too peppy at the time the prostate was removed.

I was somewhat surprised that you already had been visiting your willows so soon after getting home. They are well known as medicinal plants, however, and doubtless were especially desirous of helping you back to full strength.

We will not need to worry about leaves longer than 6-inch blades because the original trouble-maker had leaves only 4-5 inches long on its cut-trunk sprout. I doubt not that you will find still longer blades some year when the season has been early and quite wet, with a late fall.

Mr. Sonn wrote me that they were full-up on manuscripts so I suppose that publication will be slow. I asked him to give your paper whatever status, in, sent earlier, had acquired, because I want to see you account of this species in print as soon as may be. There was no hurry about mine, which did not cover a controverted subject.

Have been very busy on many matters lately but hope to get back to willows soon and stick to them for awhile.

Trusting that your recovery stays complete and that the glorious autumn coloring last awhile, I am

Cordially yours

Carleton R. Bell

P.S. We have had such a freak season, with much drought, that leaves have been falling all during the summer. I doubt if we will have our full usual color.

Fr. George H. Turner,  
Ft. Saskatchewan,  
Alberta, Canada

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

June 24, 1948

Dear Dr. Turner:

An hour ago I mailed a manuscript that has run me ragged for weeks. It covers a discussion of the mixup between *S. arctica* Ballas and *S. arctica* R. Brown (*S. anglorum* Chamisso), of the varieties of *S. anglorum*, and of *S. petrophila* Rydberg and *S. caespitosa* Kennedy of our western mountains. I had to clean up the mess before I could finish my manuscript of the new Illustrated Flora.

Now I am looking around to see whom and what I have neglected. My first thought was of you and your fine service to me on *S. petiolaris*. Your card showed that I had not even sent you a copy of the publication, for which I am truly sorry. I am mailing three copies, together with a copy of willows of West Virginia. The latter will not interest you except that the senior author is a professor of mathematics and a splendid botanical collector. If you can use any more copies of *S. petiolaris*, please let me know and I'll send them gladly.

Just now I have received from the Harvard Univ. bot. institutions, the material which will let me settle the status of *S. athabascensis* Ray, *S. hebecarpa* Fernald, and *S. similans* Fernald, all closely related to *S. pedicellaris* var. *hypoglauca* Fern. which reaches nearly or quite to your area. (and *S. fallax* Ray)

Before the year ends, I want to finish the material for Illus. Flora, the Flora of Alaska, and the State of Idaho. Luckily, the problems I have to settle in doing all these jobs are basic to the final monograph. Was 75 years old on June 12, and my most noticeable (by me) present was a good case of shingles. Having had them once before, some years ago, I had a bottle of calomel on hand and soon had the situation under control.

With all personal good wishes for you, and appreciation for many helps, I am

Cordially yours,

Carleton R. Ball

From G. H. Tuckerm.  
Fort Saskatchewan, Alberta.  
July 24, 1948.

Dear Dr. Ball,

July 24, 1948  
Please forgive me for the long delay in writing to acknowledge receipt of your letter and of your two papers. The reason for the delay was my absence on holiday, at Pigeon Lake. I had had letters forwarded but not other mail, so did not get your publication until yesterday. Thank you very, very much for them. I am pleased to leave the 2 extra copies of the *S. petiolaris* paper to pass on to botanical friends when appropriate occasions arise. If I should need a few more copies I will take advantage of your kind offer to send additional copies.

I have read this paper with very great pleasure, and complete conviction as to the correctness of your conclusions. Your other paper I will study later, as soon as time permits.

The Botany Club of Edmonton is coming to Fort Saskatchewan on August 14 on one of their monthly summer "Forays", and I am to leave the honor of being their leader in the field for that afternoon. One of the items I plan to show them here is the series of *S. petiolaris* plants I described to you illustrating (1) growth of this species as single-stemmed small trees, (2) the

24-VII-48

large size attained by some plants, (3) the variability of twig color and (4) the large size of the leaves on young shoots.

I am extremely glad to know that your health enables you to carry on the important work you are doing in clearing up other confusions among the willows.

With best regards, and all good wishes  
I am

yours sincerely,

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

Dear Dr. Turner:

July 30, 1948

George H. Turner

Your letter of July 24 is here and I am delighted to know that you have been on vacation at Pigeon Lake. I had begun to fear that you were not fully recovered from your operation.

July 24, 1948  
p. 2

I hope that your paper on *S. petiolaris* will be coming out soon in Can. Field-Nat. I asked them to give it priority over mine, as I felt it more important.

Recently I finished a long paper surveying *Salix anglica* Cham. and *S. petrophila* Rydb., as well as Schneider's 3 var. of the former. Am. Midland Nat. has just accepted it. Because of the mixup, I cite large numbers of specimens.

You will render good service to botany on Aug. 14. Wish I could be there. Congratulations. Cordially yours,

Carleton R. Ball

Dr. George H. Turner,  
Fort Saskatchewan,  
Alberta, Canada.

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

17 August, 1948

Dear Dr. Turner:

Your letter of August 5 came promptly and the packet of willows reached me today, probably delayed by summer shortage of postal help. It was in excellent condition.

August 14 now has come and gone for you, and I would have been most happy to have been there, even if the Edmonton group had chosen the golden-rod or the rose tours instead of the willows. I know that you had a happy time and I am sure that they learned much and enjoyed more, with your guidance.

I certainly appreciate your efforts in getting further evidence of large leaves on *Salix petiolaris* in that area. Only through local men with knowledge, interest, and effort can we specialists ever hope to know what we need to know about plants.

It was generous of you also to send me the sheet with the largest leaf. This blade 6-15/16ths inches in length sets a new record. The largest I recorded in my paper, from your collections of August, 1947, was 6 inches long. Perhaps you sent some still longer at a later date last year. I have not checked our correspondence for that.

As your specimens were from different plants, it probably would have been better to have given them different numbers. If you decide to do that, please let me know. They could be gino letters a to d, following their present numbers.

I am listing them below, so as to have a paper record of the dimensions. For convenience, I have added measurements in centimeters also.

*Salix petiolaris* Smith. From four separate plants in the same willow colony, edge of small slough, Fort Saskatchewan, Alta. August 1, 1948. Vigorous sprouts.

|      |                |                          |                |
|------|----------------|--------------------------|----------------|
| 6402 | . Largest leaf | 6-1/8th inch.            | 15.6 cm.       |
| 6402 | " "            | 6-1/8th x 1 "            | 15.6 x 2.8 cm. |
| 6402 | " "            | 6-5/8th x 1-1/8th inches | 17 x 2.9 cm.   |
| 6402 | " "            | 6-15/16th x 1-3/16th "   | 17.9 x 3 cm.   |

I think I gave you an extra 1/8th inch on one of the above, where the two sides of the base were of unequal length and you apparently had measured the shorter side.

Have you had any word from Canad. Field-Nat. about your manuscript? If you had none longer than 6 inches when you wrote it, you ought to send an additional paragraph for insertion before they get out galley proof.

I shall be interested to know which of your three tours, the visitors finally finally selected. If any of them have hay fever they probably did not vote for goldenrod.

With all good wishes, I am

Cordially yours,

Carleton R. Ball

Fort Saskatchewan, Alberta,  
Oct. 4, 1948

Dear Doctor Ball,

Thank you for your kindness in writing me on Sept. 27. I suppose it is true of all of us that as we grow older our memories are more apt to play tricks on us. I hope you have found that you did not make a slip in changing inches to millimeters in your paper or that would put you to the trouble of having corrections made.

I have not yet received proofs of my paper in the Can. Field-Naturalist. Perhaps the fact that I wrote them, requesting the addition of an extra paragraph delayed the time of its publication.

I have just finished a task that has interested me, among other things, all summer. A neighboring school last Spring asked me to collect for them specimens of all weeds of this area, for their use in teaching. I mounted for them 100 sheets, comprising specimens of 85 local weed species. I enjoyed the assignment, and improved my own representations of all these species as well as my knowledge of them.

I have this Fall been much interested in noting, and studying, the tenacity with which our prairie rose, *Rosa arkanansa* Parter, (*R. suffulta* Greene), clings to its old habitat. I have been walking over stubble fields, and find that though only a fraction of the original colonies

survive yet a fair number of these have done  
so even on fields that have been under  
continuous cultivation for 40 years or more.  
Some of these colonies are present in strong  
and sturdy growth scattered over an acre  
or more of ground, springing up and even  
bearing fruit, usually only one terminal hip,  
on fields plowed last spring and seeded to  
oats or barley. Their leaves are now rose-  
tinted with autumn coloring, which makes  
them easy to find.

Far too late now our northern land  
has been tinted with marvellous coloring  
in the leaves of practically all trees and shrubs.  
If we never see a lovelier paradise we are  
at least content.

kindest regards and all good wishes  
to you and yours.

Yours sincerely,

George H. Turner

Oct. 4, 1948

p 2

Dr. George H. Turner,  
Fort Saskatchewan, Alta., Canada.

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

November 27, 1948

Dear Dr. Turner:

Your interesting letter of Oct. 4 came promptly. I was happy to discover that I had used only inches in my *S. petiolaris* paper, because Smith had published in inches and Fernald had referred to them. I will have to make changes in some records I made for my file on large leaf measurements in many species.

I am much interested in your weed project and congratulate you on the service rendered to the school. This is very important. My weed experience goes through boyhood on a farm, and many years in studying forage and grain crops for the U.S. Dept. Agric. Personally, I keep my lawn clear of them, which gives you plenty of experience on their persistence and growth habits. Last winter, I brought specimens of two species, a creeping mint and a chickweed, to the monthly meetings of our botanic society all winter, just to show them how vigorous weeds behave, even when snow and ice cover them part of the time. They still made fruit each month.

In recent years, I have been collecting lawn weeds in all stages, from the tiniest recognizable seedling to the mature plant. I have an enormous amount of material, in the various stages, of about 75 species, as I remember. I have suggested to the Dept. that they look it over and then distribute it to agric. institutions. They have not yet decided.

Your notes on the prairie rose fill me with memories. It covered the short-grass prairies where I was raised in the Big Sioux Valley between Iowa and So. Dakota. As the settlers broke the sod, the roses went under the turned sods. Where the land was sown to spring wheat, oats, or barley, the buried stems and roots sprouted and grew slowly. When the grain was cut in midsummer, the plants flowered and fruited sparingly, but grew vigorously and held their own, year after year. In crossing such sybuble fields on errands, or while fall-plowing them, we boys ate the hips for the sweet flesh, peeling it off the inner seed capsule with our teeth. And was it good! I still grab them when I can.

I have heard no more from my paper in Cand. Field-Nat but it probably will come out some day. More and more manuscripts are going in but are coming out rather slowly. Am just winding up Idaho willows for the State botanists and State forester and it has made me study *S. Drummondiana* and Piper's *S. vella* and *S. subcoerulea*. Result: the latter two are reduced to varieties of *S. Drummondiana*, which Piper did not mention. And so it goes.

We have had a quiet and thoughtful Thanksgiving Day. Hoping all is going well with you, I am,

Cordially yours,

Carleton R. Ball

Hart House, Alberta.  
April 5, 1949.

Dear Dr. Ball,

In adding six species to the reprint  
I sent you I now see that I included one that I  
should not have added - Elephantella granulata  
(Retz) Rydb. I was momentarily forgetting that  
on Dr. Peroldi's advice, I had already listed this  
plant as Pedicularis granulata Retz. I had  
always previously thought of it as Elephantella, and  
when I missed the name from the printed page I  
absentmindedly concluded that it had been ac-  
cidental omitted by the printer as Galeum triflorum  
had been.

omit) So if you will tear out my Elephantella insertion  
I believe you will still have the correct designation  
for the plant left.

Yours sincerely,

George W. Turner

Dr. George H. Turner,  
Fort Saskatchewan, Alta. Canada,

3814 Jocelyn St., N.W.,  
Washington 15, D.C.  
18 April, 1949.

Dear Dr. Turner:

I have received your letter of April 5 and the copy "Plants of the Edmonton District of the Province of Alberta." Congratulations on getting this published. It must have been an enormous labor to compile all the included data and to insure their correctness in proofreading.. I have removed the addition slip for *Elephantella*, in accordance with your request.

I have looked over the list of included willows and thank you for your references to my determinations of them. On three I will make brief comments.

It seems too bad that you should have followed Fernald in his complete blunder regarding *Salix petiolaris*. He revived an assumption discarded by all American and British botanists of the past 125 years. In my paper on *Salix petiolaris* J.E. Smith: American, not British, I showed plainly where he was off on every conclusion, and why. My reprint probably reached you after your manuscript had been submitted but it would have been simple to change that sentence.

If you have in press (or preparation) a special paper on your studies of *S. petiolaris*, of which you so kindly gave me the benefit, I hope you will carry the species under its correct name. As I wrote you previously, I cited you larger leaf dimensions but did not go into any extended discussion of them, in order not to detract from your paper.

I note that you omit *S. discolor* var. *principis* (Pursh) Andersson. It is the more common western representative of the species and I believe that I named some of your specimens as the variety. It is marked by distinctly dentate or crenate-dentate leaves and usually slender stems.

I note that you have included ~~him~~ under *S. fallax* Raup the specimens I identified tentatively as *S. "glauca"* Andersson. I myself determined as *S. athabascensis* some of Brinkman's and Kreitzberg's specimens which more probably belong to the "glauca" complex. I have just completed a manuscript showing that *S. hebecarpa* Fernald and *S. similans* Fernald are not species but hybrids of *S. pedicularis* var. *hypoglauca* with some other species, probably *S. arctophila* or *S. cordifolia* var.

I have not yet been able to study *S. athabascensis* Raup and *S. fallax* Raup. I believe, however, that they are the same thing, one the smaller and the other the larger aspect. I suspect also that they are hybrids of var. *hypoglauca* with some members of the "glauca" groups, of which *S. desertorum* Richardson is one of the oldest names. Hope to get a chance to study sufficient type material to decide soon.

Will send copy of my latest reprint, in which I had to reduce two of Schneider's three new Hudson Bay species.

Trust that you have had a pleasant Easter-tide, and that spring is with you too. We had summer in midwinter (temps. in the 90s) and the most windy March and April ever, with much cold and almost freezing night before last.

Cordially yours,

Carleton R. Ball

Fort Saskatchewan, Alberta  
April 23, 1949

Dear Dr. Bell,

I have just received your letter, and this brief note is only to tell you how terribly sorry I feel that S. petiolaris got by in my Edmonton flora as S. gracilis Anders. My manuscript was already in the hands of the printer at Ottawa when I learned from you that the Rhodora 48: 46-8 (1946) paper of Prof. Fernald just came to my was erroneous. I was utterly convinced of the correctness of your position, but am still without any doubt as to that correctness but alas I had forgotten that my paper when sent at Ottawa had the erroneous naming, and by the time the proofs arrived for proof-reading I was so utterly distracted by the hopeless illness of my dear wife that I made a hopeless & poor job of correcting. So much so that I did not even notice that I had the species named wrongly, and sent it back as it was.

(Mr. Turner has irreparable cancer of the liver and is slowly sinking in an Edmonton hospital)

Please forgive me my blundering in this matter. My short paper on S. petiolaris is of course, as it should be, not the least to (over) please forgive me. I have not the heart to refer to the other items I am sending, S. H. Turner (See over)

P.B. Thank you very much for your  
paper enclosed with your letter

Sincerely  
S.W.Y.

Digitized by Hunt Institute for Botanical Documentation

Fair. Ban'atowan, Alberta  
Sept. 29, 1951

Dear Dr. Ball,

yesterday in the river valley  
near where I had found my diamond  
willows 7704 and 7707, I found  
another which I believe to be S. discolor,  
leafy twigs of which I enclose herewith for  
your opinion. If you agree with me as to  
its identity, the question of discolor's  
diamond-bearing abilities will be settled  
once for all, since I am sure that  
most of the diamondiferous willows I  
saw at Pigeon Lake were the same  
species as this - 7718.

Digitized by Hunt Institute for Botanical Documentation  
If you are able to confirm this de-  
termination, I will have pleasure in  
sending you the lower  $\frac{2}{3}$  of the stem  
I have cut from this plant. I will  
keep the upper part, which also bears a  
few 8000 "diamonds", and will consider  
its value double since you will have  
part of it.

This willow had 7 stories of diameters  
from 2 inches up to 6 inches. I had es-  
timated its height as 19 ft., but after  
data exposed

(See over)

cutting down the stem I wanted I found by actual measurement that it was  $2\frac{1}{2}$  ft. So I am now sure that some of the discolors I saw at Pigeon Lake were over 30 ft.

All 7 stems of 7718 were diamond-bearing to some extent, but of course I cut the one with the best specimens and the largest number.

In my search yesterday I was interested in finding a Salix Trebbiana growing in open upland, near a creek on the golf-course, which was a single-stemmed tree with trunk nearly 10 inches in diameter & about 4 1/2 ft. high, then dividing into many branches. It must be close to the largest Trebbiana I have ever seen. It showed no diamonds, however.

With best regards,

Yours sincerely,

George H. Turner