Acd. Nov 22 1869
Ans Jan 2 1870

New Haven, Ct.
April 19th
69.

George Engelmann, M.D.
St. Louis.

My dear Sir,

I have been for the last two years with the government party under charge of Clarence King, Esq., engaged in the geological exploration of the territory along the 40th parallel from the California line eastward, and have brought home a considerable collection of dried plants. May I ask your assistance in the determination of the few cacti which I found in that region?

You can judge little, I very well know, from written descriptions and as we shall soon return to Salt

Lake to complete the work that is left to be done between there and Green River, I can if necessary bring you the rattlers in perfect specimens which I have here.

Meantime I will describe them as well as may be.

Op. hystrix?

No. I. — With broad orbicular joints (in my specimen, 6' long by 4' broad & 3/4' thick, upon a cylindrical stem, 1½' long & 1' in diameter,) — lateral pulvilli nearly an inch apart, more crowded on the edges & towards the apex — spines about 6, very unequal, spreading, the longest one 2-3' or more in length, more or less brown or purplish. Flowers, in July, annual from the upper edge, large (petals 1½' long) bright yellow or deep purple, more frequently yellow — fruit 1¼' long by ½' in diameter, dry, prickly. I enclose a few and s. This was frequent in the valleys from Salt Lake westward, at an altitude of 4-6,000 feet, diffusely branched, & very handsome in flower. It seems to be nearest Opuntia hystricina, O. Kansana? O. Wahuensis?

X What must be another broad jointed Opuntia considerably smaller, grows upon the mountains in the western part of Nevada, but I did not meet with it in flower or fruit, & have no

specimens.

O. pulchella

No. II. – A more or less elongated, cylindrical, pyramidal stem (1'-6' high by 1/2' in diameter) with a cluster of annual cylindrical branches at the summit, (1-3' long by 1/4-1/2' in diam.) simple or branched, – Stem smooth & unarmed, or closely tuberculated, then pubrillic crowded with short stiff prickles (1"-1 1/2" long) at the base especially, – the branches tuberculated, with stiff flattened spines, variable in length but not exceeding 1 1/4', black, brown, purplish, or white – spreading, smaller ones usually numerous.

Flowers terminal, purple, petals 3/4' long. Fruit dry, obconical (3/4' long by 4" in diam.) Ripe and not found. Papillae upon the fruit crowded with slender bristles 1/4' to 1/2' long.

The stem is woody. In some I counted as many as 25 annual rings. Flowers often numerous – sometimes so in a head. Found with the last in the valleys in the central part of Nevada, between Austin & the East Humboldt range. Flowering in June & July.

I enclose a single branch. & flowers

No. III. may possibly be the same, met with on dry foothills in the western part of the state, but neither in fruit nor flower – apparently stemless, the divaricate branches forming a dense globular head 2-3' in diameter, densely armed with much longer spines, 2' or more long, deep brown and flattened.

= Gabbs ?

No. IV. is a Mammillaria, growing upon the mountains at an altitude of 8-10,000 feet, from the ~~the~~ Reese river eastward to the East Humboldt Mts. – Globular, 2-6' in diameter, solitary or scattered in a cluster, flowering at the summit. Tubercles ½" in height – spines 20-30, spreading, straight, about 6 stouter & longer (not exceeding 1') more or less brown at top, the rest white and ½ to ⅔ ds as long.

Flowers small, greenish yellow, petals ½-¾' long. I were successful in finding the mature fruit. I enclose a flower & a few tubercles. Reaction, purple in the center like a ripening watermelon, but of course solid. Spoken of by some of the party as a common cactus in Arizona & often resorted to as a supply of water when other sources fail, the half roasted head yielding a considerable quantity.–

I trust that you will excuse the liberty which I am taking, as I know the interest which you have shown, & success, in working up the natural history of this order.

Please address in reply, to care of Prof. D. C. Eaton,

Yours Very Respectfully
Sereno Watson.

Rec'd Jan 17th
Ans same day

Watson

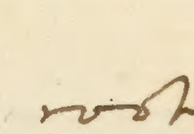
New Haven, Jan 18th 70

Dear Sir,

Your favor of 2d inst. was rec'd some days ago, for which accept my thanks. I learned soon after sending you my letter that you were on a visit to Europe, and therefore have not been at all surprised at not hearing from you. On the contrary, I scarcely expected that it would reach you.

I have been west again with the party this season, but not beyond Salt Lake — spending most of the time among the Wahsatch & Uintah Mountains. The most frequent, almost the only cactus seen here was the O. Missourien-sis. I do not remember meeting with the O. hystricina, which was the more common of the two in Nevada. In Salt Lake Valley the O. fragilis, (as I suppose it to be) was not

rare. The joints of the O. Missouriensis are sometimes very large – 8-10' say, in length by half as much in breadth – while they might not be more than 2" in thickness. The fruit was occasionally 1½' long, deeply pitted, & nearly unarmed.

On the divide over the Wahsatch where the Pacific R.R. crosses the range, at an elevation of 7,000 feet, I gathered some joints of an Opuntia, which I do not find described – possibly your O. Utahensis. They are about 2' in diam., broad elliptical, the older joints becoming somewhat semi-elliptical as they rooted from the lower edge – something like this,  fragilis? – the sides thickly beset with short stout spines, all reflexed & almost appressed, the longest less than ½' in length; upon the edges the spines are twice longer & nearly erect; flowers apparently small, & fruit not over ½' long. Can you guess what it may be? No! it is Mammillaria vivipara

The spines are arranged much as represented in your plate of O. strigil.

Where will I find descriptions of O. pulchella

St. Louis Transact. II. p. 197. (1863)

& O. Utahensis?

In working up my collection (which includes some 18-20,000 specimens) I have been almost forced to index the botanical literature of the country, so far as it was within my reach. The result as yet is, of course, imperfect. Though Prof. Eaton's library is tolerably full in publications upon American botany, I may possibly be able to make it complete enough to be worth the publishing — after the report upon my collection is off my hands. Prof. Eaton has cited of your publications, e.g. on Cuscutae, Synopsis of Cactaceae, on Mexican collection, & others in the Pac. R.R. & Mex. Boundary reports. Will you please inform me in what journals, or in what other form, your other botanical ~~publ~~ contributions will be found.

Yours Very Truly

Sereno Watson

Dr. George Engelmann

St. Louis, Mo.

Rec'd Jan 26
Ans same day

New Haven, Jany 21st 70

Dear Sir,

Your favor of 17th at hand. I enclose specimens of the Opuntia mentioned. The spines become twice & three times longer.

Prof. Eaton has of yours

Willdenowii, 1848.

Cascadensis, 1842 (Hill, Jones)

Cuscuta, 1859.

Cochacense, 1856.

Diacomus grassus, 1859.

Junci, 186[illegible]

& loose shuts

Kibiscus & Cornus

N. American Grapes

Impatiens polycarpolemon

The St. Louis transactions may be in the College Library — I will inquire.

Drs. Torrey & Gray have just spent a couple of days here. They advise me to complete my Index & promise its publication - will endeavor to get the assistance of the Smithsonian Institute.

Very Respectfully

Frank Watson

Recd April 11th
Ans — 15

New Haven, April 6/70

My dear Sir,

Your favor of 1st inst. and I send you by mail today all that I have of the Mammillaria in question.

I think I stated that it was found only well up on the mountains — say 7-8,000 feet alt. in Lat. 39°-40°. —

Your pamphlets came safely for which accept my thanks

Yours very truly

Asa Gray

Dr. G. Engelmann
St. Louis

Rec'd May 25th
Ans — 30

New Haven, May 23d 70

My Dear Sir,

I recd duly your favor of 15th inst. and the returned specimens.

May I ask of you a favor? My report is to contain tolerably full English descriptions of all the genera and species of my collection that do not come into Gray's Manual, & also of such others as have been previously found in that region – i.e. Utah and Nevada. It will be in fact a beginning towards a general Botany of our western Flora, gathering together information that can now be found only in some of different publications, & will be supplemented in good part by Prof. Brewer's Botany of California

which will be published in two or three years without doubt. Of course this is no attempt towards such a thoroughly complete work as only Dr. Gray can prepare, yet the more complete it can be made the better. Will you undertake the Cactaceae for me? They are not many, but you can do the little that need be done much better than I and in less time — and the time given is so limited that I am glad to put upon others what I can.

The Cupuliferae and Juncaceae too, may I not send you them? They are very few and many be only common forms — I have not examined them yet at all. Not many are reported from that region.

The reports in the pottery are in good style, and I am promised 50 illustrations if I wish them. If you should find anything worth

tipping and will have the drawings prepared (at my expense) we will have them engraved here.

By the 1st or middle of July will be soon enough for the work, and I cannot suppose that the work would take any very long time. May I not so far depend upon your — for the good of the cause?

Yours Very Truly
Severo Mateson

Dr. George Engelmann
St. Louis, Mo.

Rec'd June 28
Ans. July 1

1768.
884

June 24th 1870.

My Dear Sir,

I thank you for undertaking the Cactacea for my report, and will not trouble you with the other matters. I have looked over my Cereus and find only your C. Texensis flora and C. Californica, Chiron. gracili flora, the latter much the most frequent, though both are rare.

I enclose some Lemnas which I would like you to look at, though I do not know they are determinable, as

I can detect flowers or fruit only upon the (a.) form. The Spanish Spring specimens may not be the same as the ground are marked by a strong posterior nerve but otherwise are nearly or quite nerveless — I see nothing in Herb. Gray just like it in that respect. The other floating rootless Triculca-like thing I can make nothing of. Ex. cept that all of my L. Triculca is just as rootless I should guess that it was a Wolffia. Dr. Gray has not compound microscope at hand, so that point could be settled at once. —

Hoping that you will not get out of patience with my questions I am Yours truly Sereno Watson.

Rec July 13
Ans — 26

New Haven, July 8th 70

My Dear Sir,

Your favor of the 1st inst. is at hand. Once more I take the liberty of sending you some troublesome subjects —

Isoetes echinosporus, Durr., var. Braunii — apparently from alpine lakes in the Whites.

Marsilea, apparently the same as the following specimens in Herb. Gray.

254 (?) Hall & Harbour. — Pickered M. vestita.
125 Lindh. 1849. " M. macronata
from Mr. Hale — W. Louisiana " M. quadrifolia
746 Lindh. 1847
404 Wright 1849
811 " 1849
2112 " 1852
} New Mexico — unnamed.

I have no means of determining what it

really is.

Chara, from half a dozen different localities — evidently three species.

Dr. Gray's Herbarium gives no help to him. If you prefer sending them also to "headquarters" please do so.

Yours Very Truly

Ezra Brown

Pray excuse my negligence in so long imposing my postage upon you.

S.W.

Recd Aug 4th
Ans Aug 5

New Haven, Aug. 1st 70

My Dear Sir,

I have your favor of July 26th. The printers promise to take up my report early in September. I hope to receive your sheets upon the Cactaceae in good time, and am not sorry that more time is given me than was first proposed.

I found a species on the summits of the E. Humboldt Mts. (10,000 feet) which I am

disposed to consider a form of P. aristata, though Prof. Eaton thinks it distinct. It answers to the description perfectly & to specimens of the Colorado species, except that the corona is a little larger, & lighter colored, & the anther has conspicuously developed — but the few Dryden climate of Mr. Wooster may account for the difference. I will send you a specimen.

Yours very truly

Asa Gray

Serno Watson

Rec'd Sept 28
'90

New Haven, Sept. 23 '90

My Dear Sir,

I am very much obliged to you for your letter and notice of 18th inst. My Pinus contorta is wholly of the broad-leaved form, as supposed by you. Abies Engelmannii was found (50° high) in the E. Humboldt Mts. (a high range nearly intermediate between the Sierras and the Wahsatch) on the western slope at an altitude of 9,000 feet, also in the Wahsatch at the same elevation and in the Uintahs rather forward down, where it is known as "white pine." What I took at first for A. nobilis proves to be A. amabilis, Forbes — which is very near

A. grandis, but I do not know that they were together. It was collected in the Wahsatch and Uintahs with the last. In the young cones the bracts are expanded beyond the scale as in A. nobilis, whence my mistaken. A. grandis I found in the Sierras above Carson City (where it is "White Spruce"), in the Boise Creek Mts. (where Nevada and Utah come upon Idaho), and in the Wahsatch and Uintahs, at 6-8,000 feet altitude. Bark much as in A. balsamea — cones rather difficult to procure as they are soon destroyed by the squirrels. I send scraps. The leaves are very variable. A fine tree, but East of the Sierras the species do not attain the vigor of the Pacific Coast more

approach them — do look about I have been.

I have never been able to find any notice of P. Balfourii though I had heard of it. When is it described? I do not see that Parlatore ~~takes~~ makes any mention of its station.

How soon may I expect your hold on the Catacecas? I shall be ready for it very soon now.

Yours very truly

Byron Walson

Rec'd Oct. 7 1870
Ans. March 9 1871

27 May 1872
Ans.
Oct.

Rec'd Spring St. 13 July 1870

New Haven, Oct. 3 70.

My Dear Sir,

I think that Mulenbergia was not my fore out of the way in his conjecture of those constituents the true Aliena amabilis and a. grandis, judging from my own experience of what I take to be the same trees. The scraps sent you are just together as they grew, and not merely as I understand them. The acaline from the large cones are from the trees having the short acute leaves — the smaller cones from the obtuse leaved trees. The latter was much the most common, the first being

seen by me in bloom ~~in~~ a single locality upon the Wahsatch, though collected by Prof. Eaton in another canon of the same mountains. As to size and habit there was nothing distinctive in those that I saw.

Some of the less densely hairy twigs of A. grandis sent you are from young trees growing in the shadow of the larger ones, — from the Sierras near Carson City.

Parlatore says that he has seen ~~the~~ common sunt homes by Douglas of A. amabilis. Was he mistaken?

Hoping that you will be able to send me the Cachuse papers very shortly (the order comes so early in the Flora that it will

not to delay it till the printers have begun upon the MSS.) I remain

Yours very truly

Byron Walson

Dr. George Engelmann
St. Louis.

Rec'd Feby 17th
Ans Mark 9

New Haven, Feby 14th
11.

My Dear Sir,

I had determined not to cry "wolf" again when there was no wolf, and so have waited until I should have certain evidence that the printers were at work before I troubled you again. Now that I have seen the first proofsheets of my report, I can with a better grace ask you for the promised notes upon the Cactaceae.

If, however, you choose to make the article more full than at first proposed, including new species or new matter, or even a summary or synopsis of any or all the genera, I will be very glad to have it, and in this latter case it can all go into the "Appendix", which will probably not be reached for a couple

of months. This appendix will include much of a like character in regard to other orders, and Dr. Gray proposes to furnish for it the notes which he is now preparing upon the Labiatae.

Have you completed your revision of the Coniferae, and what conclusion did you reach as to the relations of Abies grandis and amabilis?

Have any additions or changes of note been made in our Cucurbitae since the publication of your Revision? I find none published. So of Juncus.

As soon as this Report is off my hands I shall be ready to proceed with my "Index", of which Prof. Brewer has informed you. It is more his "hobby" than mine and I do not much fancy the riding it, but as he a few days ago informed me that he was prepared to fulfil his part of the conditions, I must try and do the best I can with

it. Any help that I can get from others will, of course, be most thankfully received and I was very glad to hear from him that I might depend upon you for all relating to the Cactaceae.

Hoping soon to hear from you I remain

Yours Very Truly

Ezra Watson

P.

Dr. George Engelmann

St. Louis.

Rec'd March 21st
Ans. same day

Washington, D.C.
Mar. 17th 1871

My Dear Dr.

Thanks to you for the Cactus Mss. which is just at hand and just in time. My own bare list had gone into a compositor's "take" today with a footnote referring to the Appendix for your fuller account, which I still had faith to believe would come.

Very slight modifications will make your Mss. all right, and just what I wanted.

But should not Opuntia fragilis be added? I think I mentioned in some letter having collected what I took to be that species from the west bank of the Wabash in Jordan Valley. It does not answer to any that you

describe, and I will include it provisionally until you vote it.

In Herb. Gray there was also a specimen collected by Dr. Bloomer on Mt. Davidson near Virginia City, that accorded well enough apparently with the description of D. [illegible], Eng. & Brig. Is it very improbable that that determination is right?

Your Yucca notes will be very acceptable.

If there is anything more sure certain than a Gov.t printing office, deliver me from having anything to do with it. Work was to have begun on my reports certainly by 1st November, was then delayed till February, went on three weeks and stopped, and I have now come here myself, got it started again, and if any

sort and amount of moral suasion will keep the wheels moving they shall not stop again. I hope to live to see it through.

Having now my collection all determined I shall soon be able to proceed to its distribution into sets. I am now preparing a list for the purpose. In their final distribution I shall be happy to include you among the grantees and to do the best that can be done for you, but it will of course be as from Gov't and gratuitous. I have no herbarium of my own and intend making none. Am too much of a wanderer for that.

Again thanking you for your kind assistance, I remain

Yours Very Truly
Sereno Watson

Address
Care Prof. S. F. Baird
Smithsonian Inst.

Recd April 22
Ans Decy 28

Washington, April 18th/71

My Dear Sir,

Yours with revised proof came to hand late evening. I am very sorry to have to say that the alterations cannot be made: On account of the limited amount of "letter" which is used, it was necessary to make up the paper in order that the matter following the Cachacuan might go to press as soon as ready. I had detained this one form for your corrections. Unfortunately, however, it was sent to the printing room and has been worked off with the rest. I am worried about it but do not see that there is any help for it.

There is not enough of serious importance in your corrections to justi-

by the expense of a second edition for this signature, and indeed so for as your own matter is concerned a few words in the "Errata" will set it all right. As for my own notes, they must go for what they are worth. No one can consider you responsible for them.

Your criticisms are taken good-naturedly, as I have no doubt they were intended.

Yours Very Truly

Asa Gray

Dr. George Engelmann

St. Louis.

Ans May 25 1881
2 6

310 Indiana Ave.
Washington, D.C. May 15/81

My Dear Sir,

What is the authority for Lemna Valdesiana? (L. Torreyi.) I have examined all the books at hand and do not find it.

How soon may I expect the Cucca Mitchi?

Yours Very Truly
Sereno Watson

Dr. George Engelmann,
St. Louis.

Rec'd June 3rd
Ans — 24

310 Indiana Ave
Washington, May 31st 71

Dr. George Engelmann,

My Dear Sir,

Your favor of May 26 is at hand. Thanks you for the Lemna information. It is too late to make use of the Cactus drawings, though I would have been glad of them since I was getting my own illustrations up. I had the pleasure of looking through your report and read your notes upon Ephedras. Dr. Palmer has again collected your E. fasciculata, which however was not the common form in my region and is, I take it, only a variety of E. occidentalis. But I put your name on record, so that if it proves distinct

you may have the good of it. Dr. Palmer has also collected again that old odd form that Dr. Torrey called E. trifurcata in Emory's report, a perfectly good and very interesting species, I think.

I would like your Yucca MS. pretty soon — say within three weeks. I will promise you that your corrections will get into the form this time.

I have been to keep my eyes on everything that is doing, and cannot get any work done right then.

Yours very truly
Sereno Watson

Rec'd. I have copy of note.

Washington, July 15th 79.

My Dear Sir,

All in good time. Your alterations are understood, and I think your little article will be done this time to please you. It goes in connection with the Appendix, hence the change of type. An alteration of the heading was necessary and I am glad of your suggestions.

I am sorry you are not satisfied with the phraseology of Note III. I propose changing it to "Each leaf marked with the impressions of the teeth of those next to it".

Plants not distributed yet. Yrs very truly

Byron Watson

Rec'd Dec 9
Ans Feb 6

Northampton, Mass.
Dec 7th 71

Dear Dr. Engelmann,

No Lorantha-
ceae of any kind occurs in my
collection. Arceuthobium oxycedri
or the like should be found in the
mountains of Utah but is escaped
my notice.

Shall have a partial set of
my plants ready for you
before long.

Yours very truly
Asa Gray

Rec'd Feb 27 1872
Ans Mar 8th

Cambridge, Feby 16th 72

Dr. George Engelmann,

My Dear Sir,

I am pleased that you are favorably impressed with my botanical report and thank you for your friendly criticism.

You will notice numerous little typographical inelegancies and errors scattered through the book, for which I do not hold myself responsible, as close watching on my part could not prevent them. It is impossible for the Gov.t Press, as at present conducted, to turn out really first class work, for neither managers, foremen nor proofreaders know what such work is. Some Congressmen have been down upon the extravagantly expensive style in which the reports are got out, but with no good reason. The entire actual cost of this volume to Gov.t, from first to last, has not exceeded $15,000 certainly — a pretty close calculation makes it less than $12,000 — which evidently leaves very

little room for "jobbery." Considering that Congress, the same day almost, voted $50,000 toward the reception of the Japanese Embassy, I think that our consciences need not trouble us severely for this little attempt at making a decent looking volume.

As for the matter, if you find no more serious faults than those which you mention I shall be happy. There was abundant opportunity for an experienced botanist to make blunders, and I have no idea that I have escaped. If it is shall be found that I am generally correct and that not many of my expressions are without a purpose and meaning, I shall be satisfied.

As for the conifers, I followed as most convenient the same arrangement of genera as is given in Gray's Manual, letting Abies include both Abies & Picea, which necessitates mentioning some characteristics which you speak of as generic but which are here only sectional — i.e. the position of the

course of falling of the leaves. The generic character of Pinus in the Manual describes the leaves as semicylindrical when binary, and my "deeply channeled" leaves of P. contortus should of course properly have been followed by "when dry", though it is my impression that they become somewhat so while yet upon the tree. The character of the sheath differs considerably, as you may well know, in different species, and as the leaves of P. flexilis & Balfouriana are described as smooth, it is well enough, perhaps, that in the two other species the "scarcely roughish" leaves of the one should be contrasted with the "scabrous" margined leaves of the other. I refer to the sheath scales in P. Balfouriana as "numerous" and in P. flexilis as "small". Are they not more numerous in the one than in the other? I judged as from the specimens I had.

Thus there is a shade of method and reason in most of the points which you mention. In regard to the young P. mac-

nophylla it struck me that there is something unusual in its habit of retaining its short juniper-like leaves until it is a foot or two high, without any of the ordinary teeth form or with but here and there a scattered one. Certainly I have never noticed like cases in other species. Mr. Meehan in a recent number of the Naturalist speaks of the leaves of the Colorado P. edulis as at first entire but splitting as maturity in the second summer. This is not true of the P. monophylla of Nevada, I am very certain.

Much of the Appendix, as well as the whole of the Introduction, was put in shape in Washington while waiting upon the printers. It was too much to expect of Prof. Eaton that he should contribute to it, as his elaboration of the Compositae was barely finished in time.

The omission to note the capitate stigma of the Cucurbitae was, I presume, simply an oversight. The discovery of Sicyos

Rec'd Febr 27. 1872

maritimum must have been too recent for mention, as you say in your letter of Nov. 8/71, in answer to my inquiries, "Nothing new about Cuscuta, nor of Jussiei." I would have been very glad to have had you give a fuller conspectus of the Cactaceae and indeed suggested it in one of my letters to you. I presumed that you were too busy to attend to it. Are you quite sure that I used such an expression as "like Gray's Manual"? I think not and do not know how I could. Perhaps my scrawl was more than usually illegible.

The Circaea puzzled me. I have not yet seen Dr. Atchesson's article & must hunt it up as I am curious to see what he found to distinguish it.

The only specimen of Allium stellatum ~~that I~~ in Gray's Herb.m is from Saskatchewan. It comes again, well marked specimens, just now in Hayden's col-

lection from the Yellowstone region. Hall's collection from Oregon, which Dr. Gray has been determining, has led to the detection of some errors in my Catalogue. My "Ranunculus orthorhynchus" is not Hookers, of which Hall has an abundance, but is the R. adoneus, Gray, of Parry's collection, again found by Dr. Green in Colorado this season. My "R. fascicularis" is something else. "Sisyrinchium Californicum" is your S. inciscum! and it is strange that I did not recognize it. Thelypodium lasiophyllum is omitted unaccountably from the list of the species of that genus. "Thypanocarpus elegans" should be T. curvipes as the older name. "Rosa blanda", and what has often been called such, Dr. Gray concludes to be R. Californica, and my "R. fraxinifolia" more properly the real R. blanda. My "Cercocarpus breviflorus" on comparison with the original specimen, which I had not seen, proves not to be that species, though with similarly small flowers

and fruit. As it is decidedly distinct in these respects and in its habit from C. bidifolius, it should be, I suppose, a new species. "Oenothera marginata, var. purpurea", is Oe. Wrightii. "Penstemon centranthifolius" Dr. Gray considers a distinct species, ("P. miniatus,") not P. imberbis.

Dr. Gray is also disposed to suspect two or three of my new species, as the Lonicera and Polygonum, and I do not know how many more. I am pretty confident, however, that most of them will hold good. Mr. Olney has changed his name for a few of the Carices and added one.

If the blockade of the Pacific Railroad is ever opened I expect instructions from Mr. King that will authorize me to send you one of the sets of my plants, which will probably aid you in determining your Texas collection. If I can help you in any way towards it I will do so with pleasure.

Excuse my too long letter.

Yours very truly

Sereno Watson

Recd May 24 46
Ans June 1

May 22d 1872

Dear Dr. Engelmann,

Dr. Gray is very busy, especially in arranging the spring work in the garden, and hands me yours of 25th ult. to acknowledge, in despair of finding time to do it himself.

It seems that the specimens of A. balsamea sent you long ago must have been from one of these trees. Of these two have been cut down and the remaining one is quite young and will not flower or fruit this season. I find however in the herbarium

garden specimens as enclosed, upon two sheets, one dated 1853, the other without date. I also send in separate packet specimen of "supposed A. Fraseri, from Mansfield, Vt., but A. balsamea", collected in October, 1860, as well as a single young annual collected in the same locality in July of same year.

I get no trace from books at hand of your A. robusta.

Alisma stellatum received and planted.

Dr. Gray can make

no guess as the coloring matter of the oak bit.

Dr. Chapman's address is found to be "Rome, Georgia" — where he has established a drug store.

Dr. Porter sends fine specimens of Arceuthobium.

Allow me to correct you as to date of publication of Hooker's Flor. Bor.-Am. It was issued in numbers, commencing in 1829. Parts I. = 48 pp. in 1829. Parts II. & III, to p. 179 in 1830, & so on.

So with H. & A. Bot. Beech. which was commenced at least as early as 1837.

I find in Dr. Gray's Library sheets of what seems to be a for publication, headed "On the geology & natural history of the Upper Missouri", and containing a chapter by you on "Botany". Will you tell me when & where it was published?

Yours very truly
Ernest Ingersoll

Your letter & fir branch of some time ago were duly rec^d. A good field for somebody to work in, if he could be found.

Cambridge

Acc^d June 29th
& July 1

June 26th
1872

Dear Dr. Engelmann,

In the collection made by Lieut. Wheeler in S. Nevada and Arizona last year (by Ferd. Bischoff, collector,) there are a few Cactus & Yucca seeds, of which I send you samples — not to name, but as probably of interest to you. They will be planted here and also sent to the Agric^l Dep^t at Washington. There is

nothing else, leaves nor flowers, accompanying them, save perhaps half-a-dozen pressed cactus blooms.

The seeds in the first long paper are labelled "Balm-bosch", and those of the other Yucca "Balm-bassi", from which may be inferred some difference of habit.

There is scarcely a date, locality or note of any kind to be found, and the whole collection is exceedingly scrappy.

Dr. & Mrs. Gray left for the West on Monday evening, to stop a day or two in Chicago. Yours very truly

Serno Watson.

Rec'd July 12

HERBARIUM OF HARVARD UNIVERSITY,

BOTANIC GARDEN, CAMBRIDGE, MASS.

July 5th 1876

Dear Dr. Engelmann,

Dr. Gray has sent you today flowers from the Hesperaloe now in bloom in the Garden, originally from Mrs. Lord's seeds of a good many years ago, and showing the characters which you give to the genus in your description. The flowers sent by you some time ago from the Nueces River must certainly belong to something else. The one apparently the same as some that came to me from Mrs. Young, collected on the Rio Frio, W. Texas (very nearly the same region). Nothing but the flowers. They might belong to an Aloe. I find no descriptions of any Mexican aloes, and no trace of but one, "A. Sabila, Karwinski", in Steud. Nomenclator, of which I can learn nothing more. Greggs 583 looks much like A. vulgaris. Something for you to see to — after

you are done with the Conifers, &c.

Yours very truly

Sereno Watson

Rec'd July 4th
Ans — 14

Agave

Cambridge, July 5 1872

My dear Doctor,

Your favor of 1st rec'd. Thanks for the names which I did not expect.

We have Yucca filamentosa and angustifolia in the garden, both perfectly hardy, and the first will be in bloom from next week on. I will see what can be done in the way of fertilization as you propose.

Wish I had time to run around among the pine woods myself.

I send you another box today containing what I hope will please you — specimens of the lovettes of Wheeler's collection — all

found apparently in Southern Nevada. Also the cactus flowers asked for, and some other cactus prickly, overlooked before. Keep them all. The Arcanthobium are to <u>numbered as you take them out</u>, 1. 2. 3. 4. 5.

What do you make of the enclosed ticket? I am thankful enough to guess at most anything and have deciphered most of Bischoff's notes, such as they are, but this one "gets" me, though the words seem plain enough. I ask for the curiosity of the thing.

Dr. Gray was heard from at Chicago, getting on nicely & Mrs. Gray already feeling the good effects of travelling.

Yours very truly
Asa Gray

Recd July 26th
Ans Aug 9

Cambridge, July 22
1872

My Dear Dr. Engelmann

I sent you this morning box containing handful of young cones of supposed Abies Fraseri of Mansfield Mts. (collected July, 1860) — also specimen of the real thing, if there is any, from the Mts. of Carolina, collected by Buckley.

It seems that Prof. Sherlock was visiting in Mansfield in July 1860 and took to the Abies, finding as he supposed both A. balsamea and A. Fraseri. He sent specimens of both to a friend in Boston, which reached Dr. Gray, and now a portion have reached you. The Dr. wrote to

him to get it provide nature
Conner and Prof. Wheelock went
again to the same locality in
October. He sent for the cones
of his Fraseri a quantity of
such as you already have. Whether
he made a mistake in identify-
ing his trees or not, I don't
know. There is, at any rate,
no difference among those he
sent.

Keep the Lobanthus.

Have seen nothing Agaraceous
in Bischoff's collection. I have
come across little that is new
— a second Petalonyx, a new Lepharia,
Nuttall's Oxytenia, &c.

Have been experimenting with the
Succas. Some of the ovaries
are evidently fertilized, others
fail & drop off. Yours very truly
Sereno Watson.

Reg'd Aug 5
Ans'd Aug 9

Cambridge
Aug. 2d/72.

Dr. George Engelmann

Dear Sir,

The boxes of Cactii from Prof. Agassiz are not yet received at the Museum here. The Curators promise to notify you of their arrival and to forward as soon as possible.

Dr. Gray writes from Yosemite that he is having a "grand time". He is probably by this time

on his return towards Colorado.

Bischoff collected in the mountains of Arizona Pinus flexilis, Balfouriana, ponderosa and edulis, and Abies Douglasii, Engelmannii and (foliage only) concolor and what I take to be grandis. Will send you specimens of the last (and any others if you wish) though not of much account without the cones.

There is but a single Agave, and Bird capsules only of that, which from their small size seem to be A. Utahensis — this big ⊙, or a little larger.

Yours very truly
Edward Palmer.

Rec'd Oct 14
Ans 15

Cambridge, Sept. 19. 1872.

Dear Dr. Engelmann,

Your favor of 9th ult. came duly to hand. Excuse delay in answering it. Rev. Mr. Foster of Bass River, N. B., is now here and says the Ab. balsamea is abundant in his region and I have asked him to send you and me specimens of the thing, and have also set him on the look out for Ab. fraseri. I find the original letter of Prof. Wheelan in which he gives all that I can learn as to the habit of it as distinct from the other, and give you what he says. "The general aspect of the tree in the forest, will not, to my eye, settle the question, (as to its being distinct,) "though my opinion is, that in the open ground the fraseri will be the smaller

two of the two, with darker and closer foliage, and contain the greatest quantity of the Picea balsam, & is the most fragrant."

He certainly failed to distinguish it when he came to collect the maximum cones.

I send you today specimens of the abies from Arizona (probably Bill Williams ~~or San Francisco Mts~~ Mts.) & of all the other pines in Dist. Wheeler's collection. I take them to be —

P. monophylla — Belmont, Nevada
P. edulis, Arizona
P. ponderosa, San Francisco Mts; Arizona
P. Balfouriana, same loc.
P. monticola. same loc.
P. flexilis, Arizona
A. Engelmanni. San Francisco Mts.
A. Douglasii. Arizona
A. grandis, or concolor, or both — or neither — foliage only.

Of these you need return but the specimens of Balfouriana, monticola, and Engelmanni — please send

those back.

Sept 10 '72

They go in two boxes. The long cones of monticola in in one box, the foliage in in the other. The two came together, wrapped in the same paper.

Do not A. Engelmanni a rather shaky species? I am thinking so.

The difference in leaves of fertile and sterile branches of A. grandis &c. I do not believe amounts to anything. The loose, longer, more spreading leaves belong to young trees, or to faster growing down out branches, while ordinarily the mass of the foliage on the tree will be of the close appressed curved character.

I enclose a cactus blossom, sent by Mrs. Thompson from ~~Colorado~~ N. Arizona. She says – "Heads in mass from single base. Eight ribs. Spines verticillate, in clusters of eight. Plant dark, bright-green. March." Can you offer it?

Cereus Engelmanni

I am sorry to say that my experiment with the Yuccas was a failure at last. While most of the flowers treated remained on the branches longer than they otherwise would, yet they all finally fell off. a

considerable number continued on for a week or more, instead of falling as soon as the pericanthe faded, and one which I hoped to save grew for over a fortnight, becoming as large as the end of my finger, but finally it too dropped. Whether it was due to my faulty manipulation or to the very wet season we have had, I do not know.

Mr. and Mrs. Gray reached home last Saturday morning, having apparently enjoyed their trip very much. He brings home some ideas about the western conifers, which he must give you himself.

Yours Very Truly
Sereno Watson

Rec'd Oct 12th

BOTANIC GARDEN, CAMBRIDGE, MASS.

Oct. 8th 1872

Dear Dr. Engelmann

In Lieut. Wheeler's collection is a grape which I had put down to V. vitis-australis. Coming today across your arrangement of the genus in Riley's Report I began to query whether it might not be your V. Arizonica.

It is however not glabrous, though becoming smooth for the species, the raphides of the leaf in as prominent as in St. Louis specimens of australis of your own naming in Herb. Gray, & it matches very

Dr. Gray has not your original article on Vitis in the Trans. St. Louis Academy — so far as I can find.

Have you a copy to spare? or if you think he has it already, just skim in the Trans. is it to be found?

S.W.

with Texan & New Mexican specimens that have been considered v. austrinolin.

However I send you by today with some sp. in it, from which you can decide.

Sent you the other day from Dr. Gray a couple of Russian documents. If you had not them already keep them — otherwise please return. What do you think of the disposition of our Lavia?

Received yours acknowledging receipt of the Arizona conifers & thank you for your notes. The specimens to be returned have not yet come.

Yours very truly
Sereno Watson

Rec'd Nov 4th
Ans — 16th

BOTANIC GARDEN, CAMBRIDGE, MASS.

Oct. 31st 1872

Dr. G. Engelmann

My dear Sir,

Prof. Sargent, who has charge of the newly started Arboretum at the Bussey Institution, and will come for the Botanic Garden here, (to the relief of Dr. Gray,) asks me to write to you in relation to the procuring of a supply of the fruit, or, of washed trees or shrubs for the stocking his nurseries. Can you give

any suggestions as to the most feasible way of getting what he wants.

In the overplus of our greenhouse plants, which he is desirous of getting rid of, is a number of fine specimens of young plants of Livistona Gandichaudii, from the Sandwich Islands. Do you think Thos. Shaw would like one of them?

You referred my "Pinus monticola" of Dougl. Wheeler's collection to P. flexilis. I took it for a facsimile (as nearly as such things

get to be) of specimens collected by Mr. Hall last year in Oregon, as named by Dr. Gray.

Yours very truly
Sereno Watson

Rec'd Dec 10

BOTANIC GARDEN, CAMBRIDGE, MASS.

Dec. 5th 1872

Dear Dr. Engelmann,

The boxes of cones to. were rec'd 3 or 4 days ago — the opuntias pretty well dried, but are now all out & may revive.

I am now that a little closer examination would have set me right as to the long Arizona cone. Yes

fact I called it P. flexilis mysely at first.

I send documents giving account of the Bunny Institt.

We have a good stock of Yucca angustifolia, perfectly hardy but not flowering yet — and a number of other S.W. Yuccas & Agaves started from seed. Also a Dasylirion that appears to be new.

Yours very truly
Sereno Watson

Rec'd March 7
Ans — 9

BOTANIC GARDEN, CAMBRIDGE, MASS.

March 4th 1873

Dr. George Engelmann

My dear Sir,

Dr. Gray has rec'd from Florida a box of Sarracenas, preserved in alcohol, which were originally designed for Dr. Archerson. Can you tell whether he is still in want of them?

Yours very truly
Sereno Watson

P.S. Dr. Gray has rec'd your list of determinations of sundry of Mr. Hall's plants and is much obliged. He is preparing a list of the whole collection.

S.W.

Rec'd March 15th

BOTANIC GARDEN, CAMBRIDGE, MASS.

March 12th 1873

Dear Dr. Engelmann

Your letter to Dr. Gray & myself was at hand this morning. He would write you, but is preparing to leave at once for New York to attend Dr. Torrey's funeral, which takes place tomorrow, at 2 P.M. Our old friend, the friend of Botany and all botanists, is gone. He spoke Thanksgiving day, looking much as usual. Some weeks ago he was attacked with pleurisy, from which

on his California Flora. Have worked up our whole genus of Lupinus and nearly of Potentilla, and will I think publish monographs of them.

Did I not inform you of the loss of the 40th Parl collection? They were boxed up all ready for shipment to their intended destinations, but while waiting Mr. King's approval of the proposed distribution, the building in which it was stored was burned, and all destroyed but the first four sets — which were sent to Eaton, Gray, Torrey, & Washington. — It was a great pity.

Yours very truly

Sereno Watson

Mar 12 '73

he was recovering, but bronchitis (or Sandwichitis) followed under which he sank.

Dr. Gray has advanced sheets of Bentham & Hooker's Genera, 384 pages of the new volume, covering up to 422 out of 766 of the genera of Compositae. The volume will be completed soon.

He is busy as usual — now working out a list of Hall's Texan collection — but in getting tired of these kind of work.

I am deferring my Catalogue at present, after getting just ready to begin the printing it, and am helping Prof. Brown

I send you a Mexican specimen that may be interesting. We have only scraps.

Rec'd Aug 22

BOTANIC GARDEN, CAMBRIDGE, MASS.

Cambridge Aug. 18 1873

Dear Dr. Engelmann

You are the authority on Loranthus — so I come to you to post me up on the Arceuthobia.

Eichler in Flora Brasil says that A. cryptopodum! is the old Viscum vaginatum, HBK! Is he right? —

He also recognizes A. Americanum as distinct, quoting Sp. Hall & Harbour — but still speaks of A. oxycedri as American. What do you

consider as distinguishing the two species beyond the shape of the scales?

Are there not two species confounded in the plates in Hook. Fl. Bor. Am.? A. Americanum and A. cryptopodum (the fruits)? Hooker says that the fruiting specimens were all from Oregon, on P. ponderosa — and I have seen no A. Americanum from so far west. However, in Pl. Lindh. you say "Oregon; on Pinus, Suttall", and of course had Suttall's own specimens. But you say they were only staminate. A specimen here

from Mrs. Durand, ticketed by Suttall "A. americanum, Oregon", is in young fruit and is A. cryptoprodum. The specimens thus giving mixed, perhaps the looking for young ~~fruit~~ may be doubted.

How do you distinguish from A. cryptoprodum your new species A. abietinum? That is all. —

I rec'd your article on Yucca some time ago for which I am much obliged. It is a good thing well done. Will send you a little tract of my own shortly. Yours very truly

Sereno Watson.

Rec Sept. 28th

Portland, Mo.
Aug. 25th/1873

Dr. George Engelmann

My Dear Sir,

I am pleased to hear from Mrs. M. J. Young that she intends calling upon you in St. Louis, and that I have the opportunity of introducing her to your acquaintance. She has been recently appointed State Botanist for Texas and is especially interested in the Cactaceae of that state. She hopes to gain your assistance in their study and I feel great confidence

from my own experience in assuring her of your ready cooperation.

Yours Very Truly
Edward Watson

Rec'd Sept 27
Ans — 29

BOTANIC GARDEN, CAMBRIDGE, MASS.

Sept. 24 1873

Dear Dr. Engelmann,

Yours rec'd, of which I have forwarded to Dr. Gray his portion, with notes from Mr. Thurber himself & Mr. Riley.

I enclose samples of Bigelowia and Wislizenia acanthobrias, and also one that came in yesterday (9 & 8) from the Columbia region.

Brewer to let you know just what he would wish in regard to the Conifers. I supposed he had already corresponded with you upon the subject.

Yours Very Truly

Sereno Watson

Sept 24 '73

Locality of collection not yet reported. apparently on P. ponderosa, judging from bars + stems.

I did not imagine that I had accepted errors in my notes, and was by no means sure of the value of the some of the characters. Though I had done the best with what material I had.

It will probably be a year before the matter will be wanted for the California flora, & I hope then by that time you will be able to give a revision that will be satisfactory.

I will address Prof.