

2000 Riverview Avenue,  
Wilmington, Delaware,  
December 9, 1932.

Dear Mrs. Hall:

Your letter dated Nov. 16 reached me some days ago, and I put it aside until I could devote some time to a careful reply. We ~~had~~ have been away from home for many months, in May, going to England where I read a paper now in process of publication there under a grant from an Oxford University fund; then to France for a time, returning to the States in August but proceeding from the boat to Marthas Vineyard Island, where we spent the remainder of the summer and early autumn with relatives and friends, including Miss Palmer whom you remember. I'm glad your letter came after our return here, for I could not have given it adequate attention elsewhere.

In December, two years ago, you wrote me of Dr. Jepson's intention to publish a biography of your mother and asking me to send you any notes which might be of significance for that purpose. My reply to you was dated Dec. 30, 1930, and enclosed on separate sheet a list of the published references to your mother's botanical work, as far as I was then able to compile such a list. I also stated that I had available for reference here many letters from your mother to Mr. William M. Canby, including long extracts from her journal of daily observations upon Darlingtonia. In reply to mine, I have your letter of Jan. 5, 1931, saying that you were transmitting this information to Dr. Jepson; from whom, however, I have had no request for more detailed information. I think I'd better repeat what I then wrote, with some additions. I hope you will advise me when and where Dr. Jepson's volume is published, for I'll surely wish to procure a copy.

First in regard to any published sketch of your mother's life: you sent me a copy ( which I still have ) of "Flumas National Bulletin", Vol. 53, No. 29, Mch. 27, 1919, which has on its front page a two-column sketch of your mother's life, signed with your initials.

Your mother's letters to Mr. Canby number twenty, and in date extend from Feb. 9, 1875 to Mch. 6, 1877. Some of them are many pages in length\_ five of them more than a thousand words each, one of about three thousand words. As I have said, they give in detail her experiments and observations on Darlingtonia, with occasional reference to other plants. Most of her observations on Darlingtonia seem to have been made without suggestion from others, and most of them were original and first discoveries in regard to that most interesting plant. Recognizing its carnivorous nature, most of her experiments related to its trap structure. She discovered and mapped the distribution of the nectar exudation upon the pitchers, determining that this sometimes took place for two successive seasons upon the same pitcher. She detected the fluid in the bottoms of closedpitchers, hence identifying it as a secretion of the plant; determined that it increased greatly in quantity upon the capture of insect prey, which suggested to her the introduction of nutrient matter ( raw meat, etc. ) into the pitchers, and she recorded the surprising response in the pouring out by the leaf of a great quantity of fluid. She concluded that the nectar bait had no stupifying qualities, and that the pitcher-fluid has no digestive power, but that decomposition rather than digestion takes place in the pitchers. By necessarily crude experiments, she determined that under some circumstances, absorption takes place in the pitcher cavity. By sitting among the plants through the rare event of a summer thunder-shower, she confirmed her belief that the entrance of rain-water is precluded by the pitcher structure. She was highly elated by the discovery that the age of an individual plant may be determined, by counting the leaf-bases attached to the rhizome. She made prolonged observations upon the pollenizing insects; and especially upon the dipterous larvae which inhabit the pitchers, feeding upon the captured insects. Her observations began before she had any literature whatever in regard to

insectivorous plants; and not until 1875 did she have even a hand lens, her letter of March 22 of that year requesting that Mr. Canby send her one. On Drosera too she made interesting original observations, and in one of her letters I find the statement that "My notes on Drosera rotundifolia were published in our county paper". This was in 1875 or earlier, and I think it should be looked up, if a file is available. You gave me a lead-pencil note of her observations upon this plant, which includes one curious motion of the leaf which, Dr. Macfarlane tells me, has been recorded for Dionaea but never for Drosera.

Finally, in regard to published references to your mother's botanical work: none of these are very lengthy, and those I will now quote are not arranged chronologically, but as I put my hands upon them.

Asa Gray, in his collection of published essays, "Darwiniana" (Appleton & Co., New York, 1876) page 330, in a brief paragraph gives your mother credit for having made "the principal observations upon this pitcher-plant\*\*\* only some of the earlier ones have thus far been published by Mr. Canby". I believe that this essay was first published in the "Nation", Jan. 1876, but I have not seen it there and do not know whether it is exactly reproduced in the published volume quoted above.

Also Dr. Gray published a letter from Mrs. Austin in "American Naturalist", almost certainly between 1875 and 1877; this I have not looked up, but it should be easily found.

There is a reference in "Botanical Gazette", III, pgs. 70, 71, 91, of the existence of which I have memo., but not at the moment available.

Mary E. Pulsifer Ames, "The California Horticulturist and Floral Magazine", X, No. 8, August, 1880, pages 225-229, tells of a visit to your mother at Butterfly Valley, and of your mother's demonstration of the response of the pitchers to the introduction of nutrient matter.

F. Kurtz, "Zur Kenntniss der *Darlingtonia californica*, Verhandlungen des Botanischen Vereins der Provinz Brandenburg, Bd. XX, 1878, reprint

or separate paged I-XXIV, makes several references to your mother, quoting briefly from her letters and mentioning a published reference by Dr. Keck, another of her correspondents. This may be found, I believe, in "E. Keck, Oesterreiche Botanische Zeitschrift, XXVI, 170-171, 1876.

J. G. Lemmon published a number of popular articles on Darlingtonia, probably many more than I have found, for they appeared in all sorts of places. At least the first of these I mention below contain references to your mother:

Mining and Scientific Press, San Francisco, XXXII, No. 18, Apr. 29, 1876  
Pacific Rural Press ? " XV, Mch. 23, 178, 1878  
Weekly Press, Santa Barbara, IX, June 15, 1878.

Jointly with others, I have made reference to your mother's work, as follows: Journal Franklin Institute, Philadelphia, Vol. 189, pgs. 178, 1920, and Transactions Wagner Free Institute of Science, Philadelphia, pgs. 5 and 39, 1927. I sent you copies of both of these papers. In verbal communications to various scientific gatherings I have frequently told the story of your mother's long study of Darlingtonia, under such difficult external conditions, and I had hoped before this to have seen that account in print, for the permanent record it so fully deserves.

I wish I might follow your suggestion of another visit to California. We have never had a more interesting summer, than the one we spent at Keddie. However, I see no present prospect for another western trip. I hope we may hear from you from time to time; and we'll be especially interested to learn of your experiences in that beautiful region where we met in 1918. With sincere regards from us both,

Yours very truly,

Memorandum of references to the botanical observations of Mrs. Austin, probably far from complete ( F. M. J., 1930 ).

✓ Asa Gray, Darwiniana, ( Appleton, N. Y. ), p. 330, 1876.

✓ Keck, Oesterr. bot. Zeitschr.. p. 170-171, 1876.

✓ Lemmon, Mining and Scientific Press, San Francisco, Vol. XXXII, No. 18, Apr. 29, 1876.

✓ ? American Naturalist, probably 187?, reference not at moment available, but a letter from Mrs. Austin to Asa Gray, printed by his permission.

✓ Botanical Gazette, III, pgs. 70, 71, 91 ( not at moment available )

✓ Kurtz, Zur Kenntniss der Darlingtonia californica, in Verhandlungen des botanischen vereins der Provinz Brandenburg, XX, pgs. ~~XXX~~ iii-xxiii. , 1878.

✓ Ames, in California Horticulturist and Floral Magazine, San Francisco, X. 225-229, 1880.

Hepburn, St. John & Jones, Journal Franklin Institute, vol. 189, p. 178, 1920.

Hepburn, St. John & Jones, Trans? Wagner Free Institute of Science, Phila., XI, pgs. 5 and 39, 1927.

Letters by Mrs. Austin to William M. Canby, Wilmington, Delaware, Feb. 9, 1875 to Mch<sup>7</sup>. 6, 1877, with extensive extracts from her journal, about fifty typed pages in the possession of F. M. J., originals mounted in a book for the Society of Natural History of Delaware, at present in the custody of Mrs. H. M. Canby.

Biographical Sketch of Mrs. R. M. Austin, in Flumas National-Bulletin, Quincy, March 27, 1919, returned herewith to Mrs. Hail.

References quoted above should be confirmed for accuracy, before publication\_ FMJ.

*Lemmon - Santa Barbara Weekly Press June 15, 1875 IX No 51*