

November 9, 1853

to cause the slightest shade of doubt to arise, as to the mutual regard which exists between us. I have just read over our first correspondence³ and in doing so I have felt that under Providence you had exercised an important influence over the whole course of my life ↑and↓ I should deem myself unworthy of self respect could I do any thing to militate against your best interest.

I shall endeavour to stop a night at Princeton on my return from Albany ~~from Albany~~ and will then have a conversation with you on the subject of the College.

I would gladly return to Princeton and assist you in developing all the advantages it possesses as a place of education but I do not at present see any prospect of being able to leave the position I now occupy.

I remain very truly
your friend
Joseph Henry

Dr John Maclean

Letters, Maclean Papers, Princeton University Archives, Seeley G. Mudd Manuscript Library, Department of Rare Books and Special Collections, Princeton University Library.

1. Doc. 284.

2. Doc. 283.

3. Between June and September 1832. *Henry Papers*, I:433-437, 439-440, 441, 443, 458-459.

293. TO J. H. LEFROY

Smithsonian Institution.

Washington. D.C. Nov 9. 1853

My Dear Sir,

It is a long time since I have had the pleasure of hearing from you,¹ but this I know is in a great measure my own fault, for correspondence cannot be expected to be continued entirely on one side. The truth is that during the last two years I have had more business on hand than without considerable assistance I could attend to.

I now write to request information as to the state of your memoir on the Aurora-borealis.² The proposition if I recollect rightly was made to publish it in parts. When may we expect to receive the first part? Do you wish us to forward to you the observations which have been collected during the present year? We could also procure from Lieut. Maury a series of notices on the appearance of the meteor on ship-board and I find we have a copy of the auroral observations made by Lieut. DeHaven during the American Arctic expedition which we can forward to you.

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I am much pleased with the questions which you propose to endeavor to answer, viz. (1st.) Does aurora ever occur in low latitudes when it is wanting in higher ones? (2nd.) Is it developed in continuous zones, or are there wide gaps in these zones, if the latter, (3d,) have they any connection with other atmospheric phenomena, (4th) what are the ordinary diurnal laws of its developement, (5th) Can the facts be reconciled with any theory giving it a material objective existence, or is it an optical phenomenon as Mr Brown asserts, (6th) Can the facts be reconciled with any zodiacal theory. (7th) What are its geographical limits, and what causes their singular variation from day to day, (8th) Are lines of equal frequency on the globe or equal intensity, circles at all.

With reference to these questions, I think it probable the aurora may appear in a Southern Latitude when it is wanting at the same moment of time in a Northern, though not wanting during the whole evening. I also think it probable that it does not form a continuous zone, but that there are gaps which may depend on the direction of the wind or the state of the hygrometer. I do not at present see any a priori reason for supposing the aurora to be governed by the position of the sun, and yet the observations would seem to establish a diurnal period. I cannot entertain for a moment the idea that the phenomenon is an optical one, and I think there can be little doubt of its being electrical, and this supposition I consider confirmed by the induced currents which have been observed in lines of telegraph extending North and South, during the shooting up of the bright auroral beams.

I have long suspected that there might be a connection between the aurora and violent storms near the equator. There is also a connection between the aurora and the phenomenon of shooting stars. Several independent observers have recorded facts bearing on this point, and I have directed the attention on several occasions, of our observers to it.

I regret very much that we were unable to carry out the plan of establishing observations in the British possessions in North America. I happened to be absent when your telegraphic dispatch³ arrived giving the decision of the Hudson's Bay Company that they could not furnish instruments. I regret that on account of want of funds we are obliged to defer the execution of this plan for the present. The enterprise however must be renewed and I have no doubt it will eventually be successful.

During the present year all the means which the Smithsonian Institution could devote to Meteorology have been expended in collecting all the meteorological data to be found in the United States and in reducing and preparing these for publication, and in order to save expense the results were appended to the Regents report to Congress. The

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whole was ordered to be printed without a very critical examination. They will form a quarto volume of five or six hundred pages, and include observations made at about 600 stations and I trust will be of value in correcting the Isothermal lines of Dove's charts as well as in affording interesting deductions as to the climate of the several parts of the United States.⁴

It is true the instruments are not as reliable as could be wished, yet the errors in different parts of the scale serve to compensate each other, and by comparing observations with each other which are made near the same locality, the degree of reliability may be ascertained. As soon as this volume is printed, I will send you a copy of it.

The building for the Magnetic Observatory has been finished, on the grounds of the Smithsonian Institution, and the observations will be commenced as soon as certain deficiencies in the apparatus can be supplied.

We have imported several sets of instruments for the use of exploring parties sent out by Government, and in course of time I trust we will be able to exhibit the several lines of magnetic force over the North American continent. There is a large amount of records of observations on the variation of the needle made by the United States surveyors in the process of establishing the township lines. The observations were made by an instrument called the solar compass which gives the direction of the magnetic meridian within a few minutes of the truth.⁵

The present Secretary of the Interior⁶ will afford the Smithsonian Institution every facility for collecting the facts relative to this point and we shall endeavor during the next year to put the matter in train of investigation.

I am happy to inform you that all the affairs of the Institution are still in a prosperous condition and our only cause of regret is that so much of the money should be expended in the building and collections. There is however some prospect that the Government will purchase the building for the purpose of a National Museum and if this proposition can be carried into effect, we shall be able to do twice as much as we are now doing for science.

I remain, very respectfully

Your obedt serv't

Joseph Henry

Sec^r S.I.

Capt. J. H. Lefroy.

Woolwich.

England.

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"Auroras," Miscellaneous Meteorological Material, Smithsonian Meteorological Project, Records of the Weather Bureau, RG 27, National Archives.

In William Jones Rhee's hand, with signature and title in Henry's hand. Reply not found but dated December 16 according to a file note.

1. The last letter we have found is Lefroy to Henry, November 5, 1850, Letters Received, Records of the Smithsonian Meteorological Project, Records of the Weather Bureau, RG 27, National Archives.

2. Utilizing data gathered by army officers and employees of the Hudson's Bay Company in Canada and by Smithsonian observers in the United States, Lefroy had intended to publish a memoir on auroral observations in North America. This data included descriptions of auroras, notations of "no aurora," comments on wind and cloud conditions, and a record of the time of observation. Delayed due to Lefroy's transfer to Woolwich and his military obligations, the memoir was never published. S. M. Silverman, "Joseph Henry and John Henry Lefroy: A Common 19th Century Vision of Auroral Research," *Eos*, 1989, 70:233-234, 237.

3. Not found.

4. In the *Smithsonian Report for 1853*, p. 22, Henry reported that after Congress ordered that the reductions be printed, it was found that they could not be accommodated in octavo form but would require the larger and more costly quarto form. This would require a special resolution of the Senate. The data were never published.

5. The solar compass was used by General Land Office surveyors in the field. *Henry Papers*, 7:81n, 84.

6. Robert McClelland (1807-1880) was governor of Michigan from 1851 until his appointment as secretary of the interior in 1853. *DAB*.

294. FROM JOHN MACLEAN AND MATTHEW BOYD HOPE¹

College of New Jersey
Princeton. Nov. 10th 1853.

Dear Sir,

You cannot but be aware of the earnest desire entertained by all the friends of the College, that you should return to Princeton, and again take an active part in the instruction of the youth here: and that there is nothing, which the Trustees and other friends of the College can do to secure so important a measure, that they would not do.—Although not authorized to speak for the Trustees, yet knowing their mind in regard to the object which we seek to obtain, we wish to submit to you a proposal, which we fully believe to be practicable; if we can but get your consent: and this consent we do earnestly hope you will give. The proposal is as follows, viz.

That we shall undertake to raise from the friends of the College the sum of fifty thousand dollars, the money to be invested at the discretion of the Trustees; the interest to be paid to you; and the payments to begin from the time you enter upon your duties here: and in case Mrs Henry should survive you, she shall receive ↑annually↓ the interest of fifteen thousand dollars during her life: and in any case your family shall receive the interest of last named sum, for the period of ten years, whether Mrs Henry should survive you that long or not—