

1751 Eighteenth Street Washington. D. C. Nov. 17th

My Dear Sir:-

In reply to your favor, please let me say that the paper sent to you was written nearly a year ago in accordance with a request of a one or two gentlemen. Since then I have carried my researches a great deal farther. I enclose you an abstract of Niagara falls, and hope to send you the full paper shortly. At the time the paper was written, I wished to avoid the controversial question of Glacial dams. On that point I have ^{now} fully made up my mind that they did not exist for the facts in the Adirondacks and lately discovered data in the New England mountains disprove the possibility of such. Therefore I can answer your question with greater degree of certainty. If you regard the commencement of the so-called lake epoch as the end of the ice age proper, then it ended from 48,000 to 60,000 years ago. If the differential movements were uniform from the first then you would have to take the shorter period, but there is evidence that the movements were slower at first than later, and accordingly I have given this latitude. But I hardly regard the lake epoch as the end of the ice age, for the old till was greatly ^{eroded} eroded before the beach epoch, and consequently the end of the till ^{making} epoch was somewhat earlier.

I had intended to have written to you after my papers in the press were out. My work in the West Indies and adjacent portions of the southern states has been extremely fruitful. We have been trying to read the Pleistocene phenomena of the north without considering the synchronous conditions of the tropical regions, and in the latter region the key of the earthmovements of thousands of feet in both directions are recorded, and these extended to the north. Owing to the intervening episodes of erosion during the Pleistocene period ^{were produced} structures ~~some~~ which have given rise to great confusion. Again the movements have been unequal. It is only recently that I have been able to define what the Champlain clays are in their relation to the physical geography of the past. But on this subject I have not written a line. I have found that in New England ~~the~~ the recent or late Pleistocene submergence was not more than 2,000 feet, thus leaving only a few small islands. This depression is ^s measurable and not a surmise. To the amount that I mention, the submergence has been since the birth of Niagara. But please do not suppose that I mean that the coast of New England was depressed to that amount. From the data in the south and in Cuba and in ^{as well as the Adirondacks etc} Jamaica, I find that the central portion of the mountain masses have moved since the pleistocene times more than the plains in front of them. I should like to discuss this West Indian problem with you but it is entirely too long to touch in a letter until after you

^{have} seen the paper. And I trust that it is not unworthy of your old pupil. I enclose a short review of McGee's Lafayette, which I hope ~~that~~ you will read. When his work is carried to its conclusion, it will be one of the most important contributions to physical and superficial geology. It is emphasized by my work in Cuba, and I go farther, in the problem of the building of the continent.

I hope that your health is better than when I last saw you. As soon as I get my forthcoming papers I shall send them to you, and hope that you will give me your impression of them. I want to go again to the West Indies, but cannot say yet whether I shall go this winter or not. I am here to give a few popular lectures, as you will see by the enclosed card.

I am
Yours faithfully,
J. W. Spencer.

Spencer
Nov 9/94

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