

DISCOVERY OF LETTERS BY LYELL AND DARWIN

HENRY P. ZUIDEMA
University of Michigan

ABSTRACT

Original letters written by Sir Charles Lyell to the Rev. Charles Kingsley and the Rev. John Pye Smith and also a letter from Charles Darwin to James Croll on alternate glaciation of northern and southern hemispheres were found recently between the pages of the first edition (Vol. III) of Lyell's *Principles of Geology*. The Lyell letters do not appear in previously published biographical material on Lyell. In his letter to Kingsley, Lyell expresses his interest in the exploration of the Green and Colorado rivers by John Wesley Powell. To Dr. Smith he reveals his belief that the waves of immigration of Europeans into the United States in the 1840's, "like the irruptions of the Goths & Vandals, are doing their utmost to overwhelm the indigenous civilization, but against which a noble stand is making."

While reading Volume III of the first edition of the *Principles of Geology* by Charles Lyell¹ recently, the writer was agreeably surprised to discover two original letters written by Lyell and, on further examination of the book, a letter sent by Charles Darwin to James Croll on November 24, 1868, on the subject of alternate glaciation in the northern and southern hemispheres. The letters, loosely placed between the pages of the *Principles*, are in excellent condition. The Detroit bookseller from whom the writer purchased the book, with the companion volumes, was unable to provide any clue to their previous ownership, and the writer has no pertinent information which would permit tracing the letters along their evidently devious travels.

The Lyell letters are to the Rev. Charles Kingsley, written April 26, 1871, and to the Rev. John Pye Smith (June 2, 1849). From an examination of the known Lyell correspondence, these appear to be heretofore unpublished letters. The letter from Darwin to Croll evidently was written by Mrs. Darwin but is signed by Darwin and is mentioned in the two-volume compilation, *More Letters of Charles Darwin*.²

Few records of Lyell's activity during

¹ *Principles of Geology* (3 vols.; London: John Murray, 1830-33).

the six years prior to his death in 1875 are preserved, but these few show that the great uniformitarian retained his keen interest in geology to the end and showed no evidence of declining mental strength.

The note to Kingsley is on stationery bearing the Lyell address, 73 Harley Street, London W, embossed in blue, and was written four years before Lyell's death, as he was revising his tenth edition of the *Principles*. The letter reads as follows:

MY DEAR KINGSLEY

On my return from a geological Easter tour to Devon and Cornwall, I find your very kind note & very curious & instructive (?) Report by Major Powell on the cañons of the Rio Colorado. I must read it again when the work is out as I cannot yet fully understand the country. The *chines* as they call them in Hants near Xchurch & Bournemouth are I suppose diminutive cañons.

I hope soon to hear an account of yourself and family.

My wife desires her kindest remembrances & believe me

Ever most truly ys

CHA LYELL

"The 'chines' of Hants (Hampshire) and the Isle of Wight are, in the words of Horace B. Woodward, "gullies which

² *More Letters of Charles Darwin*, ed. Francis Darwin and A. C. Seward (London: John Murray, 1903).

73. Harley St
London. W.

April 26
1871

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fully understand the
country. The chines
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in plants near
X. I think I should
write on 10th

you describe canons
I hope soon to
hear on account
of yourself I find
myself desirous
to know more
before I believe
on nothing
Yours
Ch Lyell

have been formed by the action of springs in making their way over the cliffs into the sea."³

Lyell's excursions frequently took him to the coast in the Christchurch-Bournemouth area, where the Eocene strata have been deeply incised.

When the letter was written, Major Powell was at Green River, Wyoming, preparing for his second trip down the Green and the Colorado and had probably already made his observation that "the Uintas rose no faster than the Green could erode."

The energetic and versatile Powell, who had lost part of an arm at Shiloh and had collected fossils while his men dug trenches before Vicksburg, now was destined to write one of the most dramatic chapters in American geology. He could not have known that the vast canyons of the Southwest were being compared across the Atlantic to "the chines in Hants" or that Lyell, the master whose ideas Powell had championed in America in the face of stubborn opposition, was eagerly awaiting publication of Powell's papers, "the better to understand the country."

The four tours of Lyell in the United States three decades earlier had taken him only to the Mississippi. We can only wonder what impetus he might have given to the development of American geology, had circumstances permitted him to travel into the then still untamed West.

Kingsley, canon of Chester, sociologist, and geologist, is better known as the author of *Westward Ho!* and *The Water Babies*. He also wrote *Town Geology*, an introduction to geology for the people of Chester. He met Darwin in 1854, at the Linnaean Society and recalled Darwin as "a quiet, meek man, very anxious to

know whether I really 'denied the atonement,' on which point, I think, I satisfied him."

Lyell met Kingsley in 1860, the year in which the exuberant Huxley, slapping the knees of a friend next to him and uttering, "The Lord hath delivered him into my hands," launched into his reply to the Bishop of Oxford, who was at the time attacking Darwin's newly published *Origin of Species*.

Darwin, Lyell, and Kingsley kept up a sprightly correspondence through the years, and the influence of the great naturalists on the theologian-geologist is apparent in Kingsley's letter to a friend, the Rev. F. D. Maurice, in 1863:

I am very busy working out points of Natural Theology, by the strange light of Huxley, Darwin and Lyell. The state of the scientific mind is most curious; Darwin is conquering everywhere, and rushing in like a flood, by the mere force of truth and fact. The one or two who hold out are forced to try all sorts of subterfuges as to fact, or else by evoking the *odium theologicum*.

The four visits of Lyell to the United States were made during a great tide of immigration, such as the country had never seen before. In 1844 alone, 297,000 European emigrants came to America. In 1845, during his second visit, 114,000 were admitted. The Irish famine brought another deluge of newcomers in the succeeding years, and by 1850 the total population was in excess of 23,000,000.

What he saw in Boston, in New York, and in the rude hinterland and the babble of foreign tongues that he heard caused Lyell much concern, as witness his letter to Dr. Pye Smith in 1849, following his return to England:

MY DEAR SIR

I have given orders to my publisher to send a copy of my book to Jackson & Wolfe 18 St. Paul's Ch y'd, of which I beg your acceptance. It is entitled a Second Visit to the United States & I hope that none of my allusions in the 11th

³ *Geology of England and Wales* (London: Longmans, Green & Co., 1876).

and 12 Chapters v. 1. to the Congregational or Independent Churches are offensive to your views in reference to the bearing of the organization of such churches on the educational movement now in progress in those parts of the Union which are least kept back by emigration from Europe which like the irruptions of the Goths & Vandals are doing their utmost to overwhelm the indigenous civilization but against which a noble stand is making.

Believe me

Sincerely yours

CHA LYELL

Dr. Pye Smith

The Rev. John Pye Smith (1774-1851) was pastor for forty-three years of the (Independent) Gravel Pits Chapel at Homerton, a Fellow of the Royal Society, and author of *The Mosaic Account of the Creation and the Deluge Illustrated by the Discoveries of Modern Science* (1837) and *Scripture and Geology* (1839).

The library of Dr. Smith no doubt already held a copy of Lyell's *Travels in North America, with Geological Observations on the United States, Canada and Nova Scotia*,⁴ the nongeologic chapters therein containing this paragraph:

The state of Ohio has always punctually discharged the interest of her debt by direct taxes imposed for that special purpose, although there has been a deficit from the beginning on the proceeds of her public works. She is of recent origin, and her growth has been more rank and luxuriant than that of any other State of the Union. An influx of illiterate Irish, Welsh and Westphalian settlers, has tended to lower the educational qualifications of her electors, considered as a whole; but she came of a good New-England stock, which, like the philosopher's stone, has converted much of baser metal into gold.

Now, four years after the appearance of this volume, Dr. Pye Smith, upon receiving his complimentary copy of *Second Visit to the United States*, found additional fears concerning the future of the Union in Lyell's description of a "repeal meeting" in Boston, where "an orator with an Irish accent, addressed the

crowd on the sufferings of the Irish people precisely as if he had forgotten on which side of the Atlantic he then was!"

The Darwin letter of 1868 to James Croll, one of the documents found between the pages of my copy of Lyell's *Principles*, is as follows:

DEAR SIR

I have read with the greatest interest the last paper which you have kindly sent me. If we are to admit that all the scored rocks throughout the more level parts of the United States result from true glacier action it is a most wonderful conclusion & you certainly make out a very strong case; so I suppose I must give up one more cherished belief. But my object in writing is to trespass on your kindness & ask a question, which I dare say I c'd answer for myself by reading more carefully, as I hope hereafter to do, all your papers; but I shall feel much more confidence in a brief reply from you.

Am I right in supposing that you believe that the glacial periods have always occurred alternately in the northern and southern hemispheres; so that the erratic deposits which I have described in the S. parts of America & the glacial work in New Zealand c'd not have been simultaneous with our glacial period. From the glacial deposits occurring all round the Northern hemisphere & from such deposits appearing in S. America to be as recent as in the North, & lastly, from there being some evidence of the lower descent of glaciers all along the Cordillera, I inferred that the whole world was at this period cooler. It did not appear to me justifiable without distinct evidence to suppose that the N. and S. glacial deposits belonged to distinct epochs; tho' it wd have been an immense relief to my mind if I cd have assumed that this had been the case.

Secondly, do you believe that during the glacial period in one hemisphere, the opposite hemisphere actually becomes warmer, or does it merely retain the same temperature as before?

I do not ask these questions out of mere curiosity, but I have to prepare a new ed. of my *Origin of Species*, & am anxious to say a few words on this subject on yr authority. I hope you will excuse my troubling you.

Pray believe me

Very faithfully yours

(Sgd.) CHARLES DARWIN

Darwin was seeking an explanation for the observed distribution of plants

⁴ 2 vols.; London: John Murray, 1845.

11 Harley St
June 2^d / 49

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Wm Lyell

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Dir. Albany
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and animals and was turning more and more to the astronomical theory of Croll (1821-90), the Scottish geologist and climatologist, and away from the opinion of his old friend, Lyell, who consistently maintained that geographical changes are the principal, and not the subsidiary, causes of glaciation.

A zealous disciple of Lyell ever since he had first read Lyell's *Principles* as a youth while on the epochal cruise of the "Beagle," Darwin now chose to differ from Lyell regarding the validity of Croll's views. In 1866, two years before the letter to Croll was written, Lyell wrote to Darwin as follows:

I have been doing my best to do justice to the astronomical causes of former changes of climate, as I think you will see in my new edition [the tenth, first vol. published in November, 1866, the second in 1868] but I am more than ever convinced that the geographical changes are, as I have always maintained, the principal and not the subsidiary ones. . . . In my winter of the great year, I gave you in 1830 cold enough to annihilate every living thing. The ice now prevailing at both poles is owing to an abnormal excess of land, as I shall show by calculation. Variations in eccentricity [of the orbit] have no doubt intensified the cold when certain geographical combinations favored them, but only in exceptional cases, such as ought to have occurred very rarely, as paleontology proves to be the case.

Ever most truly yours,

CHARLES LYELL

For Darwin, however, the Croll theory gained in appeal, and his letter to Croll followed. This letter was followed by another from Darwin, a few months later, in which Darwin wrote Croll:

Sir C. Lyell, who is staying here, is very unwilling to admit the greater warmth of the S. hemisphere during the Glacial period in the N; but, as I have told him, this conclusion which you have arrived at from physical considerations, explains so well whole classes of facts in distribution, that I must joyfully accept it; indeed, I go so far as to think that your conclusion is strengthened by the facts of distribution. . . .

In 1872, Darwin, in his sixth edition of the *Origin of Species*, abandoned his cautiously worded statement of earlier editions, in which he indicated belief in a world entirely colder during glacial times. He now gave considerable space to Croll's ideas, adding that "this [Croll's] conclusion throws so much light on geographical distribution [of animals and plants] that I am strongly inclined to trust it. . . ."

In the same year there appeared Lyell's eleventh edition of the *Principles of Geology*, revised, and Lyell stands firm, stating:

Mr. Darwin in the last edition of his *Origin of Species* has inclined toward adopting Mr. Croll's theory of alternate glaciation and perpetual spring in the opposite hemispheres, on the ground that it would account for some of the anomalies in the distribution of animals and plants, by affording a refuge for tropical life during a period of extreme cold.

But . . . until we know what climate the countries now inhabited by tropical animals and plants were enjoying in glacial times it is premature to contend with imaginary difficulties as to the survival of forms which would have been extinguished if the snow and ice had been universal down to Lat. 55, even over one hemisphere at a time.

Today, after seventy-five years of research and speculation, Lyell's view of the problem still agrees with that of leading students of the Pleistocene, a tribute to the sagacity of the man to whom Darwin dedicated the second edition of his journal⁵ of the voyage of "H.M.S. Beagle" with his acknowledgment that "the chief part of whatever scientific merit this journal and the other works of the author may possess, has been derived from studying the well-known and admirable *Principles of Geology*."

⁵ Charles Darwin: *Journal of Researches into the Natural History and Geology of the Countries Visited during the Voyage of H.M.S. Beagle Round the World* (London: John Murray, 1852).