

no doubt that the southern coast of Florida affords exceptional advantages for the successful study of the formation of coral reefs.

JOSEPH LECONTE

Berkeley, California, September 18.

Geological Climates

THE dilemma into which Dr. Houghton thrusts the rigid uniformitarian school is one which was enlarged upon some years since, when reef-building corals were asserted, upon the evidence afforded by fossils, to have existed during the Miocene and Oligocene ages in seas where Tasmania now exists in the south and Hampshire in the north. There are no instances of large masses of reef-building corals in corresponding latitudes at the present day, and the range of these surface-living, high-temperature-requiring zoophytes is well known.

Uniformitarians may take comfort, however, and slip under the horns which Dr. Houghton so ably presents for their transfixment. Where I now write, on the Bagshot sands and gravels of Cooper's Hill, facing the cold north with a touch of the east, there is a patch of bamboo canes in full leaf. They were in full leaf at this time last year. The plant survived out of doors the extreme frost and fogs of last winter and other evidences of a temperate climate, and it has been in beautiful leaf all this summer.

Now everybody knows that in torrid India the bamboo grows. Therefore if the palæontologist of the year A.D. 18800 should dig up the Cooper's Hill stalks and leaves, and should have the opportunity of examining in some future Kew the bamboos of the hot parts of the earth, he would logically, geologically, palæontologically, but somehow unreasonably, come to the conclusion that Cooper's Hill and India enjoyed corresponding and intensely tropical climates in 1880, during the geological age when the earth's polar axis was certainly inclined nearly $23\frac{1}{2}^\circ$ to the plane of the ecliptic.

P. MARTIN DUNCAN

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The Yang-tse, the Yellow River, and the Pei-ho

I HAVE been much interested in the paper on the above rivers, published in NATURE, vol. xxii, p. 486. To the extent of the writer's personal observations the calculations appear to have been careful and accurate, and as near the truth as the observations of a single year are likely to be. A reference to Sir Charles Hartley's observations of the Danube, extending over ten years, shows that the mean maximum discharge of that river for one year exceeded the minimum by 3 to 1.

It is however to the use of *one* observation of the Yellow River made in 1792 by Sir Geo. Staunton that I feel compelled to enter a protest, firstly, because *one* observation is misleading in drawing general inferences, and, secondly, is especially to be suspected when it is at variance with other well authenticated examples.

According to the writer of the paper, the mean discharge of the Yang-tse is 770,397 cubic feet per second, carrying to the sea 6,428,800,000 cubic feet of sediment per year, but the Yellow River having only a mean discharge of 116,000 cubic feet per second delivers, according to Sir George Staunton, 17,520,000,000 cubic feet of sediment per year into the Gulf of Pe-Chili. With Dominie Sampson we may well exclaim "prodigious!" It has struck me as an explanation of this anomaly that Sir George Staunton probably measured the deposit from "the gallon and three quarters" of the Yellow River water as *wet mud*.

If so this will at once account for the excessive amount of it. The deposit of Nile mud in the reservoirs of the Cairo water-works often amounts to 1 inch in 10 feet of water,¹ or $\frac{1}{10}$ part of the bulk. Dr. Letheby's analyses show that in August the proportion by weight of sediment (dried) being the maximum of the year, in Nile water is $\frac{1}{175}$ ²; thus taking the specific gravity of the dry mud at 1.9, the measurement of the wet deposit by bulk exceeds the dry about 10 $\frac{1}{2}$ times.

If the 80 grains to the pint of the Yellow River water be divided by 10 $\frac{1}{2}$, we arrive at between 7 and 8 grains per pint of dry sediment, corresponding closely with the proportion given by the writer for the Pei-ho and Yang-tse.

I would also point out that the discharge of the River Plate as given in the table is not the *mean*, which has not yet been

¹ "Mediterranean Deltas," *Edin. Review*, January, 1877.

² "Egyptian Irrigation," Second Report, January, 1876. By John Fowler, engineer to the Khedive.

ascertained, but the *dry weather flow*.¹ Still another little error, for which the writer is in no way responsible, being a quotation from Huxley's "Physiography." The discharge of sediment by the Thames is a calculation by Prof. Geikie on an *hypothesis*, not on observation; and instead of 1,865,000 should be 18,650,000—this printer's error has been copied from Geikie's original paper by writer after writer without discovery.

I should feel obliged if the writer would explain why the surface-current of the Yang-tse and Pei-ho should vary so in velocity with the same average depth of water. It seems anomalous.

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Miller's Elements of Chemistry—Part III. Organic Chemistry

IN his notice of the new edition of this work, by Mr. Groves and myself, which appears in NATURE, vol. xxii, p. 530, Mr. Muir refers to an obvious omission at p. 933. May I request those who possess the book to insert at the top of the page the words "Probably, however, the most weighty objection that can be raised to the" . . . Although in the revise, by some strange mischance this line has been dropped in printing off.

HENRY E. ARMSTRONG

Swiss Châlets

IDENTICAL suggestions to those of Mr. George Henslow with regard to the connection in descent of modern Swiss châlets with ancient pile lake-dwellings will be found expressed in Dr. J. J. Wild's "At Anchor" (Marcus Ward and Co.), p. 106, and with some detail in my "Notes by a Naturalist on the *Challenger*" (Macmillan and Co.), p. 399. Dr. Wild, who is a native of Switzerland, and I arrived at the same conclusions independently, as we only found out on reading one another's books, from the study of the modern pile dwellings of the Malay Archipelago during the voyage of the *Challenger*, and we both amongst other conclusions identified the balcony of the châlet with the ancient platform, as does Mr. Henslow.

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Spectre of the Brocken at Home

HAVING occasion ten days ago to go into my garden about half past ten o'clock at night I found there was a thick white fog, through which, however, a star could be seen here and there. I had an ordinary bedroom candlestick in my hand with the candle lighted, in order to find the object I wanted. To my great surprise I found that the lighted candle projected a fantastic image of myself on the fog, the shadow being about twelve feet high, and of an oddly distorted character, just as the spectre of the Brocken is said to be. It is of course usual on going into the open air to use a lantern with a solid back for any light that may be wanted, and with this, of course, such a shadow would not be seen; but in this charmingly foggy valley of the Thames, and in these days of "Physics without Apparatus," the effect I saw can probably be seen only too often. May not the gigantic spirits of the Ossianic heroes, whose form is composed of mist, through which the stars can be seen, be derived from the fantastic images thrown upon the mountain fogs from the camp fires of the ancient Gaels? In a land where mists abound a superstitious people might very readily come to consider a mocking cloud-spectre to be supernatural, though it was really their own image magnified. If it be true that in our earlier stages of development we resemble more nearly the past forms of life and thought, I may mention in this connection that, thinking to amuse a little child of three, I threw a magnified shadow of her on the wall with a candle, and then, by moving it in the usual way, made the figure suddenly small. Instead of the changing shadow giving the pleasure intended, the child was terrified, as the warriors of Morven may have been when they saw their shadows on the clouds.

J. INNES ROGERS

Putney, October 8

Ice under Pressure

THERE is a point in Dr. Carnelley's letter (NATURE, vol. xxii, p. 435) which I have been hoping to see cleared up by subsequent letters. He says, "In order to convert a solid into a

¹ Report by James Eateman, C.E.