

LETTERS TO THE EDITOR

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[The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to insure the appearance even of communications containing interesting and novel facts.]

Geology of the Malayan Peninsula

IN some geological excursions made recently in the State of Perak, I met with some curious facts which may be of interest to many of your readers. I made boat journeys down the Perak River from Enggor to the mouth, then back again up the valley of the Kiuta, and then returning to the mouth of the Kampar, went up that stream as far as boats can go. The main chains dividing these ranges are all granitic, rising to peaks generally over 3000 but sometimes over 7500 feet high. The ranges are flanked by Lower Limestone ridges, forming detached hills about 1500 feet in elevation. The summits of these hills, as well as on the flanks, are pierced with caves, which contain a ferruginous clay with stream tin. The latter is evidently derived from granite, but as the limestone hills are quite isolated, and some miles away from the source of the ore, the denudation of the country must have been very great. Some of the caves with tin sand are 1000 feet above the plain, and have to be approached by steps cut in the face of a precipice. These small mines are rich enough to attract a few Malays and Chinese, who are the only inhabitants. The country is otherwise a dense jungle. The limestone is crystalline, without a trace of organicism, though lines of stratification can still be traced. Tin is also found in the drift at the base of these hills, entangled as it is in the pinnacles and peaks of the underlying limestone.

There is evidence of extensive denudation in both the granite and limestone. There are no signs of any recent upheaval in any of this country, nor, as far as I have seen, anywhere in the Malayan Peninsula, from Keddah to Johore. The country is rich in tin, which has been only partially worked.

There is a palæozoic sandstone clay slate or gneissose formation lying between the limestone and granite. It is much decomposed, and gives rise to a red clay which goes generally by the name of laterite. It is not of great thickness, but is widely represented by outliers at the base of the main ranges, often capping small detached hills. At the junction of this rock with the granite is in my opinion the place where the great deposits of tin have taken place. Wherever such outliers have been denuded away the resulting drift has always been noticed by me as richest in stream tin. On such drifts are the richest mines of Perak, notably Larut, Kamunting, and Assam Kumban. I don't think this palæozoic formation has been previously noticed, but indeed the country is but little known geologically. The slates are very like the Ordovician rocks of Australia, in which so much gold has been found. J. E. TENISON-WOODS
Thaiping, Perak, April 17

The Marine Biological Station and a Coast Survey

ALLOW me to say in reference to your article advocating a Biological survey of the British coasts, that you are quite right in supposing that such a survey falls within the scope of this Association. As a first step in the direction of such a survey the Association proposes to establish a dredging station and observatory on the south coast. Later it will, it is to be hoped, be able to establish or to cooperate in the establishment of additional dredging stations on various parts of the coasts of the United Kingdom, and thus gradually complete a *thorough* (not a superficial) survey such as is needed. The Association will no doubt seek the aid of the Government when the proper time for doing so arrives.

E. RAY LANKESTER
Secretary (*ad interim*) of the Marine
Biological Association

Atlantic Ice and Mild Winters

THE influence of the Gulf Stream in ameliorating the climate of the United Kingdom and of the north-west corner of Europe up to 71° of north latitude is so well known and so generally acknowledged that no comments are required; but can we dis-

cover any force sufficiently powerful by which this great heating power may occasionally be so largely augmented as materially to influence our usual winter temperatures, by bringing to our shores not only a larger flow of warm water, but also impelling it to strike or come into closer contact with our coasts further to the south?

I have, in a desultory way, for a series of years noticed that as a rule mild winters in England were associated with much ice extending far south in the Atlantic. The past winter is a striking example of this. Floe-ice has been more than once met with by steamers in lat. 40° N. and in about the same degree of west longitude, as nearly as possible midway between New York and Ireland, and in the direct ship track between Jamaica and Liverpool. These conditions indicate an Arctic current of very much increased volume, extending something like 400 miles south and an equal or greater distance east of the position given to it on any of the current charts I have examined.

The natural effect of so large a flow of cold water from the north meeting the Gulf Stream at right angles would not only be to deflect the latter to the southward of its usual course, causing it to strike our shores further south, but also in much greater volume, because a larger supply is required to replace the increased quantity from the Arctic.

The only specially cold winds we have had in the past winter and spring have been from the east, with one or two brief exceptions, when there were gales from west and north-west, during which the air, after leaving the Arctic current, *may have* passed so rapidly over the Gulf Stream that it had not time to acquire any great increase of heat.

As was to be expected from the extra quantity of ice on the west side of the Atlantic the winter weather was unusually cold and changeable in Canada and the United States, varying with the direction of the winds.

The meeting of the Arctic current and Gulf Stream has no doubt been seen thousands of times. I had the good fortune to witness it only once, and it reminded me—but on a far grander scale—of two great rivers having waters of different colours, joining each other at right angles, or nearly so, as I have noticed with the McKenzie and some of its tributaries.

We were coming from Portland (February 1860), and our excellent captain had kept far south of the usual track, to avoid ice, so that for several days we were steaming *in* or at the edge of the Gulf Stream. The meeting of the two currents with their eddies—miles wide—was clearly defined, the water to the north being beautifully clear and blue, whilst to the south it had a brown colour with a thin film of haze over it. As we crossed the eddies or “swirls” of current, temperatures were carefully taken, that of the clear water being many degrees lower—I have forgotten the exact difference—than the brown or Gulf Stream.

Probably this whole question may have already been gone into and fully discussed by others; if so, the details have not come under my notice. My chief object is to attract the attention of those who are much better qualified to deal satisfactorily with this interesting subject than I can pretend to be.

4, Addison Gardens, May 10

JOHN RAE

Right-sidedness

IN NATURE for March 20 (vol. xxix. p. 477) Mr. Wharton and Dr. Rae criticise my letter of the 13th on right-sidedness. In writing that letter I had no intention of starting a new subject, but only to remove one source of confusion from the subject of bias in walking. But since the subject is started, I will say a few words in reply.

Neither Mr. Wharton nor Dr. Rae seem to be perfectly normally constituted. Dr. Rae is left-handed, indeed left-sided, by inheritance (I suppose), and right-handed in some things by education. In his case, therefore, the phenomena are more complicated, but there is nothing at all inconsistent with my view or at all different from what I would expect.

Mr. Wharton is near-sighted; his two eyes are of different focal length, and his *left* eye is *much the stronger*. And yet “by unconscious preference” he uses the right eye for the microscope or telescope. Is it possible to have a stronger confirmation of my view?

But he says that if right-sidedness has its cause in the brain, then, since I am right-handed, I ought to be left-eyed, for paralysis of the right side is attended with blindness of the left eye, and *vice versa*. Is this true in all cases? If Mr. Wharton would prove it, physiology would owe him a deep debt. We all