At Fota, in the Cove of Cork, at Bamboo Island, they have lived, fruited, and reproduced themselves for nearly thirty years, and will probably continue to do so in the future, although no Corcagian will be silly enough to believe in consequence thereof that he is living in the climate of "torrid India."

In fact, I adduced the evidence of *Araucaria Cunninghami*, a *most delicate self-registering plant thermometer*, in testimony of the Eocene climate of Bournemouth; and I find myself confronted with Mr. Duncan's clumsy thermometer with *not a single fixed point on its scale*, in the shape of an unspecified "*clump of bamboo canes*." Let Mr. Duncan name the species included in his "clump," and I shall discuss the question fully with him.

The facts stated in my letter, although by no means uncommon, prove most convincingly to those who can appreciate them the untenable nature of Lyell's theory of the cause of change of geological climates.

I must state my argument again :—

1. In Eocene times groves of Moreton Bay pine lived, flourished, and held their ground at Bournemouth against all comers.

2. At the present time groves or forests of Moreton Bay pine live, flourish, and hold their ground at Moreton Bay against all comers.

3. Therefore the climate of Bournemouth in Eocene times was similar to that of Moreton Bay at the present time.

Geologists often make use of syllogisms much less conclusive than the above, which is as good as any commonly used in biological reasoning, such as it is.

The present mean temperature of Bournemouth is 20° F. below what it was in Eocene times, which is equivalent to a difference of latitude in the northern hemisphere between 31° N. and 51° N.

Sir Charles Lyell[1] feebly attempts to get rid of scientific conclusions as to temperature in two ways :—

1. By a denial of the specific identity of the former and recent species compared.

2. By the unproved hypothesis of competing plants whose superior vigour and not climatal conditions, account for the absence of the species which formerly flourished.

In the case of the Moreton Bay pine I shall leave Mr. Gardner to defend the asserted identity of species; and I meet Sir Charles Lyell's second supposition (which is really romance writing, and not science) by the assertion that the Moreton Bay pine, even if protected by man, will perish in any locality whose *mean winter temperature* falls below 57° F.

The present mean January temperature of Bournemouth is 37°·4 F., a temperature which would destroy in a single night a whole forest of Moreton Bay pines.

I was of course well aware that my argument from the former existence of Moreton Bay pines at Bournemouth was only one of many similar arguments that might be advanced from the former existence of plants or corals in localities in which they do not now live.

I know nothing, except from books, of the water temperature necessary for the several species of corals, nor do I know whether any species of the tertiary corals found in England are *specifically identical* with corals now living elsewhere. If Mr. Duncan would give us precise information on this subject he would throw most valuable light on geological climates.

The corals would give us more information upon the question than plants, because they would gauge for us the temperature of the water in England; that is to say, the temperature of the former Gulf streams of the tertiary period, from which we could calculate numerically the increase of solar radiation, necessary to produce such former Gulf streams; and possibly afterwards a measure of geological time.

I have elsewhere[2] shown that the fossil tertiary plant beds of the Arctic regions show a falling off of temperature similar to that which has been proved at Bournemouth, of which the following is a summary :—

	Lat.	Mean annual temperature in Miocene time.	Reduction at present.
	°	°	°
Grinnell Land ...	81·44	42·3 F.	44·00 F.
Spitzbergen	78·00	51·8 ,,	35·30 ,,
Disco	70·00	55·6 ,, Eocene.	36·00 ,,
Bournemouth ...	50·50	70·75 ,,	20·35 ,,

I again assert that it is not possible to explain these facts without introducing causes differing in amount from those now acting on our planet.

SAML. HAUGHTON

Trinity College, Dublin, October 16

[1] "Principles," vol. i. p. 173 (twelfth edition).
[2] "Lectures of Physical Geography," p. 344.

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

I READ with great interest the paper on the Yang-tse, &c., in NATURE, vol. xxii. p. 486. It seems to me that Mr. Guppy has underestimated the quantity of water and sediment in these rivers. As to the Yang-tse, this arises from the year 1877 being one of the driest in Western and Central China generally, and thus the summer flood must have been one of the lowest on record. Besides what we know of the character of the season, an indirect proof of this can be had by comparing the rate of discharge in April and at the time of highest flood, as given by Mr. Guppy, with what is said by Mr. Oxenham, in his paper on the inundations of the Yang-tse.[1] According to the latter the rise of water in April is not very large, the river not yet inundating its banks, and being thirty feet below the summer level. Thus in an average year the discharge in April would by far not equal half of that of August, as found by Mr. Guppy, but more probably be even below one-fifth of that of flood-time.

On this account the data given by Mr. Guppy for the Yang-tse are far below the average as to the discharge of water, and probably even more so as to the amount of sediment, as the proportion of sediment increases during high floods. In 1877 the loess country of North-West China was subject to the severest drought, so that the Han river, which generally contributes so much to the sediment of the main river, must have been very low in summer.

As to the estimation of the discharge of water in the Pei-ho, it is certainly much below the actual quantity, for Mr. Guppy has taken only the months of December to March, *i.e.* months of low water. The monsoon character of the rains, *i.e.* the great prevalence of summer over winter rains, is far more marked in Northern China than in the middle part of that country, so that the flood discharge of the rivers during and after the rains (*i.e.*, from July to October) must be enormously in excess over that of winter. If, as Mr. Guppy says, the Pei-ho rises only six feet at Tien-tsin, this must be due to the banks being very low, so that the river during flood-time inundates the plain to a very great extent.

My conclusion is this :—Mr. Guppy having underestimated the discharge of water of the Yang-tse and Pei-ho in the mean of the year, this must have been even more the case as to the amount of sediment carried. Thus the relatively short time at which he estimates that the surrounding seas will be filled by the sediment carried by the great Chinese rivers has to be greatly shortened, and if he thinks 36,000 years enough for the work, I should estimate that 28,000 years would be sufficient.

A. WOEIKOF

Schpalernajo 8, St. Petersburg, October 15

[1] *Journ.* R. Geog. Soc., 1875.

Greek Fret

IN NATURE, vol. xxii. pp. 513-14, there is a very interesting account of the development of ornament as illustrated by General Pitt Rivers' Anthropological Collection. I would venture to suggest that though in the majority of cases the Greek fret pattern

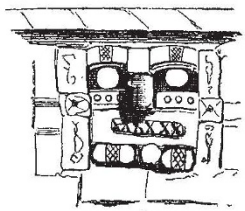

FIG. 1.—Gateway at Labnah (Plate 19).

was independently evolved in different countries from the "double loop-coil," yet a study of the plates in Mr. Catherwood's beautiful work, "Views of Ancient Monuments in Central America" (1844), suggests to me the probability that the builders of those remarkable structures arrived at the "Greek pattern" through a degradation of the conventionalised human