

This letter has already run to great length, but in conclusion I should like to add a few words anent the wooden ornaments already referred to. They are usually turned in a lathe, and in shape are not unlike the ninepins of our childhood, but the knob at the top is originally larger in proportion, and continued upwards into a tenon; the knob is then carved away so as to leave two interlocking loops, and the tenon is fitted into the weather board. At the corners of the roof there are often pendent disks of wood fringed with these ninepins, so as to form a sort of wooden tassel. These would answer well for a rude copy of bells which similarly fringe the roofs of the Chinese pagodas, and it is possible that there is a direct connection between the two, but in any case their association with a concave roof is at least a remarkable coincidence.

B. D. OLDHAM

Camp Matil in the Himalayas, April 9

The Recent Earthquake

SINCE the earthquake of Lisbon in 1755 troubled the waters of the fish-pond, called Peerless Pool, in the London City Road, it has been a well-known fact that earth-waves had a direct influence in producing an alteration in the level of waters inland, as well as in producing tidal waves sweeping the coasts. The earthquake of Tuesday, April 22, has produced a marked, and, so far, permanent, change in the level of underground waters in the district most affected by the shock, but how far this influence extended there is not yet evidence to show, for, judging by past experience, it may probably prove that springs have increased in volume and the underground water-levels have been raised over the whole area affected by the recent shock, which includes the district lying between Broadstairs and Bristol, 165 miles from east to west, and from Spilisbury to Ryde, 170 miles from north to south, and possibly beyond it. It will be of especial interest to know whether the Wealden area, which, as Mr. Topley has pointed out, was free from the more direct influence of the shock, experienced any rise in its underground waters.

At Colchester the water supply is derived from a deep artesian well in the chalk, the supply from which has slightly lessened during the past few weeks, necessitating the lengthening of the suction pipes; and the necessity of still further lengthening them was under discussion, when the Water Committee were agreeably surprised to find that the earth-wave of the 22nd had caused an increased flow of water, and a rise in the water-level of 7 feet, which has so far been maintained.

Earthquakes were described by Mallet "as the transit of a wave of elastic compression." This motion at Langenhoe produced fissures in the gravel walks of the vicar's garden, and at West Mersea opened a fissure a rod in length, which for a short time took off the springs which supply the village with very pure water, and when, after an interval, the pools in which the water accumulates were again full, it was found to be red and thick, and in some of them to be strongly mixed with chalk.

At Bocking the height of the water in Messrs. Courtauld and Co.'s well has been taken weekly for some years; the surface of the well is 137.07 feet above the mean sea-level, and the heights given represent the number of inches the water rises above the surface; the results are very remarkable, the highest previous reading being on Easter Monday, 1883, when it was 19 inches.

The following is the weekly record of the level of water in Messrs. S. Courtauld and Co.'s well, Bocking, Braintree, Essex. The observations are made at 6 a.m. on Monday mornings; no water is drawn from the well on Sunday.

1884		Corresponding period 1883	
	Inches		Inches
March 31	14½	April 2	13
April 7	15	" 9	12
" 14	12½	" 16	13½
" 21	12	" 23	14½
" 28	31½	" 30	16
" 29	32½	—	—
" 30	34	—	—
May 1	34	—	—
" 2	36	—	—
" 3	38½	—	—
" 5	42	May 6	15

The readings being weekly, and the earth-wave occurring the day after the record was taken, unfortunately a week elapsed before the remarkable rise was ascertained; after that the readings were taken daily, showing a continued steady rise in level.

These facts tend to show that the recent earth-wave has caused the fissures to open, and to permit a freer circulation of water, and that consequently the "cone of exhaustion" has been filled up with water; and that the only example of this effect so far received should be from chalky districts is not surprising when it is remembered, as Prof. Ansted pointed out, that, though the chalk absorbs water freely, it parts with it slowly, the water derived from chalk-wells being due more to water travelling in the joints and fissures than to the water stored in the chalk itself. It would appear probable that when the increased volume of water now running off, through the enlarging of the sectional area of the fissures, is again lowered by pumping, the old artesian gradients will be resumed, and that the present increase will be only temporary.

As Secretary of the Underground Water Committee of the British Association, I shall be glad to receive any further information on these phenomena.

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FROM recent observations I have concluded that the seismic vertical was at or near Dr. Green's house, close to the Strood or Causeway which connects the mainland of Essex with Mersea Island. The house was built in 1860, and is therefore new. I may here observe that (as I hinted before in former letters) the modern, cheaply-built cottages were not so much affected as the more ancient ones. The chimneys, walls, &c., of the latter were invariably destroyed, damaged, or cracked—the former seldom so. I was much surprised at this. The first thought naturally was that these "jerry-built" houses would be shaken down like a pack of cards. Is it that their very looseness of structure is in their favour, as compared with the stronger-built cottages of two and three hundred years ago? I have somewhere seen that in earthquake-visited centres the houses most secured from destruction are the loosely-built, low edifices. One can speak plainly on this matter, as no premium is required to encourage the development of "jerry-building."

Dr. Green's house is literally split and cracked in all directions, and the splits and cracks are the most vertical of any to be seen. The entire building was twisted on its foundations. At the south-west corner this is visible to the amount of about one inch and a half. Dr. Green informed me he was lifted up, as if from behind, and shot violently forward.

A friend of mine remarks (and I noticed the same fact in my note-book, but omitted inclosing it in my last communication) that the railway cutting at Wivenhoe appears to have broken the continuity of the undulations, for the houses contiguous to it are comparatively uninjured.

A noteworthy fact in connection with the recent earthquake, to which I can personally testify, and which appears to be the general experience of all the most trustworthy observers I have come across, is that the sounds or noises preceded the oscillations for an appreciable period of time. Mallet's experiments showed that the shock of an explosion travelled through wet sand at the rate of 951 feet per second. In Ipswich we are situated chiefly on drift sands and London Clay, and allowing that the earthquake shocks travelled through these strata at a more rapid rate, it is not likely to have been much more rapid. As sound travels at the rate of 1118 feet per second, it is very probable that the noise accompanying the earth-movements preceded the oscillations.

Mr. Wilkins, the well-known yacht-builder at Wivenhoe, tells me he was standing at the time the earthquake occurred in the yard, and his first impression was that a new yacht he was looking at was heeling over, and he called out so to his workmen in the shop close by. Then followed the crash of the tall chimney and the rending of the walls. The workshop has an upper floor, with windows on each side, and, as he stood in the yard, Mr. Wilkins says the oscillatory waves were such that he was enabled to look right through these windows, so as to see the falling chimneys of the buildings on the other side. He calculates that there must have been a rise and fall of the ground of 2 feet 9 inches to have enabled him to do this.

On Saturday, May 3, the members of the Ipswich Scientific Society made an excursion to Langenhoe and Peldon, and Mr. Henry Miller, C. E., the honorary secretary, kindly took the following exact measurements of the rents seen in a building adjoining Peldon Mill. There are two of them, succeeding each other at a short distance, and they pass through the brickwork at an angle of just 30°. At the gable end of this building there is