

undulations must affect the level of the base of the Chalk, and in constructing my map showing levels in the base of the Chalk I was without adequate data concerning these anomalous levels in this particular area. With the incorporation of a sufficiency of data in the maps the final result would agree with field observations—and while the data accumulate a faulty map is better than no map.

H. A. BAKER.

AFLOAT,
H.M.S. "CARYSFORT".
July 25, 1918.

NOTES AND QUERIES FROM NEW ZEALAND.

SIR,—I am forwarding two photographs in which perchance some of your readers may be interested. One represents the common rhombohedral multiple twin of calcite, seen on a weathered surface of the mineral, and the other an unknown fossil. [We omit the description of the photographs, which is appended to the figures given below.—ED. GEOL. MAG.]

I have discarded all thought of inorganic origin for the "fossil" on account of the great regularity and the successive layers shown, but can offer no convincing suggestion as to the actual nature, and shall be grateful for any information thereon.

JOHN A. BARTRUM (Lecturer in Geology).

UNIVERSITY COLLEGE,
AUCKLAND, NEW ZEALAND.
May 6, 1918.

Having referred Mr. Bartrum's photographs to our colleagues Dr. G. F. H. Smith and Dr. F. A. Bather, of the British Museum (Natural History), Cromwell Road, we have been favoured with the following remarks thereon.—ED. GEOL. MAG.



FIG. 1: CALCITE CLEAVAGE.—This shows clearly the crossing lamellæ seen on a weathered surface of a specimen of twinned calcite from Port Waikato, New Zealand. The lamellæ are usually rendered conspicuous owing to readier solution along the composition planes, but occasionally it appears as if there has been differential solution of the opposed sets of twin-lamellæ.—G. F. H. S.



FIG. 2: CRUSTACEAN TRACKS IN NEW ZEALAND TERTIARIES.—This photograph, of natural size, depicts a portion of a large slab of soft sandstone recently exposed in strata of Middle Tertiary age along Beach Road, Auckland, New Zealand. The surface is covered with feather-like or fern-like markings which represent casts formed in the tracks left by some creature. The track (not the cast) consists of a median groove from which leaf-like imprints are given off on each side. The groove, which has a semicircular section, is about 5 mm. wide and pursues a gently sinuous course. Each appendage is about 13 mm. long, has a curved free margin, the curve having a radius of about 19 mm., and is overlapped by the corresponding margin of the adjacent imprint at a distance varying in different appendages from 3.5 to 6 mm. The greatest width in each case is at about two-thirds the distance from the point of origin. The axis of each appendage forms with the median axis of the whole imprint an angle varying between 35° and 75° , the greater angle usually being on the convex side of a sinuosity in the median track. It is hard to say whether the appendages are opposite or alternate.

Markings like those in Fig. 2 were formerly assigned to marine algæ (Chordophyceæ) or to annelids (*Nereites*), but the observations of many naturalists, summarized and supplemented in Nathorst's

classical memoir "Om spår af några evertebrerade djur, etc." (1881, K. Svenska Vet. Akad. Handl., vol. xviii, No. 7), have shown that they are almost certainly to be attributed to Crustacea. Such a track as the present one was probably formed by a large crustacean swimming close to the sea-floor rather than crawling on a mud-flat. It is of the same general character as *Polykampton alpinum* Ooster, 1869, from the Rhætic of Switzerland ("Protozoë Helvetica," vol. i, p. 23, pl. iv), and *Delesserites foliatus* R. Ludwig, 1869, from the Upper Devonian of Dillenburg (*Palæontographica*, vol. xvii, p. 113, pl. xx, fig. 4).—F. A. B.

OBITUARY.

E. A. NEWELL ARBER,
M.A., Sc.D., F.G.S., F.L.S.

BORN AUGUST 5, 1870.

DIED JUNE 14, 1918.

(WITH A PORTRAIT, PLATE XV.)

EDWARD ALEXANDER NEWELL ARBER was born at No. 5 Queen Square, Bloomsbury, in 1870. His father was Edward Arber, afterwards Professor of English at Mason's College, Birmingham, and known as the editor of many English classics. His mother (*née* Marion Murray), the daughter of a Glasgow publisher, was the niece of Dr. John Sutherland, an early authority on army sanitation, who was closely associated with Florence Nightingale's work in the Crimea.

Newell Arber had much illness in early boyhood, and at the age of fifteen he was sent, for the sake of his health, to Davos, where he spent more than a year. It was during his first Swiss summer that he awoke to the fascination of botany; his interest in geology was aroused later, apparently at the beginning of his Cambridge career. In 1895 he came up to Trinity College, and after an undergraduate period broken by ill-health, he took the two parts of the Natural Sciences Tripos in 1898 and 1899, specializing in Botany and Geology.

In 1899 Professor T. McKenny Hughes nominated Newell Arber to a Demonstratorship in Palæobotany in the Woodwardian (afterwards Sedgwick) Museum. This post, which he held for the rest of his life, involved the curating of the palæobotanical collections, as well as elementary and advanced lectures and demonstrations in fossil botany. Newell Arber threw himself enthusiastically into museum work, and during his tenure of the Demonstratorship about 5,000 plant fossils were added to the collections, almost entirely through his instrumentality. Between 1901 and 1906 he was also responsible—in the first year, under Dr. Henry Woodward, and after that, under his successor, Dr. Arthur Smith Woodward—for the naming and arrangement of the palæobotanical specimens in the Geological Department of the British Museum (Nat. Hist.). He consolidated his knowledge of fossil plants by repeated visits to most of the principal museums in Europe in which important collections are to be found.

Research flourished in Newell Arber's laboratory, where, in