

LETTERS TO THE EDITOR.

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Discovery of Fossils in the Chert and Black Shale Series at Aberfoyle.

THE greatest riddle in Scottish geology at the present day is that of the true stratigraphical position of the series of metamorphic rocks in the central, southern, and eastern Highlands which Sir Archibald Geikie has included under the term "Dalradian." These rocks have been mapped and to a large extent described by officers of the Geological Survey, and have been much discussed by others, but no agreement has been reached as to the structure of the area or the relations of various members of the series to each other. Even the question as to which is the top and which the bottom of the succession of deposits is still unsettled. One great difficulty met with is the lack of organic remains in the altered sediments. But fossils have recently been discovered in the group of rocks which Prof. J. W. Gregory conveniently terms the "Boundary Fault Series." This series has been traced as an interrupted belt along the southern border of the Highlands from Stonehaven on the east to the island of Arran on the west, and it is prolonged into Ireland. The best exposures in Scotland occur in Arran, in the district between Loch Lomond and Callander, and in Forfarshire and Kincardineshire. They consist of cherts or jaspers and shales, sometimes associated with limestones and with some peculiar igneous rocks.

The rocks of this belt often present a close resemblance to some of the Arenig rocks in the Southern Uplands of Scotland, and were provisionally correlated with the latter by Messrs. Peach and Horne in their volume on "The Silurian Rocks of Britain," vol. i., Scotland (Mem. Geol. Surv., 1899). Bodies recognised as remains of Radiolaria were detected by Dr. Peach in the cherts near Gualann, east of Loch Lomond.

The belt has been marked on the Geological Survey maps as doubtfully Lower Silurian. The exposures which occur along the Highland boundary in Forfarshire and Kincardineshire have been described by Mr. G. Barrow (Quart. Journ. Geol. Soc., vol. lvii., 1901), and there the "Jasper and Green-rock Series" is associated with a younger group of argillaceous and calcareous strata termed the "Mergie Series."

More recently Dr. R. Campbell has recorded the discovery of fossils in the black shales, jaspers, and cherts intercalated in a series of crushed green igneous rocks north of Stonehaven, which points to the probability that the sediments are of Upper Cambrian age (*Geol. Mag.*, N.S., Decade V., vol. viii., 1911).

After spending many months in searching the black shales and cherts in the neighbourhood of Aberfoyle, I have at last been fortunate in finding a number of fossils in those beds. These have been submitted to Dr. Peach for determination. He has recognised the casts of hingeless brachiopods, some of which appear to be referable to the genus *Lingulella* and some to the genus *Obolus*; the collection also includes the jaw of an annelid. The evidence, so far as it goes, which is afforded by these fossils as to the age of the Boundary Fault Series

tends to confirm the view that it is Upper Cambrian, or at any rate Lower Palæozoic.

Further search is being made for fossils in the belt between Loch Lomond and Callander, and a fuller communication will be made at the British Association meetings in Dundee in September.

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The Protection of Nature in South Bavaria.

THERE appeared in NATURE of April 27, 1911 (vol. lxxxvi., p. 286), a very interesting paper by Mr. A. E. Crawley, "Germany and the Protection of Nature."

It will perhaps interest readers of NATURE to have a few particulars about this scheme of protection from one of the best centres, namely, in the health resort of Berchtesgaden, in the Bavarian Alps, the shooting residence of the Prince Regent Luitpold of Bavaria.

We find there different connected systems of protection. The Government has ordered that all wild plants of commerce, as well as rare specimens, are to be protected. Without special permission nobody may remove the following plants:—*Leontopodium alpinum*, *Rhododendron hirsutum*, *R. intermedium*, *R. ferrugineum*, *Rhodothamnus chamaecistus*, *Loiseleuria procumbens*, *Helleborus niger*, *Cypripedium calceolus*, *Primula auricula*, *Gentiana pannonica*, *G. purpurea*, *Nigritella suaveolens*, *Orchis ustulata*, *Chamaeorchis alpina*, *Ophrys muscifera*, *Gentiana acaulis*, *Lilium martagon*, *Platanthera bifolia*, *Scolopendrium officinarum*, *Cyclamen europæum*, *Achillea clavennae*, *Imperatoria ostruthium*, *Nymphaea alba*, *Ilex aquifolium*, *Taxus baccata*, *Pinus cembra*, &c.

When we examine the names of these plants, we see that many of them are remarkable for a limestone flora. Tables with coloured flowers show the exact form of specimen under consideration, and the waiting-rooms in railway stations, as well as the foyers in the big hotels, have excellently painted illustrations of the protected plants.

This system, however, is not sufficient alone; large mountain areas are also protected, and are called "Pflanzen-Schonbezirk." This applies to nearly all the great mountains which border the Königsee near Berchtesgaden, the pearl of the German lakes. No one has the right to collect here any plant, except a few men of science with special permission of the Government. Some rare butterflies, as *Parnassius Apollo*, var. *Bartholomæus* (the only known locality for this variety is the surroundings by the old shooting residence "St. Bartholomä" on the Königsee), are also protected. Infringement of these rules involves a fine up to 7*l.* 10*s.*, or imprisonment. The protection is under the control of the Forest Department, and is left to the cooperation of the public.

In the district of Berchtesgaden is also the well-known health resort Bath Reichenhall. Here is an Alpine garden at an altitude of 400 metres for the limestone flora of the Bavarian Alps.

C. C. HOSSEUS.

A Simple Eclipse Experiment.

THE phenomena of an eclipse may be well reproduced by a simple experiment made as follows:—

Make a smooth round hole, about one-eighth of an inch in diameter, in a visiting card or thin sheet of metal, and allow the rays from the sun or other source of light to pass through the hole and fall on