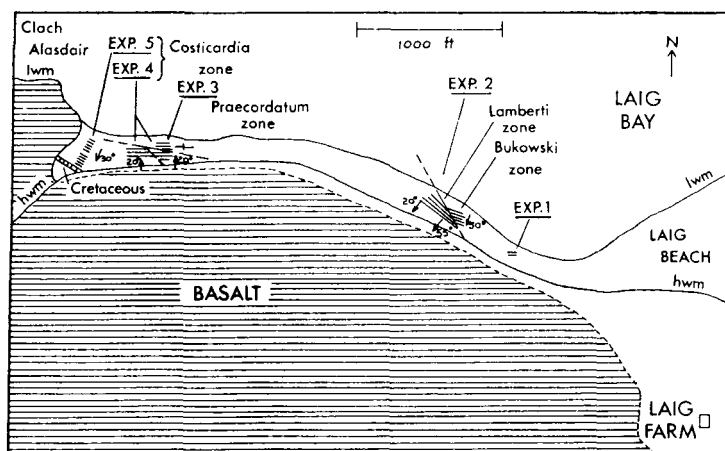


## CORRESPONDENCE

### THE SO-CALLED OXFORDIAN SHALES OF EIGG, INNER HEBRIDES

SIR,—In 1960, J. D. Hudson reported that a derived specimen of the Lower Oxfordian *Scarburgiceras* had been discovered in the basal conglomerate of the Cretaceous on Eigg, a discovery which suggested that either the *mariae* or *bukowski* Zone is probably present on the island. Previously, the only Upper Jurassic ammonites recorded from the island were *Cardioceras cordatum*, *Cardioceras excavatum* and *Aspidoceras peraramatum* (Barrow, 1908), and the conclusion was reached that only the upper part of the Oxford Clay was represented (Arkell, 1933). During a visit to the island made by the author in the summer of 1961, a close examination was made of all the Upper Jurassic exposures, with the object of determining exactly which zones occur



TEXT-FIG. 1.

on the island. The surprising result of this work has been the discovery of an Upper Callovian *Quenstedtoceras* fauna, as well as substantial developments of Lower Oxfordian.

The "Oxfordian" shales of the Island of Eigg occur in scattered outcrops in the intertidal zone on the boulder strewn beach between Laig Farm and Clach Alasdair, on the west coast of the island. During 1961, the state of the beach was very favourable, and the map (Text-fig. 1) was prepared. The sediments are almost all silty shales, which break down readily in water. They range from poorly to well laminated, and contain occasional thin beds of smooth-textured, white limestone. Tectonic disturbance has been considerable, the beds lying at various angles between horizontal and vertical. There is much faulting, and it is thus impossible to determine accurately the total thickness of the beds concerned; this must be at least 100 feet, however.

The lowest Upper Jurassic beds whose age has been definitely established are of *lamberti* age. The outcrop occurs in the middle of the area mapped as Oxfordian Shale by the Geological Survey (Exposure 2). The beds, which are at least 25 feet thick, are steeply dipping, and strike along the beach for 100 yards. The section begins with 3 feet of silty shale, followed by a prominent, tough white limestone, 1 ft. thick. In shale 6 inches above occurs the main fossiliferous horizon. Ammonites are preserved solid in pyrite, and

include *Quenstedtoceras* (*Quenstedtoceras*) sp., *Q.* (*Lambertoceras*) spp., *Q.* (*Prorsiceras*) aff. *gregarium* (Leckenby), and *Longaeviceras* sp. There follows some 25 feet of almost unfossiliferous shale. Twenty feet above the limestone was found a specimen of *Quenstedtoceras* (*Lambertoceras*) *henrici* Douvillé. It is likely, therefore, that the whole of this shale is of *lamberti* age.

No trace was found of the *scarburgense* Zone, but beds of this age may well be hidden by faulting, or by beach boulders.

Beds of *praecordatum* age, dipping almost vertically, occur in a small outcrop approximately a quarter of a mile east of Clach Alasdair (Exposure 3). There are seen here 10 feet of very soft, silty, well laminated shale, with several horizons containing crushed ammonites in abundance. *Cardioceras* (*Scarburgiceras*) *praecordatum* Douvillé is common, and specimens of *C.* (*S.*) *mirum* Arkell, *C.* (*S.*) cf. *mirabile* Arkell and *C.* (*S.*) *subexcavatum* Maire were collected. Belemnites are also common.

The *bukowski* Zone is represented by only one small outcrop of tough silty shale, faulted against the larger outcrop of *lamberti* age previously mentioned (Exposure 2). Ammonites are few, but the finding of an excellently preserved specimen of *Cardioceras* (*Scarburgiceras*) *harmonicum* Maire leaves one in little doubt as to the age of these beds.

In extent of outcrop, the *costicardia* Zone is easily the best represented. Tough, flat lying, close grained grey shales are exposed in the beach 300 to 400 yards east of Clach Alasdair (Exposure 4). They contain *Cardioceras* (*Vertibriceras*) aff. *quadrarium* S. Buckman, *C.* (*Cardioceras*) *costicardia* S. Buckman, *Peltoceras* (*Peltoceroatoides*) aff. *williamsoni* (Phillips) and *Aspidoceras* sp. This is a typical *costicardia* Zone fauna. Sandy shales of this age are well exposed dipping at 20 degrees beneath the tholeiitic columnar basalt of Clach Alasdair (Exposure 5). Some 20 feet down in this section, near low water mark, was found *Cardioceras* (*Cardioceras*) aff. *persecans* (S. Buckman), while a marked fossil band occurs beneath the overlying Cretaceous sandstone, containing *C.* (*C.*) *costicardia*, *Cardioceras* spp., lamellibranchs and belemnites.

I should like to thank Mr. G. G. Watson, the founder director of the Young Naturalists Association of Great Britain, for his help and encouragement, and Dr. W. E. Smith for useful advice and criticism.

#### REFERENCES

- ARKELL, W. J., 1933. *The Jurassic System in Great Britain*, Oxford  
 BARROW, G., 1908, in . . . The Geology of The Small Isles of Inverness-shire. *Mem. Geol. Surv.*  
 HUDSON, J. D., 1960. The Laig Gorge Beds, Isle of Eigg *Geol. Mag.*, **97**, 313-322.

J. K. WRIGHT.

DEPARTMENT OF GEOLOGY,  
 CHELSEA COLLEGE OF SCIENCE AND  
 TECHNOLOGY,  
 August, 1963.

#### HISTORICAL GEOLOGY OF IRELAND

SIR,—Dr. McKerrow's recent review (*Geol. Mag.*, **100**, 284) of my book, *Historical Geology of Ireland*, contains a factual error which should, I think, be corrected. The error is in the following sentence:

"In this connection, there is one important 1960 reference that has been overlooked and which will undoubtedly stimulate discussion on Irish geomorphology: P. T. Walsh. An occurrence of Cretaceous Chalk in the Killarney District, Eire, *Proc. geol. Soc. Lond.*, **1581**, pp. 112-13."

Not only is the occurrence, with reference, given a paragraph of sixteen lines in its appropriate place in the chapter on the Cretaceous (pp. 369, 370) but the implication of the discovery in the history of Ireland's geomorphology