at one time the softer beds were worked up into slate-pencils.

The Teesdale Inlier was discovered in the latter part of the last century when the highly cleaved slates were described as probably Skiddaw Slates, Lower Ordovician, by Dakyns[1] in 1877. A further account of the inlier in 1878 by Gunn and Clough[2] referred the slates tentatively to the Silurian Stockdale Shales. Later authors followed Gunn and Clough in regarding the slates as probably Silurian until Kendall and Wroot[3] revived the view that they were better placed in the Skiddaw Slate Series, and this latter view was supported by Dunham[4]. Five mica-lamprophyre dykes are intruded into the slates in the vicinity of the Pencil Mill and have been described by Williams[5]. The lavas at the western end of the Inlier are tentatively referred to the Borrowdale Volcanic Series.

The first fossils to be found in the slates of the inlier were collected near Pencil Mill by Mr. G. F. Lea during a Durham undergraduate geological mapping exercise in the spring of 1959. The specimens consisted of poorly preserved graptolites which were not found *in situ*. Several subsequent visits to the inlier in search of further graptolites were unsuccessful, but some small elongated thin-shelled fossils were obtained which are believed to be phyllocarid crustacean carapaces and tentatively referred to ? *Caryocaris* sp. On a further recent visit to the inlier three more graptolites were obtained from slate scree in the Pencil Mill workings and the preservation of these specimens is more definite. It is noteworthy that all the fossils found in the slates of the inlier are inconspicuous to the naked eye, and it is undoubtedly owing to this that they have remained undiscovered until the last few years.

The graptolites found in the Teesdale Inlier have been examined by Prof. O. M. B. Bulman, who has made tentative identification of the specimens as follows : ? *Cryptograptus* sp. ; *Glyptograptus dentatus* (Brongn.) ; *Didymograptus* sp., the proximal end of a pendent didymograptid, possibly *D. climacograptoides* Holm MS. (Bulman).

This fauna, particularly the presence of pendent didymograptid in association with *G. dentatus*, is sound evidence of Lower Ordovician age and shows that the beds belong to the upper part of the Skiddaw Slate Series. Prof. Bulman suggests that the slates of the Teesdale Inlier may in fact be an easterly extension of the Ellergill Beds, the central division of the Skiddaw Slates of the Cross Fell Inlier. The presence of ? *Caryocaris* sp. in the Teesdale slates is supporting evidence for Skiddaw Slates Series age. Thus the long-disputed question of the age of the slates of the Teesdale Inlier is finally solved by the discovery of a graptolite fauna.

The advice and assistance of Prof. O. M. B. Bulman and Mr. J. D. D. Smith, who kindly examined the graptolites and other fossils from the Teesdale Inlier, are gratefully acknowledged.

G. A. L. Johnson

Department of Geology,
University Science Laboratories,
South Road, Durham.

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Ekanite, a New Metamict Mineral from Ceylon

Since 1953, several specimens, the largest about 44 gm., of a green transparent–translucent mineral, which when cabochon-cut as a gemstone may show some asterism, have reached Europe. The mineral occurs in the gem pits of Eheliyagoda, Raknapura district, Ceylon, and was originally found there by Mr. F. L. D. Ekanayake, who suspected that it might be a new species. This has now been confirmed by chemical and physical study, of which the principal results are given here.

The mineral is metamict, and an analysis by Mr. D. I. Bothwell gave: SiO_2 55·6, ThO_2 27·6, UO_2 2·1, Fe_2O_3 0·5, CaO 13·7, PbO 0·8 per cent, with traces of Al_2O_3, MgO, MnO, total 100·3 per cent, yielding the formula:

$$(Th,U)(Ca,Fe,Pb)_2Si_8O_{20}$$

The refractive index and density of the mineral as found are 1·5969 and 3·280 respectively. After heating at 510° C. for 24 hr. these constants fall to 1·5933 and 3·276.

At temperatures between 650° and 1,000° C., the mineral re-crystallizes to a phase of which X-ray powder and single-crystal diffraction patterns can be indexed on the basis of a body-centred tetragonal cell having dimensions a 7·46, c 14·96 Å. The density after heating at 1,000° C. for 24 hr. rises to 3·313 and the mineral becomes opaque putty-coloured.

Heating at higher temperatures involving re-melting leads to the development of the thorium silicate, huttonite. If the mineral is fully melted and then re-crystallized at 1,000° C., the product appears to be a thorium analogue of the britholite–lessingite–cerite group[1].

Besides some microscopic inclusions parallel to two directions at right angles, ekanite contains occasional larger opaque inclusions not yet identified with certainty.

The mineral is named after the discoverer. A full account will be published elsewhere.

B. W. Anderson

The Laboratory of the
London Chamber of Commerce,
15 Hatton Garden, London, E.C.1.

G. F. Claringbull
R. J. Davis

Department of Mineralogy,
British Museum (Natural History),
London, S.W.7.

D. K. Hill*

Department of Glass Technology,
University of Sheffield.

*Present address: British Indestructo Glass, Ltd., London, N.W.10.

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METALLURGY

Arc Initiation on Heated Metals by a Hydrogen Discharge

An undesirable phenomenon of importance to experimental investigations of toroidal pinched gas discharges is the formation of unipolar and power arcs at metallic parts of the system exposed to the plasma[1]. Previous work[2,3] has indicated the important part played by insulating inclusions in metals in the process of arc initiation under these conditions. We are investigating the arcing characteristics of refractory metals, exposed to a toroidal discharge in pure