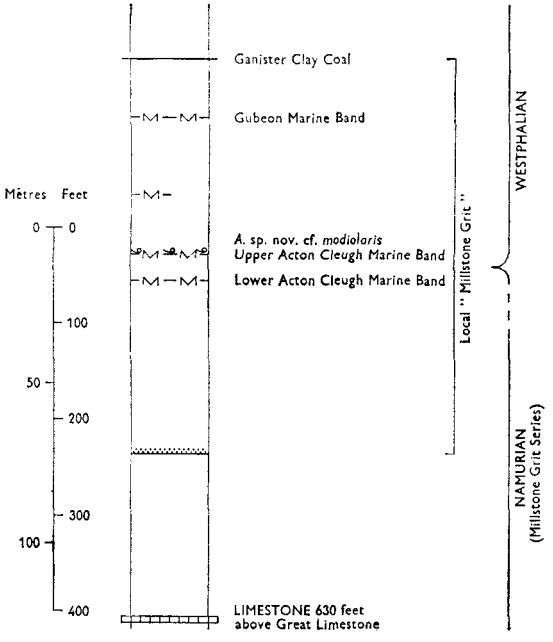
CORRESPONDENCE

A NON-MARINE LAMELLIBRANCH FROM THE "MILLSTONE GRIT" IN NORTHUMBERLAND

SIR,—The term "Millstone Grit", as formerly used on Geological Maps of Northumberland and Durham, meant the strata (ranging 250–?600 feet thick) between the top of the Bernician "Upper Limestone Group" and the base of the local "Coal Measures". Besides sandstones, which are locally thick and coarse, these strata consist mainly of shales, seatearths, and coals up to 2 feet thick.



TEXT-FIG. 1.—Suggested position of Namurian-Westphalian junction in the Blanchland area

Armstrong and Price (1954) took the base of the "Coal Measures" at the Ganister Clay Coal, but the base of the Westphalian is now believed (*Summ. Prog. Geol. Survey* for 1962, p. 46; Magraw *et al.*, 1963) to be some distance below this coal. The top of the "Upper Limestone Group" has often been taken at the base of the lowest sandstone assigned to the "Millstone Grit", and this is probably not everywhere at the same horizon. Goniatites of R1 age occur in Durham immediately below the lowest "Millstone Grit" sandstone (*Summ. Prog. Geol. Survey* for 1962, pp. 45–6). Thus the Namurian-Westphalian junction is probably within the "Millstone Grit". The occurrence here described assists in its closer definition.

At Acton Cleugh, 2½ miles N.N.E. of Blanchland, two marine (*Lingula*) bands, here named Lower and Upper Acton Cleugh, separated by an interval averaging 30 feet, lie about midway in the "Millstone Grit". The upper band lies about 200 feet below the Ganister Clay Coal (Text-fig. 1). The

lower band, and the coal directly below it, are exposed in an adit in Acton Cleugh.

A nearby N.C.B. borehole at NY9758654600 proved black siltstone between 102 ft. 8 in. and 103 ft. 9 in.; *Lingula mytilloides* J. Sowerby at the base of this bed represents the Upper Acton Cleugh Marine Band. The bulk of the siltstone yielded *Rhadinichthys* scales, Palaeoniscid scales, and (towards the top) *Anthraconaia* sp.

This *Anthraconaia* appears to be an undescribed form belonging to the *A. modiolaris* group. According to Mr. M. A. Calver and Dr. J. Weir (*in litt*) it is likely to be from the Westphalian rather than the Namurian. Similar forms have been recorded near the *lenisulcata-communis* boundary in South Wales (Calver in Woodland, Archer and Evans, 1957, p. 56) and in the Pennines (Calver, 1955, Fig. 4). In view of the presence of marine bands higher in the sequence (Text-fig. 1) it must be supposed that the horizon of the present occurrence is within the *lenisulcata* Zone.

This find implies that much (here, at least 200 feet) of the " Millstone Grit " must be assigned to the Westphalian. Existing records of this form of *Anthraconaia* are all at horizons above the *G. listeri* Marine Band. Probable correlatives of the Lower Acton Cleugh Marine Band, however, at no great distance from the present locality, yield *Dunbarella* and productids, and this may mean that this Marine Band should be referred to a horizon not higher than one of the basal marine bands of the Westphalian. Productids are not so far known above the *G. subcrenatum* Marine Band (Calver in Owens and Burgess, 1965, p. 26). Thus the Namurian-Westphalian junction may be not far below the present occurrence, and might perhaps reasonably be drawn at, or shortly below, the base of the Lower Acton Cleugh Marine Band.

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AN UNCONFORMITY IN THE TORRIDONIAN

Sir,—In a recent paper by Harland *et al.* (*Geol. Mag.*, **103,** 70–97), the Torridonian was supposed to form an unbroken stratigraphic sequence unconformably overlying the Lewisian basement complex and unconformably overlain by the Cambro-Ordovician (*op. cit.*, Table 3). This, the orthodox view, needs substantial modification.

In 1957 Irving and Runcorn showed that the palaeomagnetic pole directions from the Torridonian between Stoer and Applecross formed two distinct clusters. The field measured at eighty-one sites in the upper part of the