EXCURSION REPORT: LATHKILL DALE AND PILSBURY, DERBYSHIRE.

Leaders: N. Aitkenhead and J.I. Chisholm Sunday, 12th June, 1977.

The purpose of the excursion was to examine the youngest (D_1-D_2) [1] part of the Derbyshire Carboniferous Limestone, first on the relatively stable 'shelf' area of deposition, and then at the boundary between the shelf and a more rapidly subsiding 'basin' that lay to the west. On the shelf there is an unbroken sequence of shallow-water limestones but at the shelf margin the sequence is interrupted by erosional breaks and diversified by the presence of apron-reef limestones dipping outwards towards the basin. The sequences in the two areas are compared in Table 1. The recently published 1:25000 geological sheet SK16 (Monyash) covers both areas (Chisholm, Aitkenhead and Price 1977).

The party assembled at Monyash and were taken by coach to Haddon Grove, SK 180 662, where the morning's leader, J. I. Chisholm, pointed out that the surrounding gentle slopes of the limestone plateau approximate to dip-slopes, developed on surfaces near the top of the Monsal Dale Limestones.

The strata lie in a broad shallow syncline, the Monyash Syncline; Lathkill Dale is incised into the axial region of this structure. The party descended into Lathkill Dale by a track, the sides of which provide a good section through the Monsal Dale Limestones. Pale limestones predominate in the top part of the sequence, and contain a cherty shell bed (Lathkill Shell Bed) full of brachiopods in a concave -up position. The band has proved to be an excellent marker horizon, invaluable in the mapping of this area. It is recognisable throughout Lathkill Dale and extends eastwards into Bradford Dale, SK 202 639, and northwards to Bole Hill, SK 184 676.

At Carters' Mill, SK 1839 6579, the party paused to examine thinly bedded dark limestones that underlie the pale limestones, and the possible reasons for the colour difference were discussed. The greater concentration of hydrocarbons in the dark facies is traditionally regarded as the main factor, but the higher clay content of dark limestones may also play a part. The party then walked up the dale towards Monyash, stopping briefly to collect silicified corals in the dark limestone, and to examine the source of the River Lathkill. At Ricklow Quarry SK 165 661 the party climbed up the dale side to see a reef knoll in the Eyam Limestones, which rest sharply on the Monsal Dale Limestones. Most time was spent examining the limestones that abut against the knoll, including a coarsely crinoidal limestone (the quarried bed) and dark well-bedded limestones.

After lunch at Monyash the party proceeded across the outcrop of the older Bee Low Limestones to the vicinity of Pilsbury where an outlier of Monsal Dale Limestones forms a shallow syncline on the shelf (north-east) side of the discontinuous apron-reef. A brief stop was made on the north-eastern flank of this syncline, SK 1207 6364, to examine small exposures showing the contrast between the pale Bee Low Limestones and the overlying dark shelly basal beds of the Monsal Dale Limestones. The apron-reef itself was then examined where it crops out on the steep hillside, 1192 6325, overlooking the road between Pilsbury and Parks Barn. The reef-limestones here are typical of the facies, being pale grey, poorly bedded, and fine-grained or micritic, with a rich brachiopod fauna. At the top of the hillside, SK 1200 6329, at a level estimated to be c. 9.0 m stratigraphically above the top of the apron-reef, the party examined a 10 m crag of pale limestone made up largely of brachiopod shells. The fauna has been examined by M. Mitchell of the Institute of Geological Sciences who reports that it consists mainly of gigantoproductoids including *G. edelburgensis* and *Linoprotonia hemisphaerica*, and is probably of D_2 age. A nearby gully, SK 1209 6325, immediately above Parks Barn exposes some 18.7 m of limestone below the level of these shelly beds. Near the base of this sequence members examined a 1.6 m bed of conglomerate in which rounded pebbles of micrite are dispersed in a coarsely crinoidal matrix.

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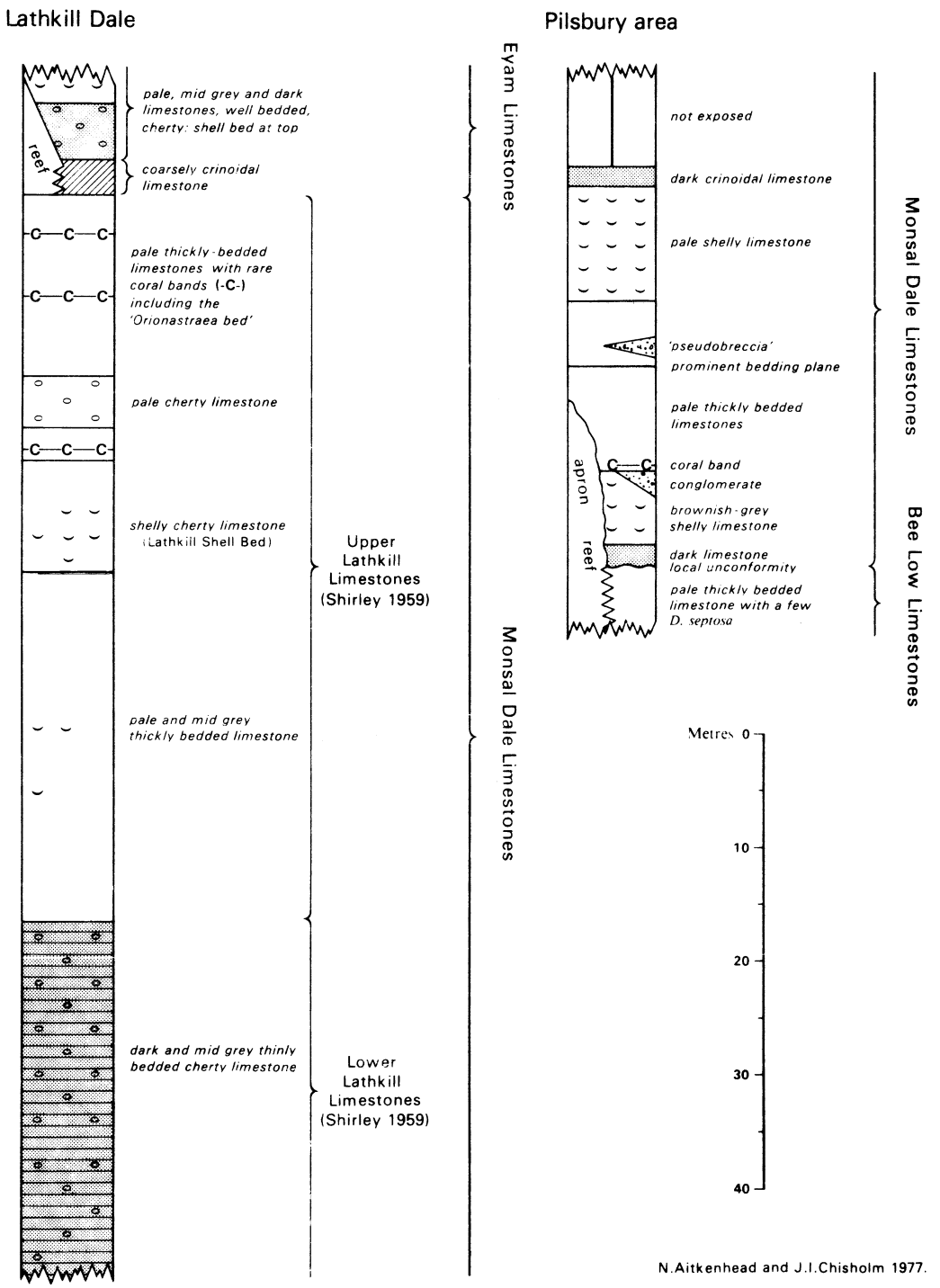
1. The coral-brachiopod zones D_1 and D_2 are broadly equivalent to the Dinantian stages Asbian and Brigantian of George *et al.* 1976

Mercian Geol. Vol.7, No.1, 1979
pp 75-77, Table 1.

Table I – Generalised sequences



N.Aitkenhead and J.I.Chisholm 1977.

There seemed to be general agreement that the conglomerate may have resulted from the erosion of the D_1 apron-reef during exposure to wave action in early D_2 times (see also Ludford, Madgett and Sadler 1973). A coral band immediately overlying the conglomerate has yielded *Lonsdaleia* ?, and a specimen of *Palaeosmilia regia* has been collected from a continuation of the band 110 m to the south-east. These identifications, made by M. Mitchell, indicate the D_2 age of this sequence. The overlying beds in the gully were seen to consist mainly of pale fine-grained limestones except for one bed of pseudobreccia 0.3 to 1.4 m thick. Various possible origins for this bed were discussed including palaeokarstic and bioturbation processes.

Leaving the limestone, the party traversed the valley of the River Dove cut in Namurian shales of mainly E_2 to R_1 age, and ascended, in a last burst of exercise, the escarpment below Sheen Hill formed by the Sheen Sandstones. The lowest leaf of these sandstones is closely underlain by the *Reticuloceras bilingue* (early form) Marine Band and when crossing the outcrop of this band one of the leaders suddenly plunged into a bramble-infested gully to emerge some minutes later clutching a few specimens of the eponymous goniatite as confirmation of the mapped line at this point SK 1128 6302, (Chisholm, Aitkenhead and Price 1977).

The coach was waiting at the top of the slope for the party's return to Nottingham.

References

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