EXCURSION TO THE COTSWOLD HILLS

Leader: P. G. Baker 7th - 9th May 1976

Friday evening The base for the excursion was at Gloucester, approximately 30 members arriving at the headquarters hotel during the evening. After dinner, the leader gave a short illustrated introductory talk on the geology and tectonic history of the area and outlined the itinerary for the weekend.

Saturday The day dawned sunny and the party, swelled by several members staying locally, assembled at the outlier (text-fig. 1) of Robins Wood Hill (SO 834148) Tuffley, on the outskirts of Gloucester. This abandoned brickpit, now an S. S. S. I. and rapidly deteriorating, still affords a reasonable exposure of the top of the Lower Lias (Davoei Zone) and the Middle Lias. The succession, in two workings, shows mainly grey clays and shales with nodule and ferruginous bands, the most prominent of which, the Spinatum Sandstone, dominates the upper working. The lower face was formerly much less obscured and a detailed account of the full succession exposed there may be found in Ager (1956). Material from the ferruginous horizons, unwanted by the quarrymen, was dumped in a tip on the east side of the pit. This tip provided excellent collecting facilities, yielding bivalves, *Pentacrinites* columnals, belemnites and small *Androgynoceras*.

From Gloucester, the party proceeded along the A417 in a south-easterly direction and climbed the Cotswold scarp to Birdlip. Here, after negotiating the rather steep slope up to the exposure, members were able to examine a section in the old Knap House Quarry (SO 925147) showing Upper Trigonia Grit (marking the base of the Upper Bajocian Transgression) resting on eroded Upper Freestone (text-fig. 3D) in the core of the intra-Bajocian, Birdlip anticline (text-fig. 1).

Proceeding northwards along the top of the scarp at Barrow Wake the party was disappointed to find the fine view across the Vale of Gloucester somewhat obscured by heat haze. The next stop was at the small, very overgrown but equally important S. S. S. I. (SO 933158) near the "Air Balloon" inn. Here, Upper Trigonia Grit was again seen but now resting on Middle Bajocian (Middle Inferior Oolite) deposits, higher stratigraphically (text-fig. 2, 3C) than those at Birdlip just under one mile to the south. Leaving this exposure, the party then proceeded on foot to a point 350 m. to the north-west where the base of the road section (SO 932160) up Crickley Hill was examined. At this point, just back from the road, 0.8 m of unfossiliferous black shales of Upper Lias age were seen, overlain by ferruginous calcisiltite and rubbly limestone of the basal Scissum Beds (text-fig. 2). The route up the hill, towards the "Air Balloon" and very welcome lunchtime refreshment, lay through Lower Inferior Oolite strata and members of the party were able to collect fine specimens of algal pisolite from the Pea Grit. A comprehensive account of this section may be found in Ager (1969).

After lunch the party proceeded further northwards via the B4070 to the shallow working known as Hartley Hill Quarry (SO 951181). A small vertical face runs (on the east side of what is now arable land) northwards to Charlton Kings Common (SO 952185). This section shows Upper Trigonia Grit resting on a bored, oyster encrusted erosion surface in Notgrove Freestone (text-fig. 3B). The party, on foot, embarked on a circular tour of the area. A vantage point above Charlton Kings enabled members to admire the view northwards across Cheltenham and beyond. The party then proceeded westwards, pausing to consider the significance of a small old working (SO 950185) exposing 1.2 m of Gryphite Grit with its characteristic *Gryphaea sublobata* Deshayes, overlying 2.4 m of Buckmani Grit. The floor of this old working marks the top of the underlying Lower Trigonia Grit from whence may be obtained the coral *Thecosmilia gregaria* (M'Coy). The presence of these deposits at a slightly lower level than the Notgrove Freestone shows that the Middle Bajocian succession is thickening again as one moves northwards, away from the Birdlip anticline towards the Cleeve Hill syncline. The route continued westwards towards the famous landmark of the Devil's Chimney (SO 946184)

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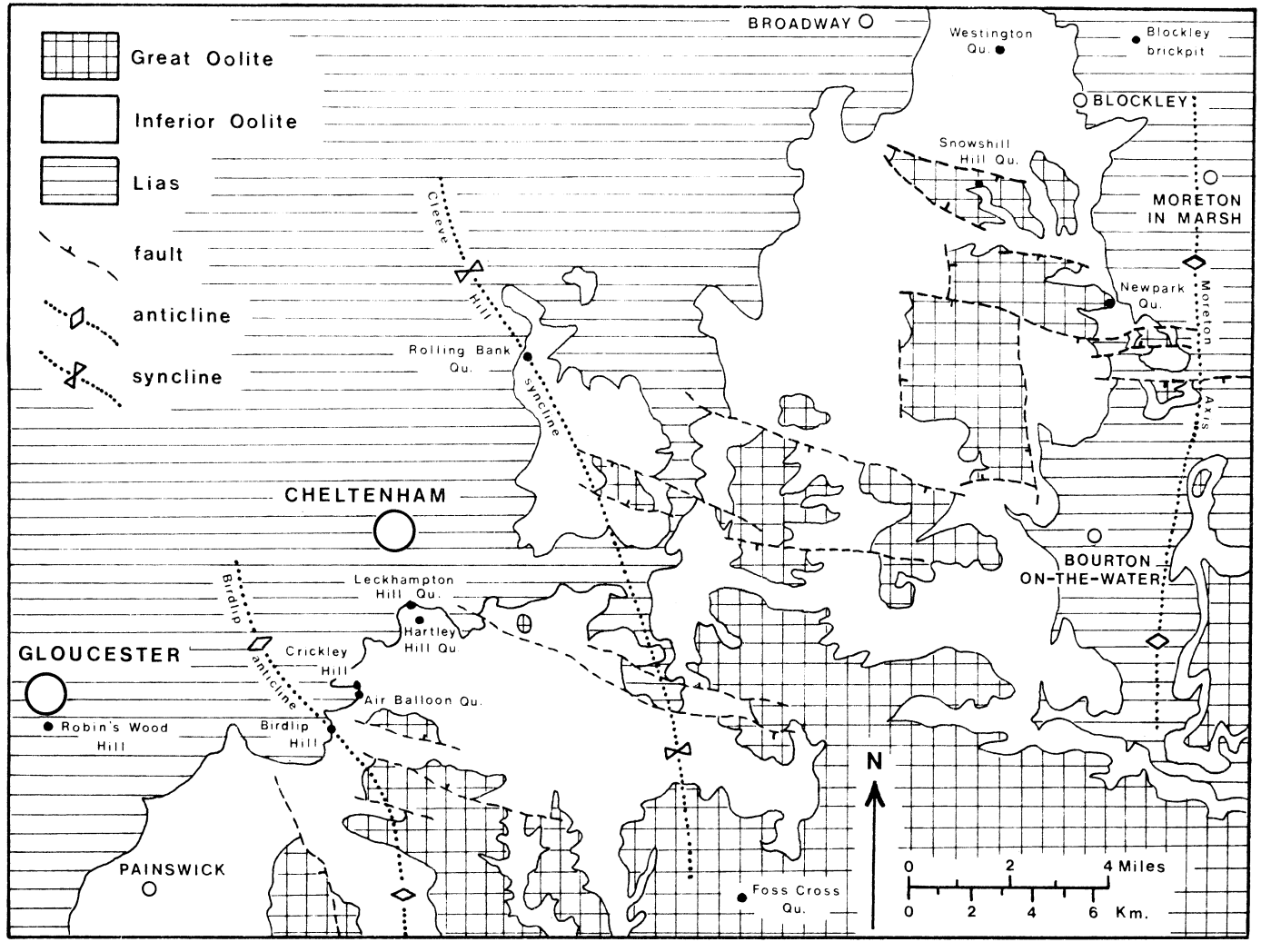


Text-figure 1. Geological map of the area showing the generalised outcrop of the main lithostratigraphical divisions and position of tectonic axes. Only the faults which significantly affect outcrop are included.

source of much local legend but in fact, nothing more exotic than a legacy of ancient quarrying activity. Adjacent to the Devil's Chimney members of the party were able to collect the characteristic fimbriate terebratulide *Plectothyris fimbria* (J. Sowerby) from an easily accessible exposure of Oolite Marl. The party then proceeded via the classic Leckampton Quarry (SO 949186) (Ager 1969) pausing to compare the Scissum Beds with those seen at Crickley Hill and then moving on to a small quarry (SO 953187) excavated entirely in a slumped mass of Upper and Lower Freestone at the western end of Charlton Kings Common. By now the circuit was almost closed and the party had only to climb diagonally, collecting fossils on the way, to reach the top of the Common and the route back to the transport. By now the heat was becoming oppressive but it did enable the leader to demonstrate that the "Beware of Adders" signs were no idle warning as several of these attractive little snakes, resplendent in their Spring russet-brown and black markings, were seen gliding out of the path of the heavy boots of the leading members of the party.

Time was now short and the well-known Rolling Bank Quarry (SO 987266) where the Upper Trigonia Grit can be seen resting on a bored erosion surface in the Phillipsiana Beds (text-fig. 2, 3A) in the trough of the Cleeve Hill syncline (Richardson 1929, p. 52) was not visited. Instead, Salterley Grange Quarry (SO 946177) in Lower Freestone, at the southern end of Leckhampton Hill was visited and members were able to speculate on the true nature of three small faults visible in the quarry face.

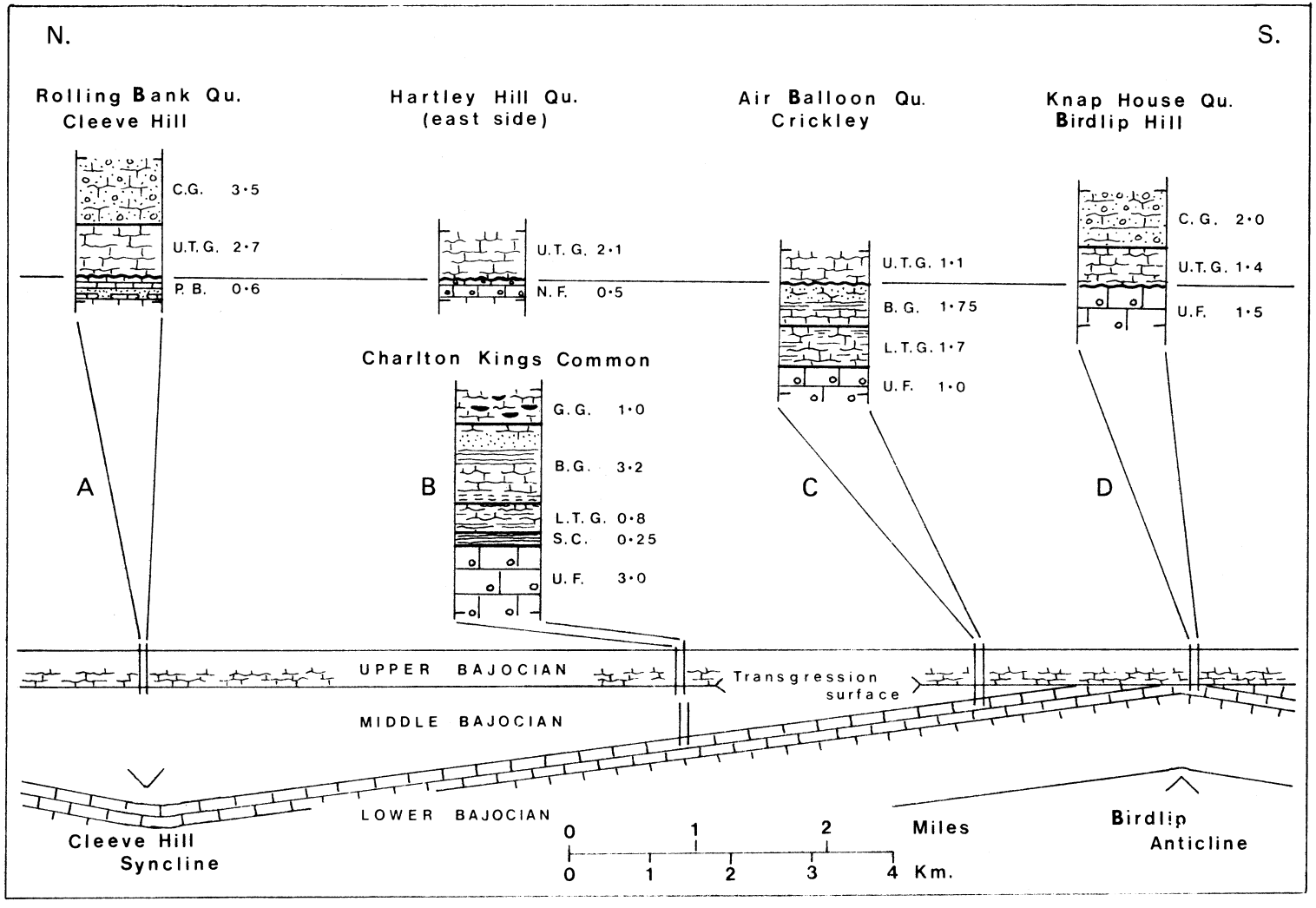
Sunday The party set off in a south-easterly direction following the Ermine Way (A417) towards Cirencester. Turning left at Daglingworth cross-roads, the party passed through North Cerney and eventually, three quarters of a mile east of Calmsden, arrived at Foss Cross Quarry (SP 055092) to compare the shallow water Bathonian sedimentation with the Bajocian deposits already seen. The quarry exposes about 8.5 m of marls and limestones belonging to the White Limestone Series. The quarry was a large one and interesting for the rapid lithological variation of the beds around the face. Prior to becoming an S. S. S. I. it was used as a refuse tip by Gloucestershire County Council. However, the north-west face is largely untouched and the general succession is shown in text-fig. 4. One of the most spectacular fossils when the quarry was in work, was a deep pink (hence "Beetroot Stone") alga *Solenopora jurassica* Nicholson. Unfortunately the source of the darkest specimens appears to be exhausted but representative specimens may still be obtained from fallen blocks on the quarry floor, approximately half way along the face. Other fossils still reasonably plentiful are the brachiopods *Epithyris oxonica* Arkell and *Digonella digonoides* (S. S. Buckman).

From Foss Cross the party travelled north-eastwards up the Fosse Way to Stow-on-the-Wold and then up the A424 to Newpark Quarry (SP 175284) near Longborough. The quarry shows about 5.0 m of Chipping Norton Limestone, thin-bedded in the upper half and more nodular in the lower half. Belemnite and *Ostrea* fragments were obtained from the nodular beds, which consist of nodules of very hard grey sparry biomicrite in a matrix of light brown-grey silty biomicrite. The leader had previously obtained part of a *Teleosaurus* scute from this horizon and while the majority of the party retired to the nearby "Coach and Horses" for lunch, the lure of vertebrate remains kept some members hammering and one of these was rewarded with a fragment some 10.0 cms. in length, possibly a fragment of a mandible of *Steneosaurus* sp.

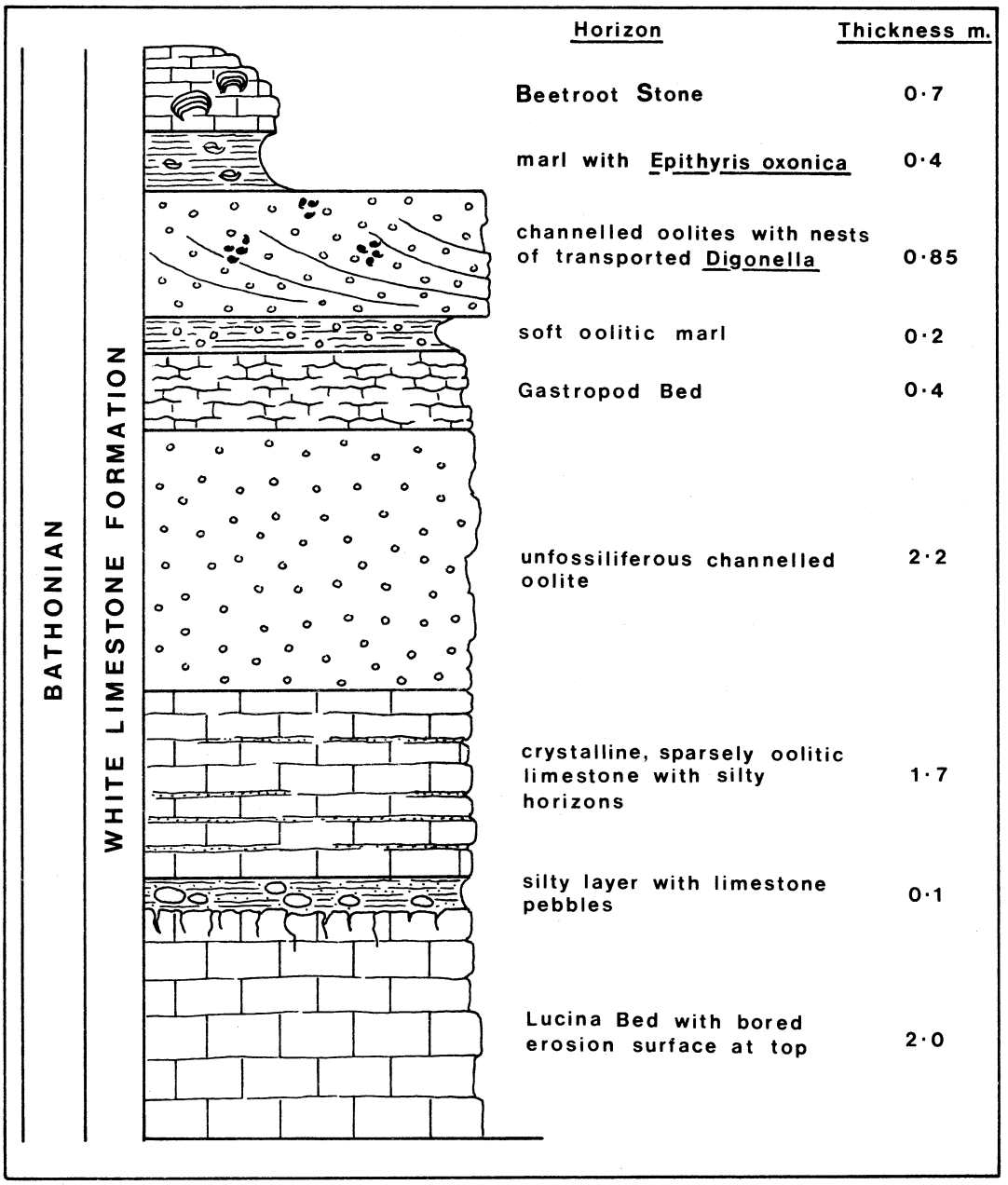
After lunch the party resumed its northward course up the A424 and then via a minor road to Snowshill Hill Quarry (SP 131322) to compare the much thinner Chipping Norton Limestone with that of the previous locality, and to collect corals from the rich fauna of the "Coral Bed" of the Sharps Hill Beds. The strata exposed in the quarry are shown in text-fig. 5. The Coral Bed owes its name to the abundance of a reptoid coral *Microsolena excelsa* Edwards and Haime set in a blue-grey clay matrix. Also collected were *Cyathophora pratti* Edwards & Haime, *Isastraea limitata* (Lamouroux) and *Thamnasteria lyelli* (Edwards and Haime). Attention was drawn to the epifauna on these corals and to the very numerous *Lithophaga* borings in them, indicative of a distinct pause in sedimentation at this horizon. In addition to corals, brachiopods, *Kallirhynchia* sp. (crushed) and *Epithyris* sp., together with bivalves, *Modiolus* sp. and *Liostrea* sp. were obtained. Weathered out from the Nerinea

STAGE	ZONE	LITHOSTRATIGRAPHICAL DIVISION	DOMINANT LITHOLOGY	Max. Th. m.
UPPER BAJOCIAN	PARKINSONI	CLYPEUS GRIT	pale brown, rubbly, irregularly bedded oomicrite and biomicrite	12·0
	GARANTIANA	UPPER TRIGONIA GRIT	irregularly bedded bioclastic calcarenite	3·0
MIDDLE BAJOCIAN	SOWERBYI	PHILLIPSIANA BEDS	hard, splintery, grey, sparry limestone with sand pockets	3·2
		BOURGUETIA BEDS	well bedded bioclastic limestones	4·3
		WITCHELLIA GRIT	ferruginous calcarenite	1·0
		NOTGROVE FREESTONE	pale grey oosparite	7·6
		GRYPHITE GRIT	bioclastic calcarenite	2·6
		BUCKMANI GRIT	yellowish bioclastic calcarenite with sand and marl bands	5·5
		LOWER TRIGONIA GRIT	rubbly bioclastic calcarenite	2·1
LOWER BAJOCIAN (= AALENIAN)	CONCAVUM	TILESTONE	fissile calcisiltite interbedded with sands	5·6
		SNOWSHILL CLAY	laminated brown or black clay	4·8
		HARFORD SANDS	yellow sands	2·8
	MURCHISONAE	UPPER FREESTONE	well bedded bioclastic oomicrite	7·1
		OOLITE MARL	rubbly oolitic biomicrite and marls	3·9
		LOWER FREESTONE	white to cream, evenly bedded oomicrite and oosparite, often strongly current bedded	40·0
		PEA GRIT	unevenly bedded, fine to coarse algal pisolite	11·0
		LOWER LIMESTONE	bioturbated oomicrite, thick-bedded, with bioclastic horizons	11·0
	SCISSUM	SCISSUM BEDS	ferruginous bioclastic calcisiltite with marl bands	10·0

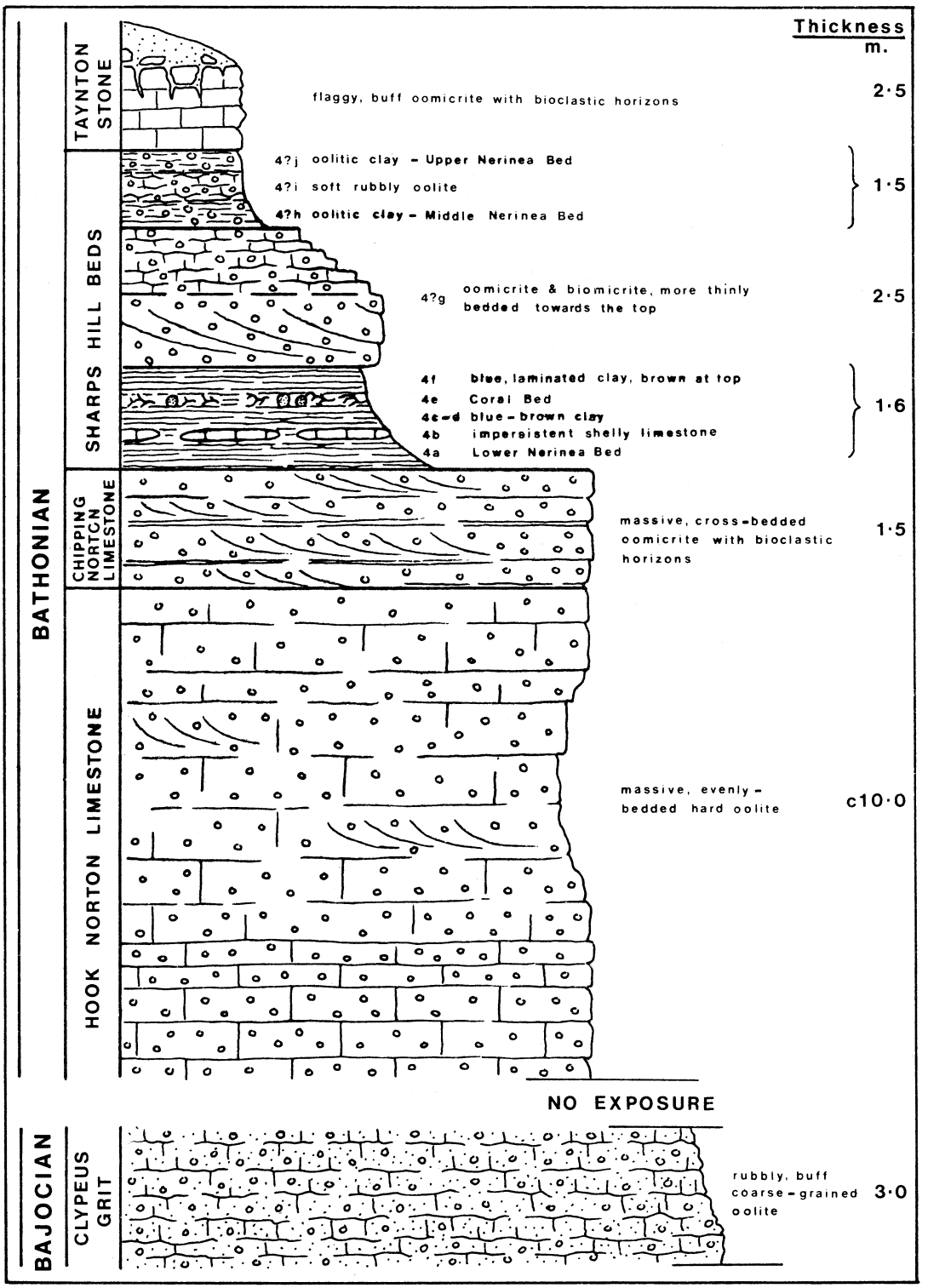
Text-figure 2. Diagram to show the lithostratigraphical divisions and dominant lithologies of the Inferior Oolite of the Cotswold area.



Text-fig. 3. Diagram to show the transgressive nature of the Upper Trigonia Grit between Birdlip and Cleeve Hill. Horizon identification as in text-fig. 2. Thickness of strata shown in metres.



Text-figure 4. Generalised section, showing the major lithological units exposed in Foss Cross Quarry (N.W. face).



Text-figure 5. Generalised section, showing the major lithological units exposed in Snowshill Hill Quarry.

Beds and accumulating on the floor of the upper working (surface of Chipping Norton Limestone) were numerous gastropods of *Aphanoptyxis* spp., *Neridomus* sp. and a few *Natica* sp. A detailed account of the fauna of the Sharps Hill Beds may be found in Barker (1969).

Rejoining the main road the northward trend continued up the A44 and B4081 to Westington Hill Quarry (SP 139367). The geology of this quarry is published in Baker (1974) and nothing further need be added except that re-working of the quarry has exposed new sections through the very fossiliferous Oolite Marl.

The excursion ended stratigraphically where it had begun - in the Lias. The final visit was to the Lower Lias locality in the Ibex Zone near Blockley Station (SP 182369). This section, famous for its fossils, particularly ammonites, is so well documented (Callomon 1968 p. 202) that no further description is required here. The many ammonites except for fragments of *Liparoceras* sp. and *Lytoceras* sp. were not in evidence but members were able to collect abundant specimens of belemnites and bivalves *Pleuromya costata* (Young & Bird). *Mactromya cardioides* (Phillips), *Pholadomya* sp., *Gryphaea* sp. and *Chlamys* (*Aequipecten*)*prisca* (Schloetheim) from the Pecten Bed.

Conservation Note: S. S. S. I. indicates that the locality has been designated a "Site of Special Scientific Interest" and casual collecting, except from loose material is prohibited.

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