Figures and tables

Figures

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(Figure 1.3) Global reconstructions showing the changing palaeogeography of the Avalonian microcontinent from the late Precambrian through to the late Silurian, modified from Dalziel (1997). Models of this type are geologically constrained where possible but the details may change, as more information becomes available. (a) Reconstruction of the Pannotia supercontinent, showing its main components, towards the end of activity of the Avalonian volcanic arc and prior to the Cambrian overstep sequence (Figure 1.2). (b) Conjectural position of Avalonia at the time of the Arenig overstep sequence in England and Wales, and following rifting and the breakup of Pannotia. (c) Situation just before the Acadian deformation, caused by collision when the converging microcontinent of Armorica impinged against Avalonia. Note that Avalonia had earlier 'docked' with Baltica in latest Ordovician time. It was to encroach upon Laurentia in the earliest Silurian, along the line of the Iapetus suture, which is located between the English Lake District and the Southern Uplands of Scotland.

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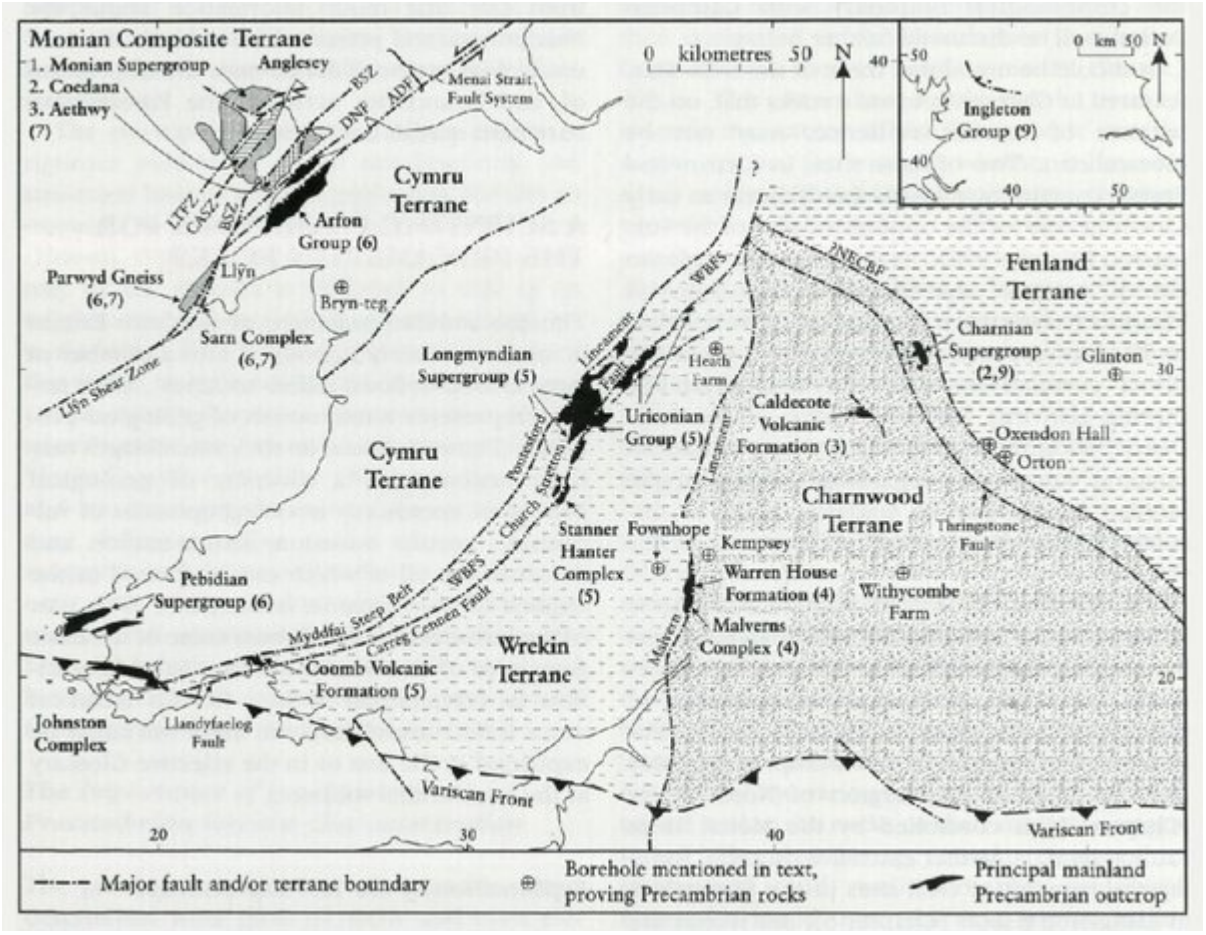
(Figure 9.7) Thornton Force showing the sub-Carboniferous unconformity in the overhang beneath Carboniferous Limestone; weathered Ingleton Group siltstone crops out below the unconformity and around the margin of the plunge pool. (Photo: A7626, reproduced by kind permission of the Director, British Geological Survey, ©NERC.).

Tables

(Table 1) A simplified comparative grain-size and grain-compositional chart for sedimentary, volcaniclastic and igneous rock types. The volcaniclastic rock classification is modified from Fisher (1961) and Fisher and Schmincke (1984).

References



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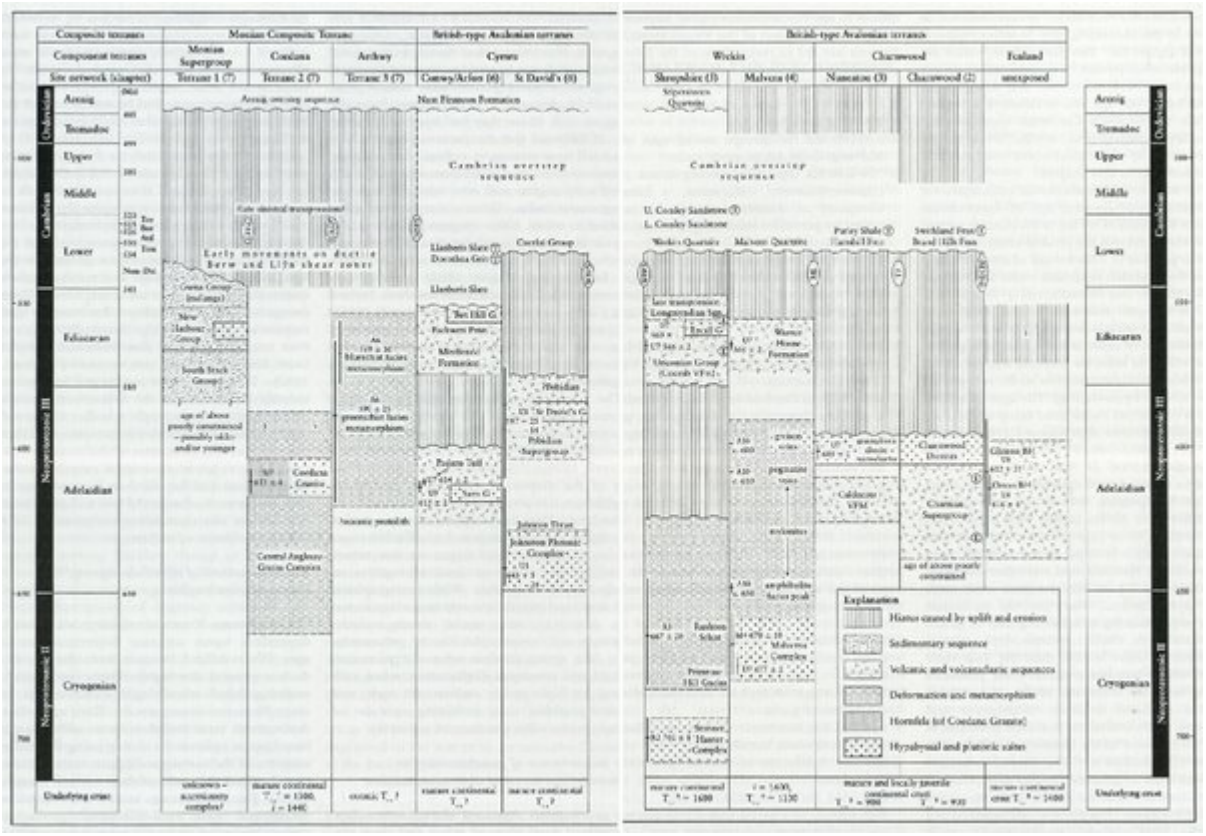

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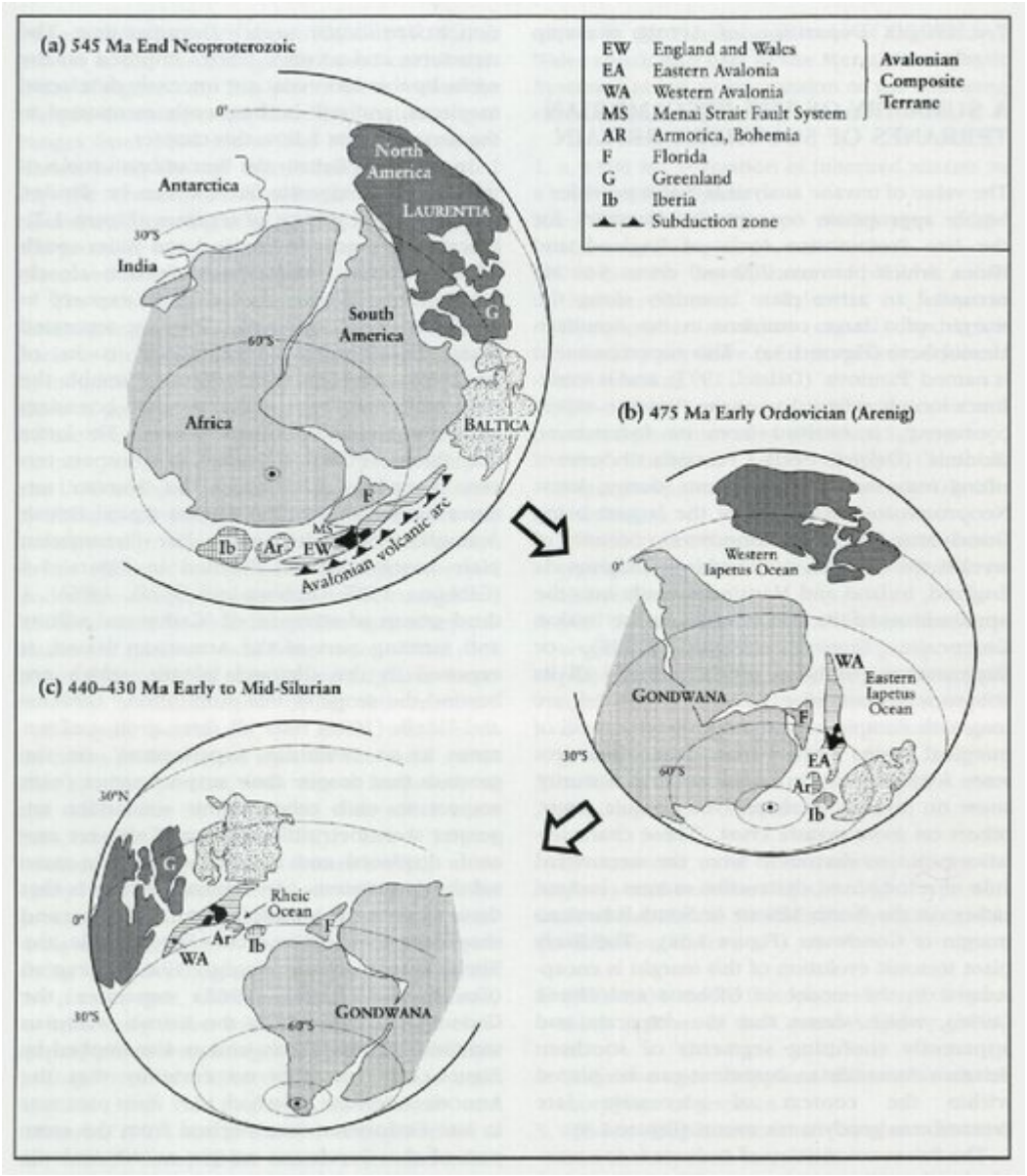
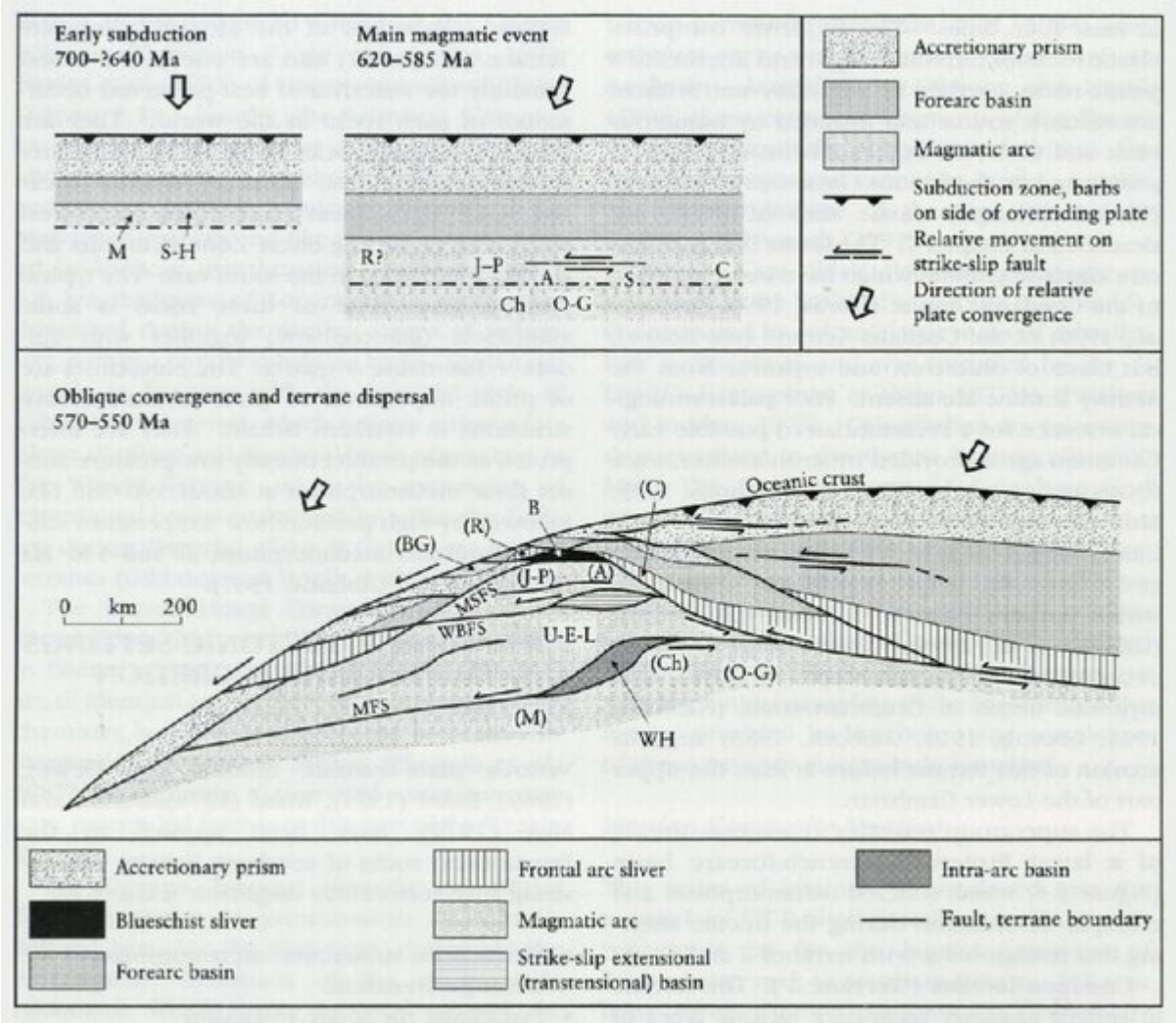
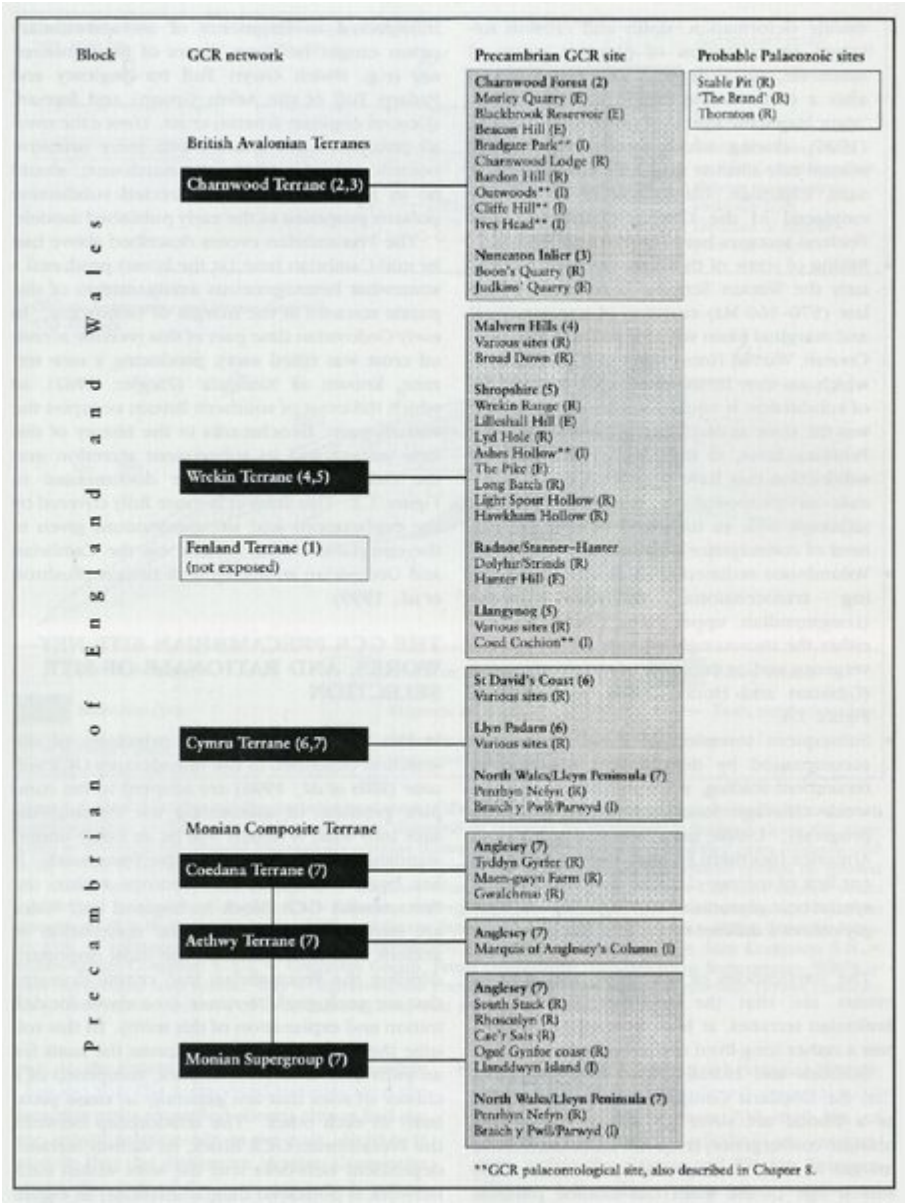


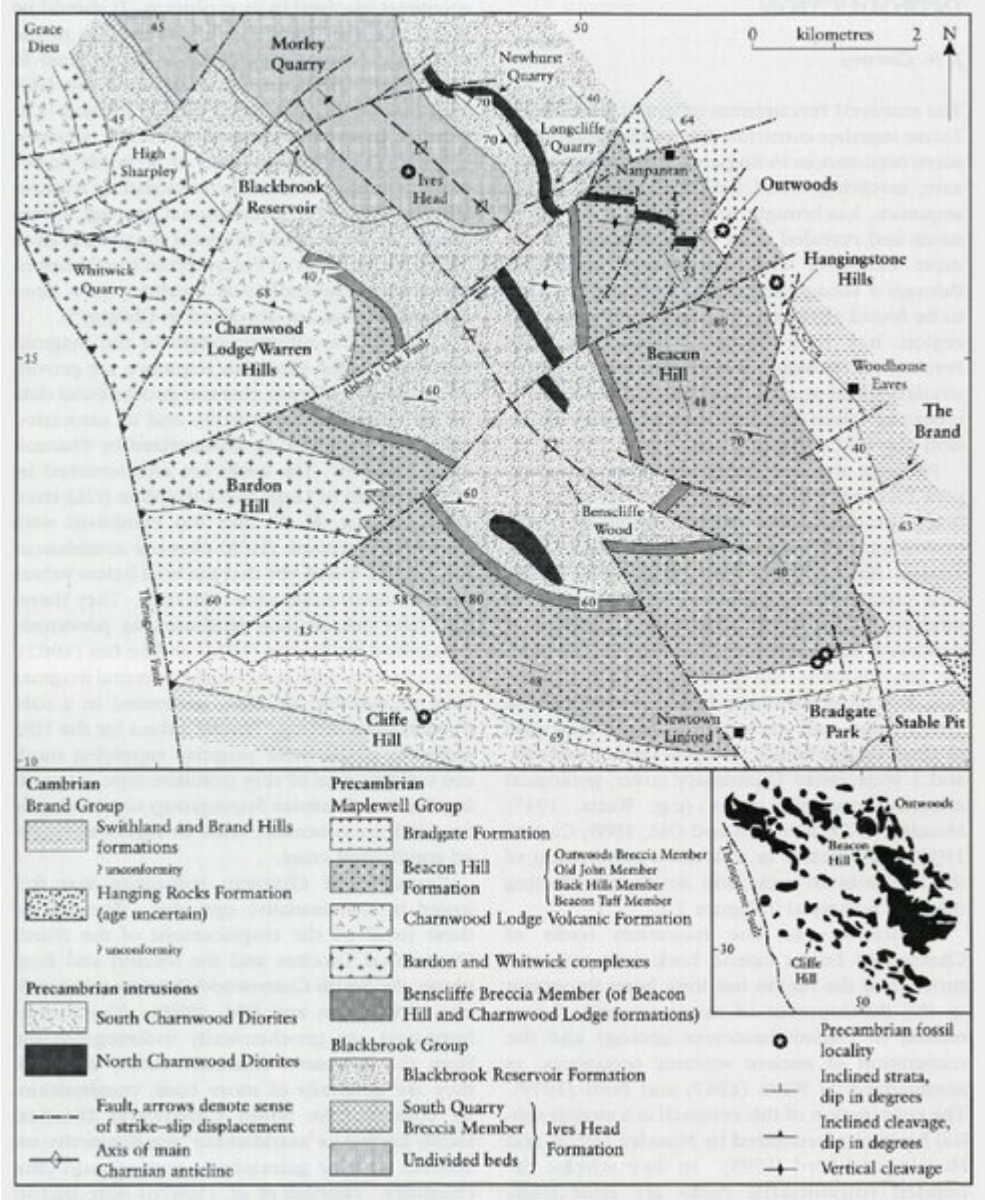
(Figure 1.3) Global reconstructions showing the changing palaeogeography of the Avalonian microcontinent from the late Precambrian through to the late Silurian, modified from Dalziel (1997). Models of this type are geologically constrained where possible but the details may change, as more information becomes available. (a) Reconstruction of the Pannotia supercontinent, showing its main components, towards the end of activity of the Avalonian volcanic arc and prior to the Cambrian overstep sequence (Figure 1.2). (b) Conjectural position of Avalonia at the time of the Arenig overstep sequence in England and Wales, and following rifting and the breakup of Pannotia. (c) Situation just before the Acadian deformation, caused by collision when the converging microcontinent of Armorica impinged against Avalonia. Note that Avalonia had earlier 'docked' with Baltica in latest Ordovician time. It was to encroach upon Laurentia in the earliest Silurian, along the line of the Iapetus suture, which is located between the English Lake District and the Southern Uplands of Scotland.



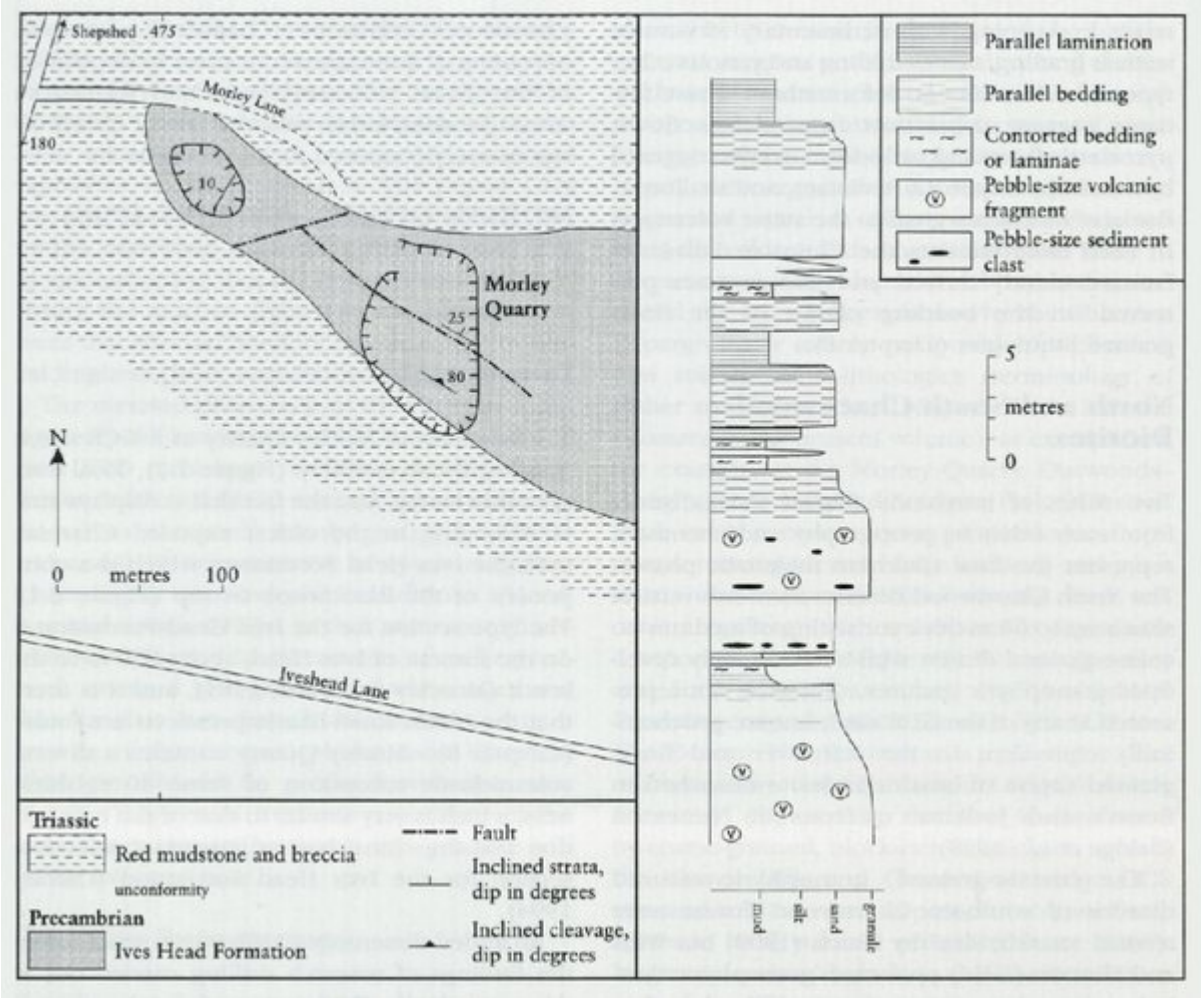
(Figure 1.4) Model for the late Precambrian evolution of the Avalonian subduction system: episodic Precambrian magmatism (top two cartoons) followed by the dispersal of terranes by transcurrent faulting along the plate margin as convergence became increasingly oblique during the latest Precambrian (modified from Gibbons and Horik, 1996). Note that the presence of the Monian Composite Terrane within this system cannot be proved until Arenig time. A = Arfon Group; B = Anglesey blueschists; BG = Bwlch Gwyn Tuff and related strata (Anglesey); C = Coedana Complex; Ch = Charnian Supergroup; J-P = Johnston Plutonic Complex and Pebidian Supergroup; M = Malverns Complex; MFS = Malverns lineament or fault system; MSFS = Menai Strait fault system; O-G = volcanics in Orton and Glinton boreholes; R = Rosslare Complex; S = Sam Complex; S-H = Stanner-Hanter Complex; U-E-L = Uriconian Group, Ercall Granophyre, Longmyndian Supergroup; WBFS = Welsh Borderland fault system; WH = Warren House Formation. The same letters in brackets (lower cartoon) refer to the relative positions of those volcanic belts that were by then extinct.



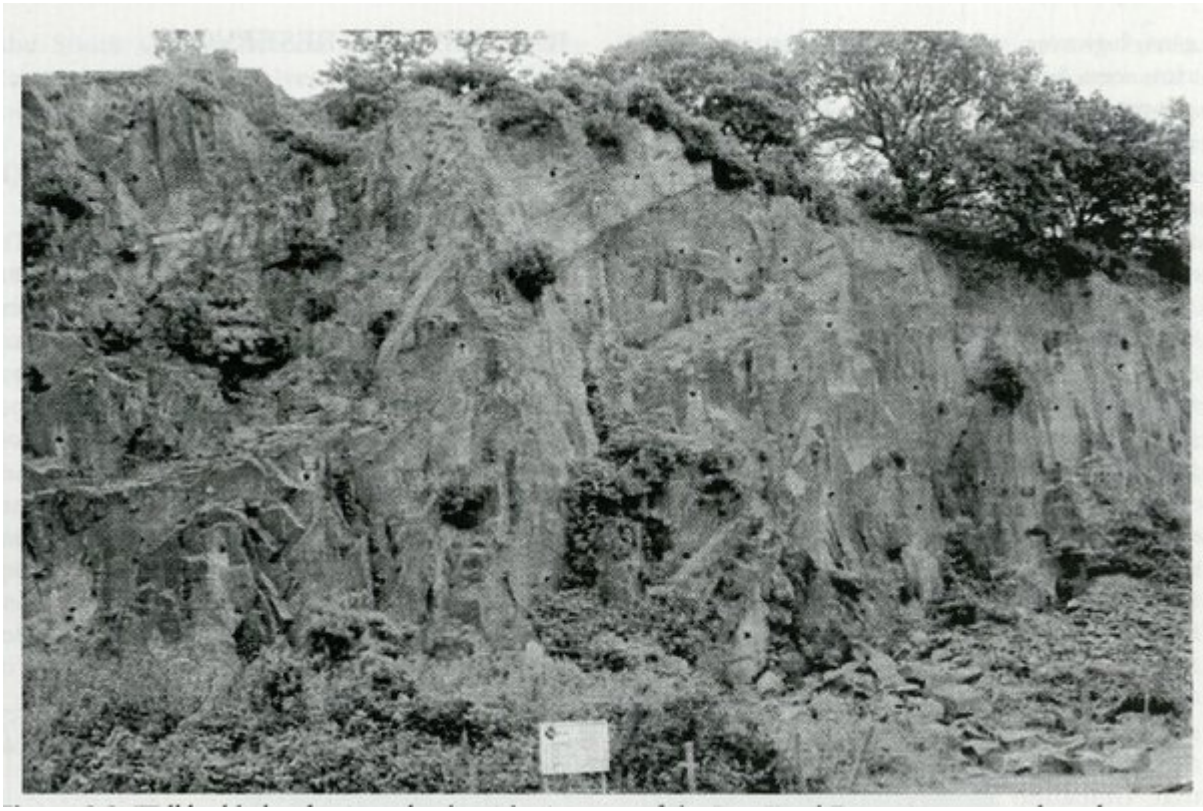
(Figure 1.5) Diagram showing the relationship between Precambrian terranes, GCR networks and site clusters. Figures in brackets refer to the relevant chapters in which the descriptions occur. Letters in brackets indicate the JNCC scientific 'ranking' of each site (see text for explanation). Note that sites with probable Palaeozoic rocks are treated outwith the main GCR site networks.



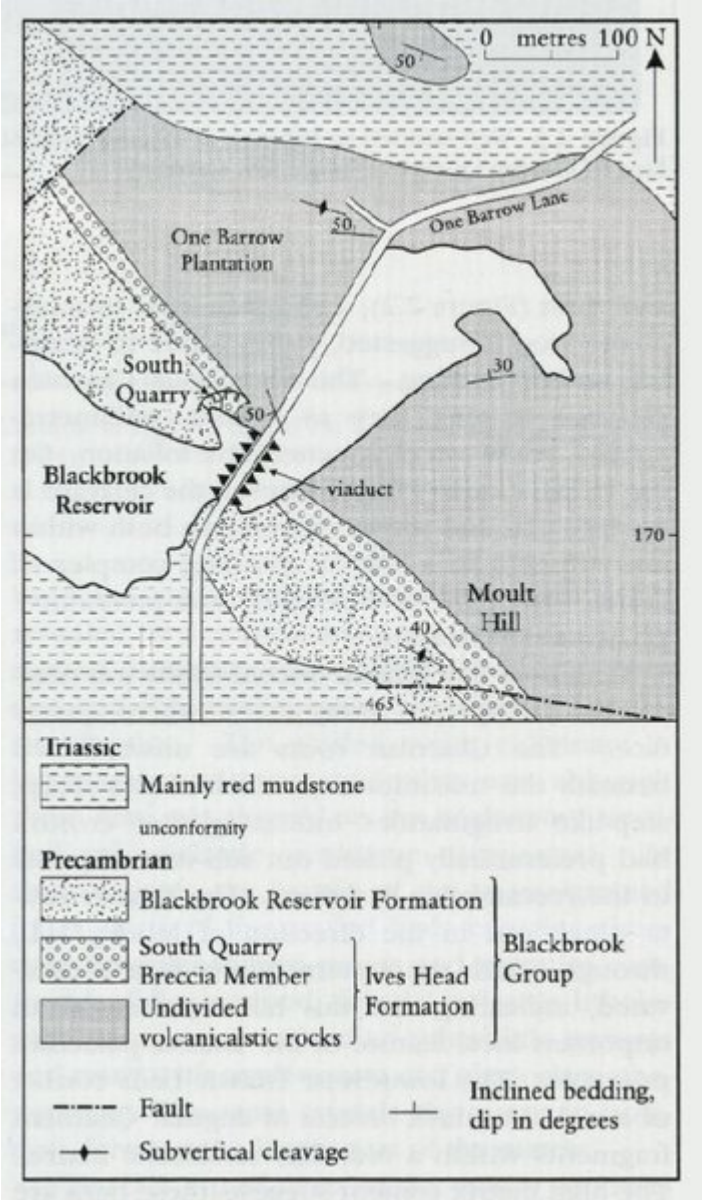
(Figure 2.1) Geological map of Precambrian and Cambrian rocks in Charnwood Forest, showing the locations of the GCR sites (in bold lettering). Note that younger rocks are omitted for clarity. The inset shows the actual extent of the 'basement' inliers (dark shading) between this younger cover. The latter mainly consists of Triassic strata, with Coal Measures included to the west of the Thringstone Fault; extensive veneers of Quaternary drift are also present (modified from Worssam and Old, 1988).



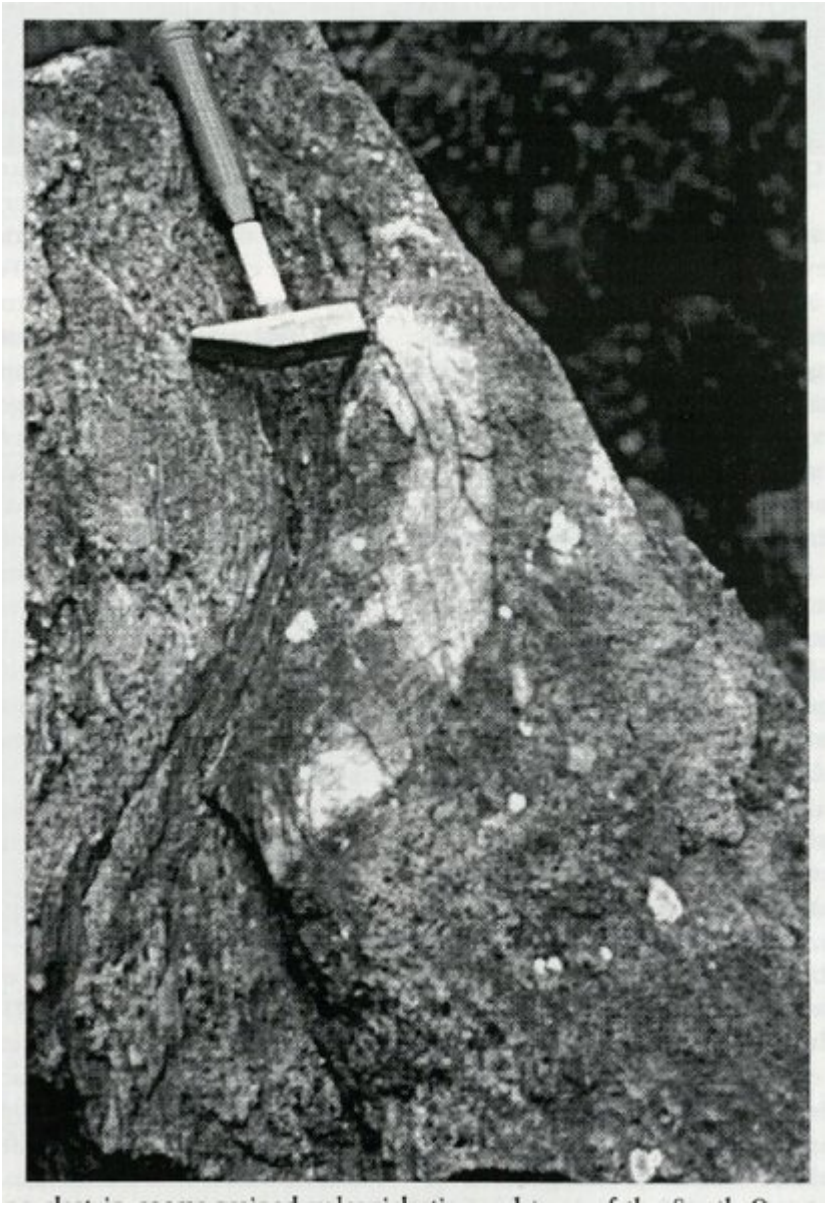
(Figure 2.2) Geological map of the Morley Quarry site. Column at right is based on a measured section of the beds exposed on the eastern face of the quarry (Carney, 1994).



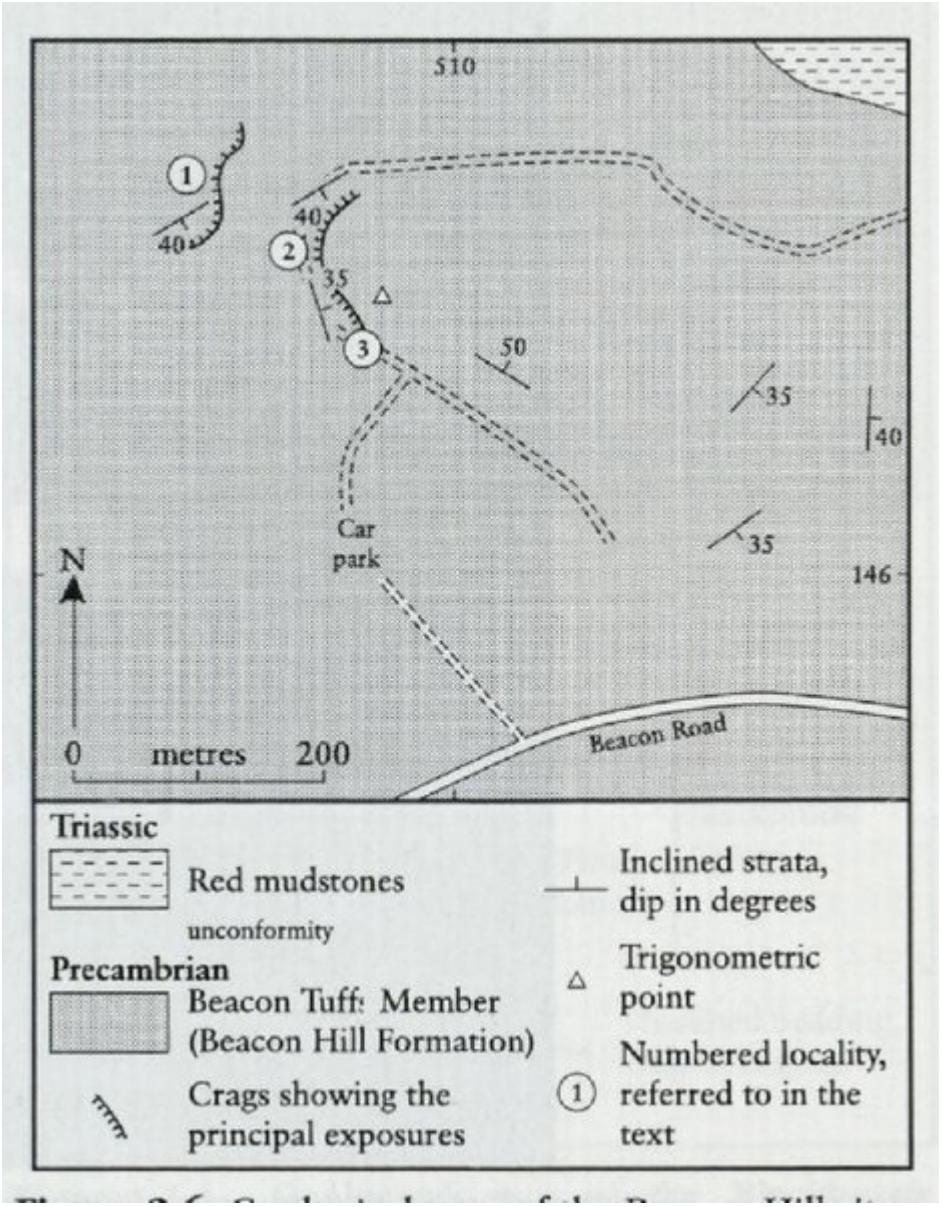
(Figure 2.3) Well-bedded to laminated volcaniclastic strata of the Ives Head Formation exposed on the eastern face of Morley Quarry (Photo: J.N. Carney.)



(Figure 2.4) Geological map of the Blackbrook Reservoir site.

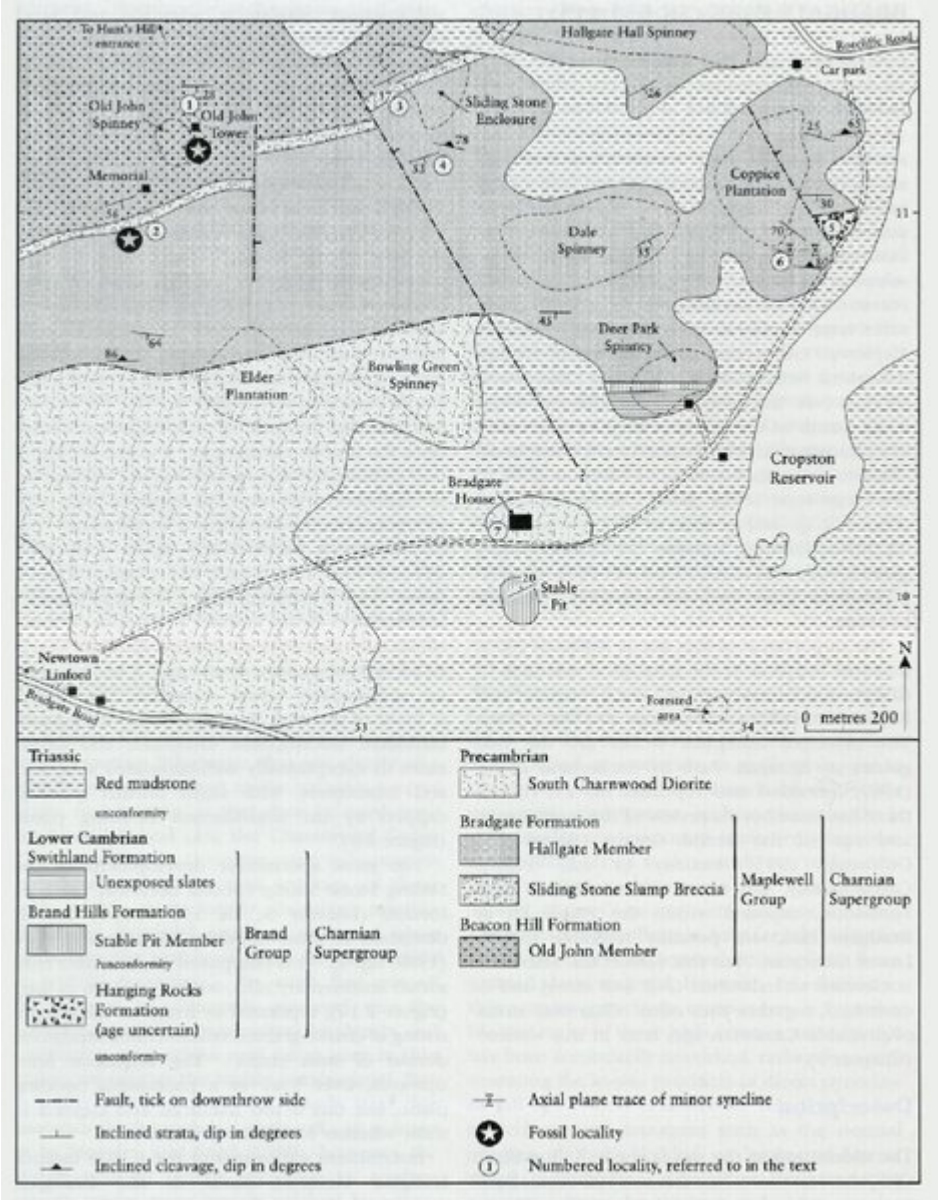


(Figure 2.5) Siltstone clast in coarse-grained volcaniclastic sandstone of the South Quarry Breccia Member, Blackbrook Reservoir. (Photo: J.N. Carney.)

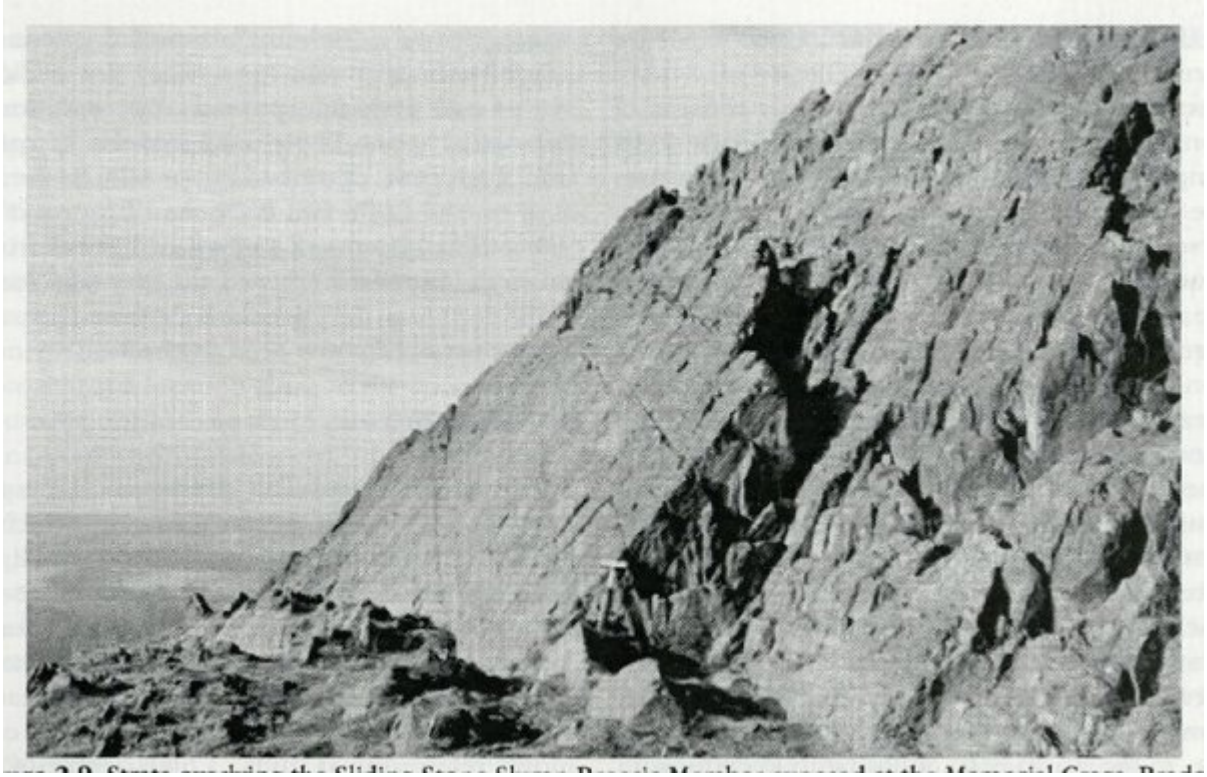


(Figure 2.6) Geological map of the Beacon Hill site.

(Figure 2.7) Exposure of fine-grained tuffaceous strata of the Beacon Tuffs Member, to the west of the trigonometric point at Beacon Hill. (Photo: J.N. Carney.)

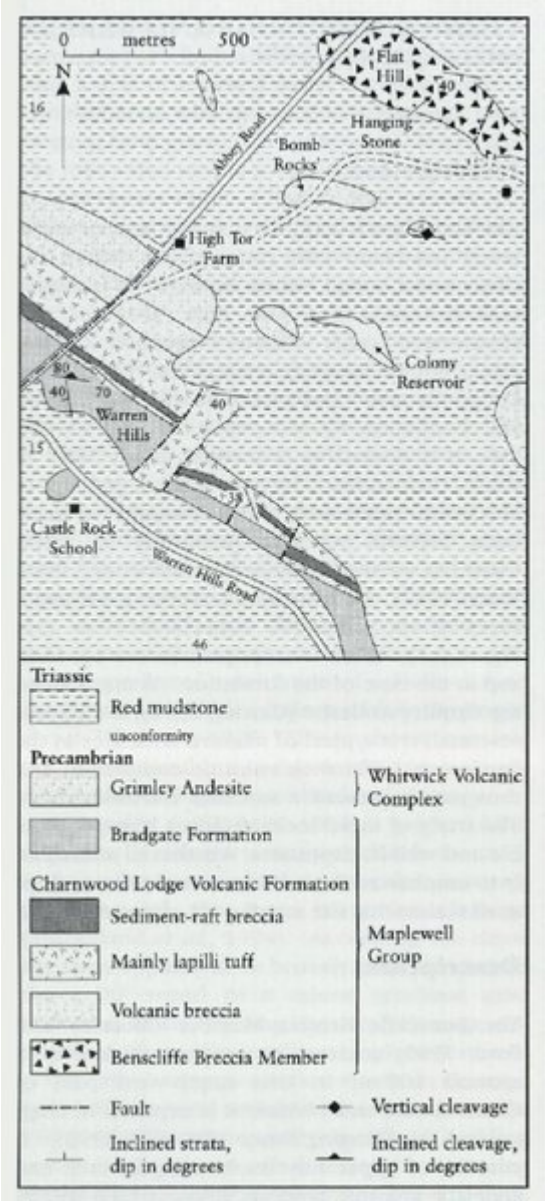


(Figure 2.8) Geological map of the Bradgate Park site, adapted from Sutherland et al., (1994) and Kelk and Old (1982).

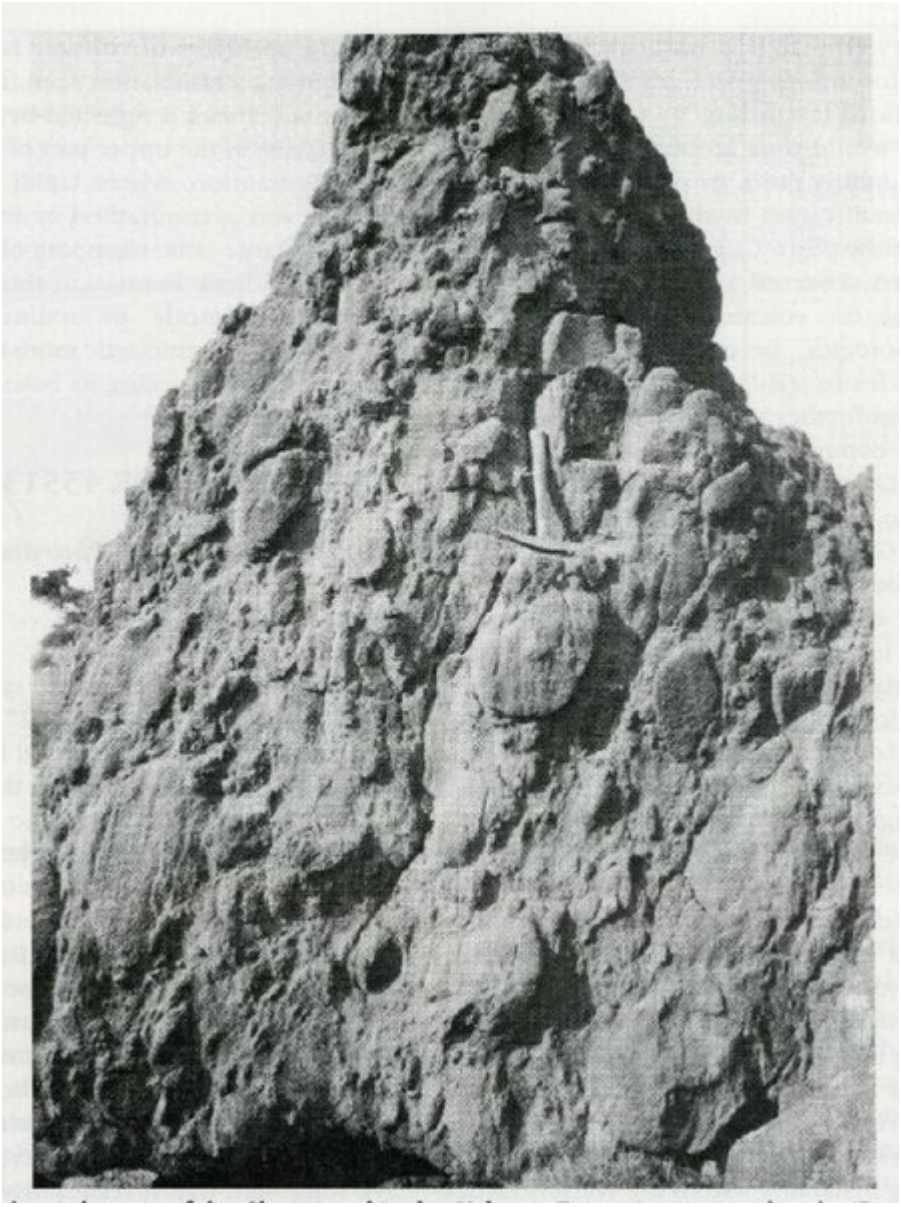


(Figure 2.9) Strata overlying the Sliding Stone Slump Breccia Member exposed at the Memorial Crags, Bradgate Park, showing the prominent bedding plane (to left) on which occur fossil impressions (see also, Chapter 8). (Photo: J.N. Carney)

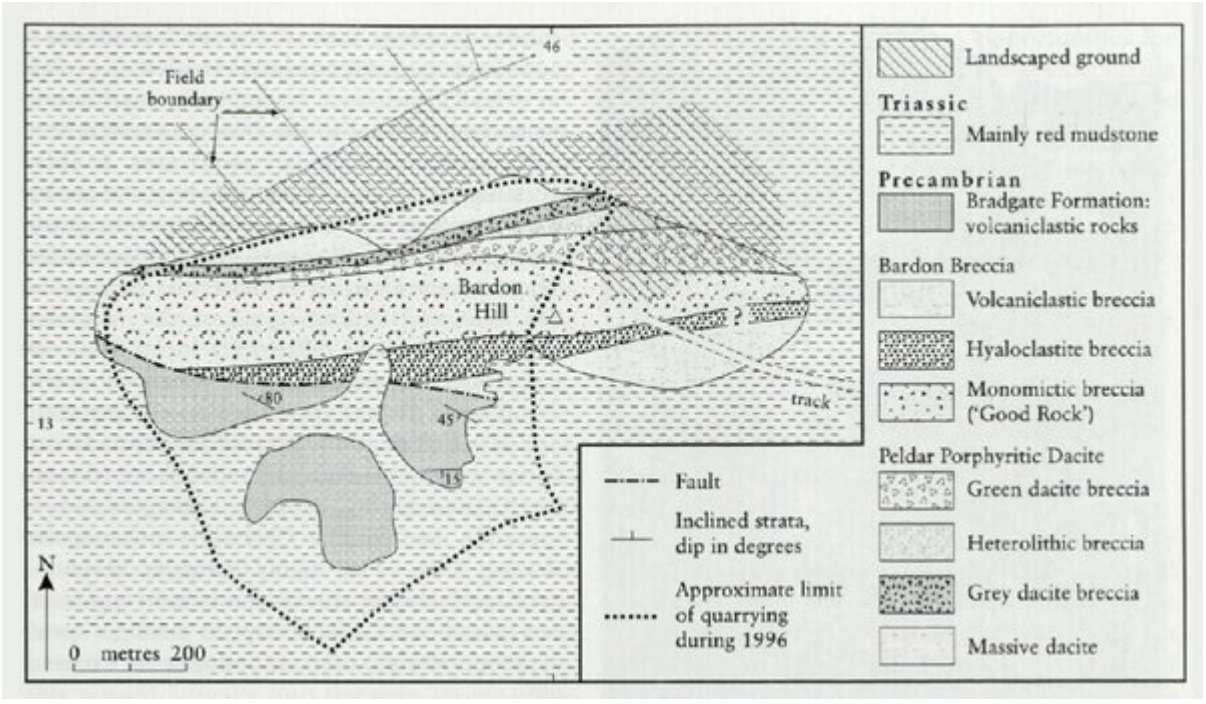
(Figure 2.10) Detail of the Sliding Stone Slump Breccia exposed near Sliding Stone Spinney, Bradgate Park, showing tight packing and chaotic orientation of laminated siltstone rafts. (Photo: J.N. Carney.)



(Figure 2.11) Geological map of the Charnwood Lodge and Warren Hills site.

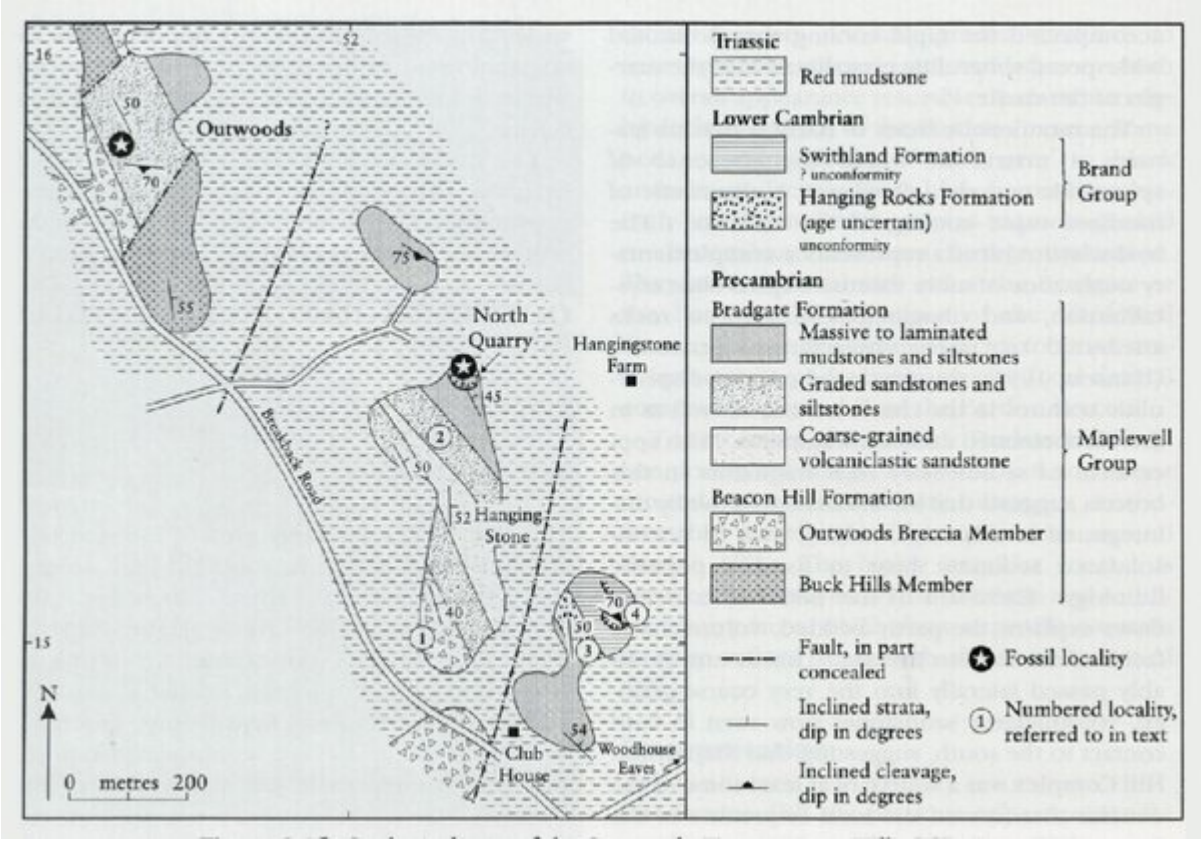


(Figure 2.12) Volcanic breccia of the Charnwood Lodge Volcanic Formation exposed at the 'Bomb Rocks' locality of Watts (1947), Charnwood Lodge Nature Reserve. (Photo: J.N. Carney.)

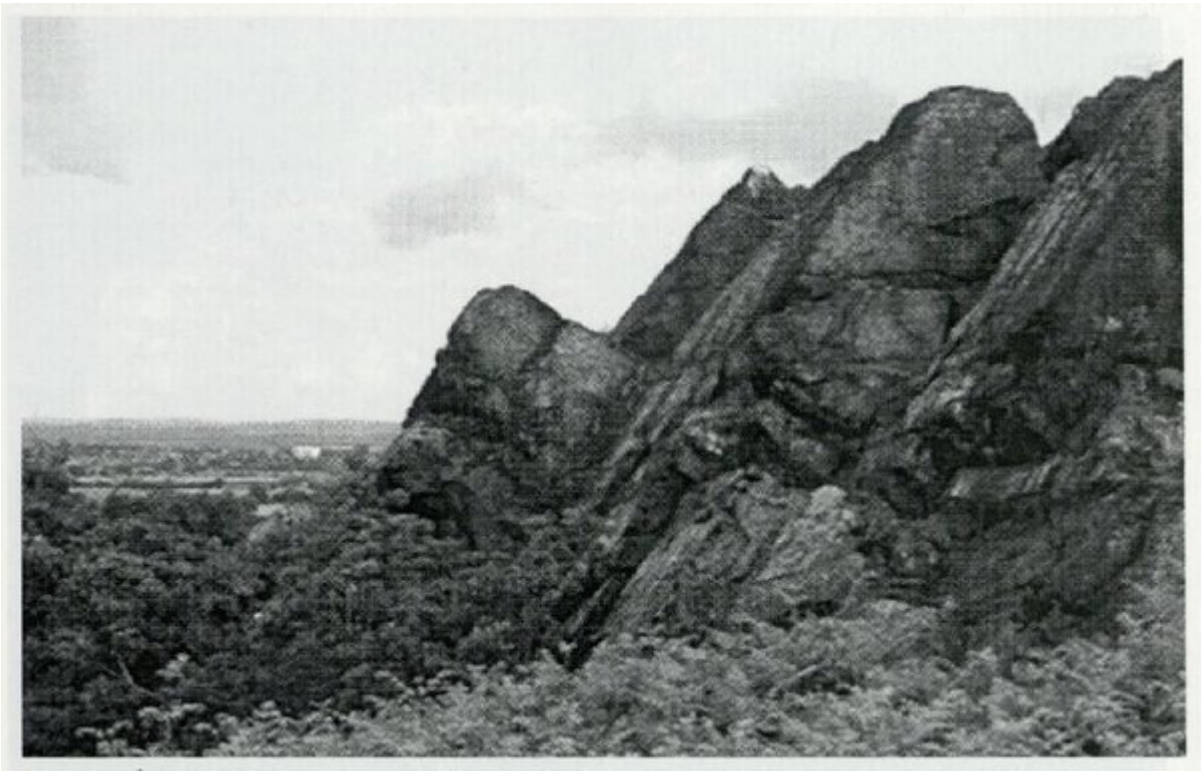


(Figure 2.13) Geological map of the Bardon Hill site

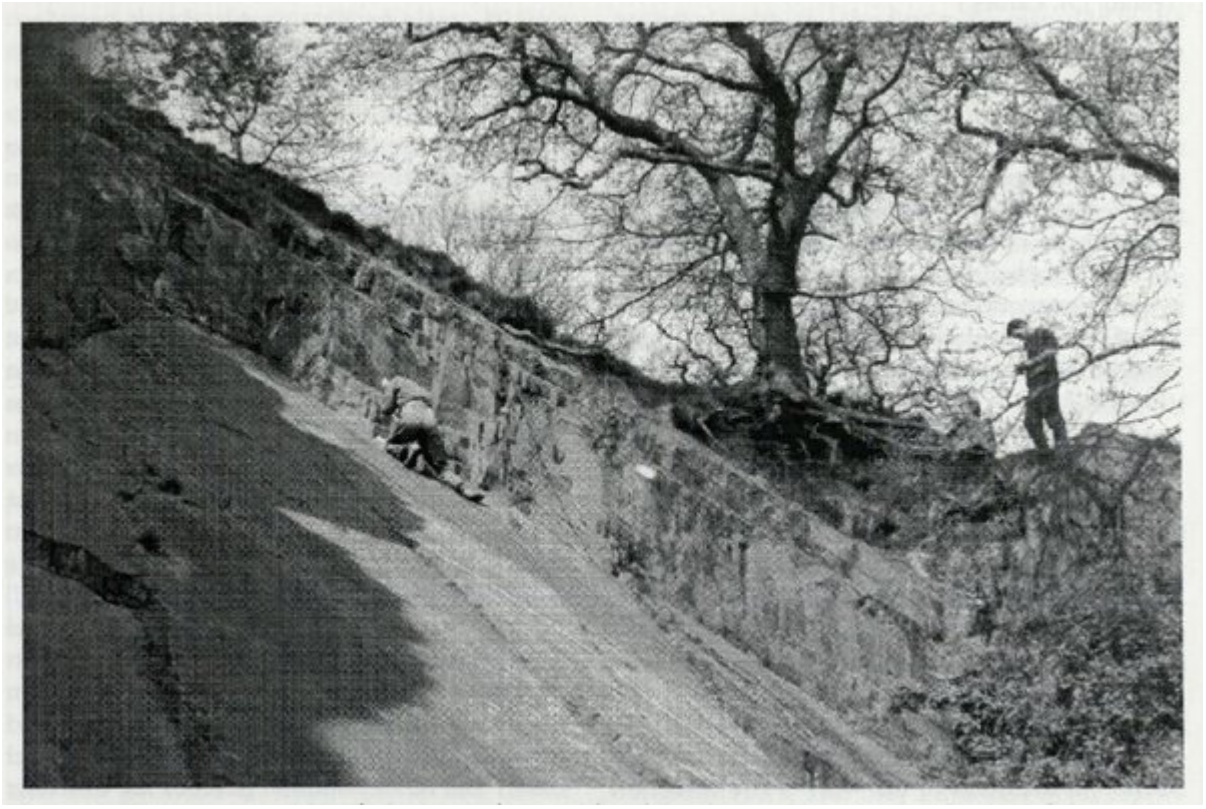
(Figure 2.14) Exposures near Bardon Hill summit, probably in the monomictic breccia facies of the Bardon Breccia. (Photo: J.N. Carney.)



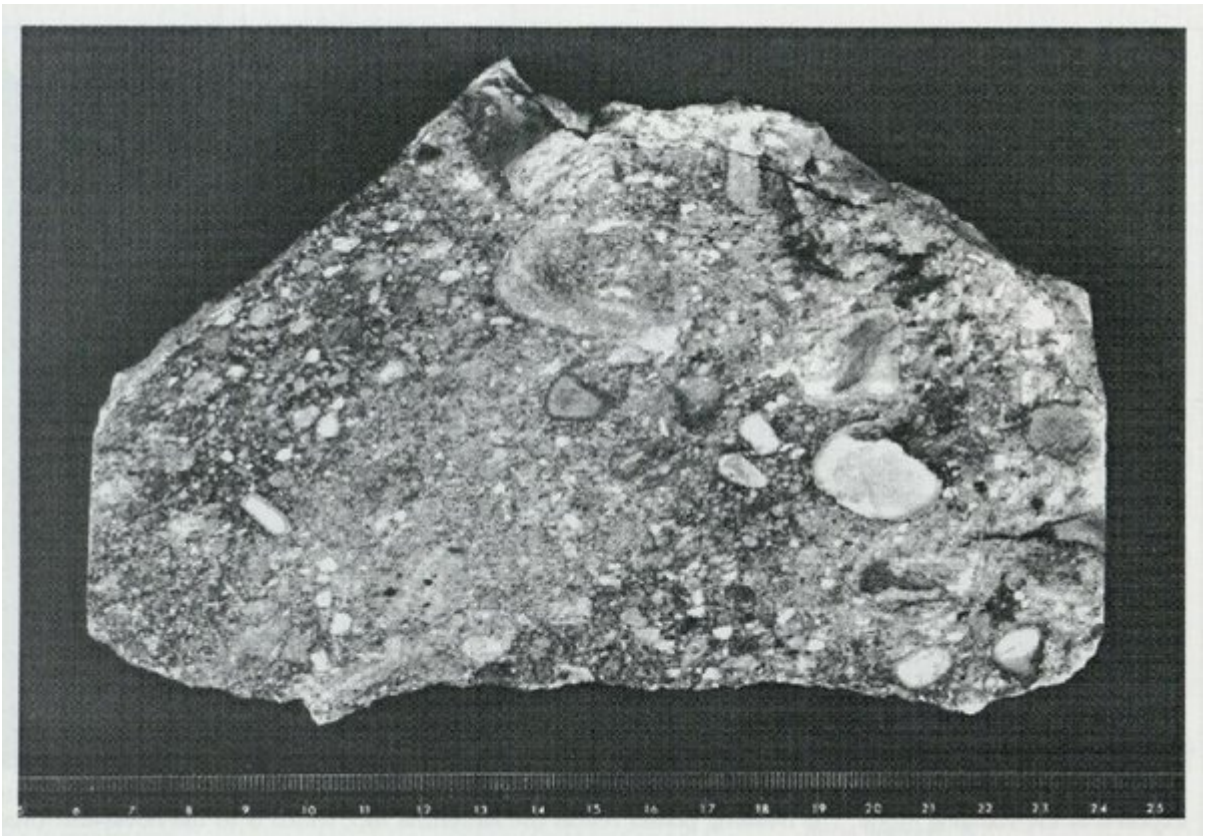
(Figure 2.15) Geological map of the Outwoods–Hangingstone Hills GCR site



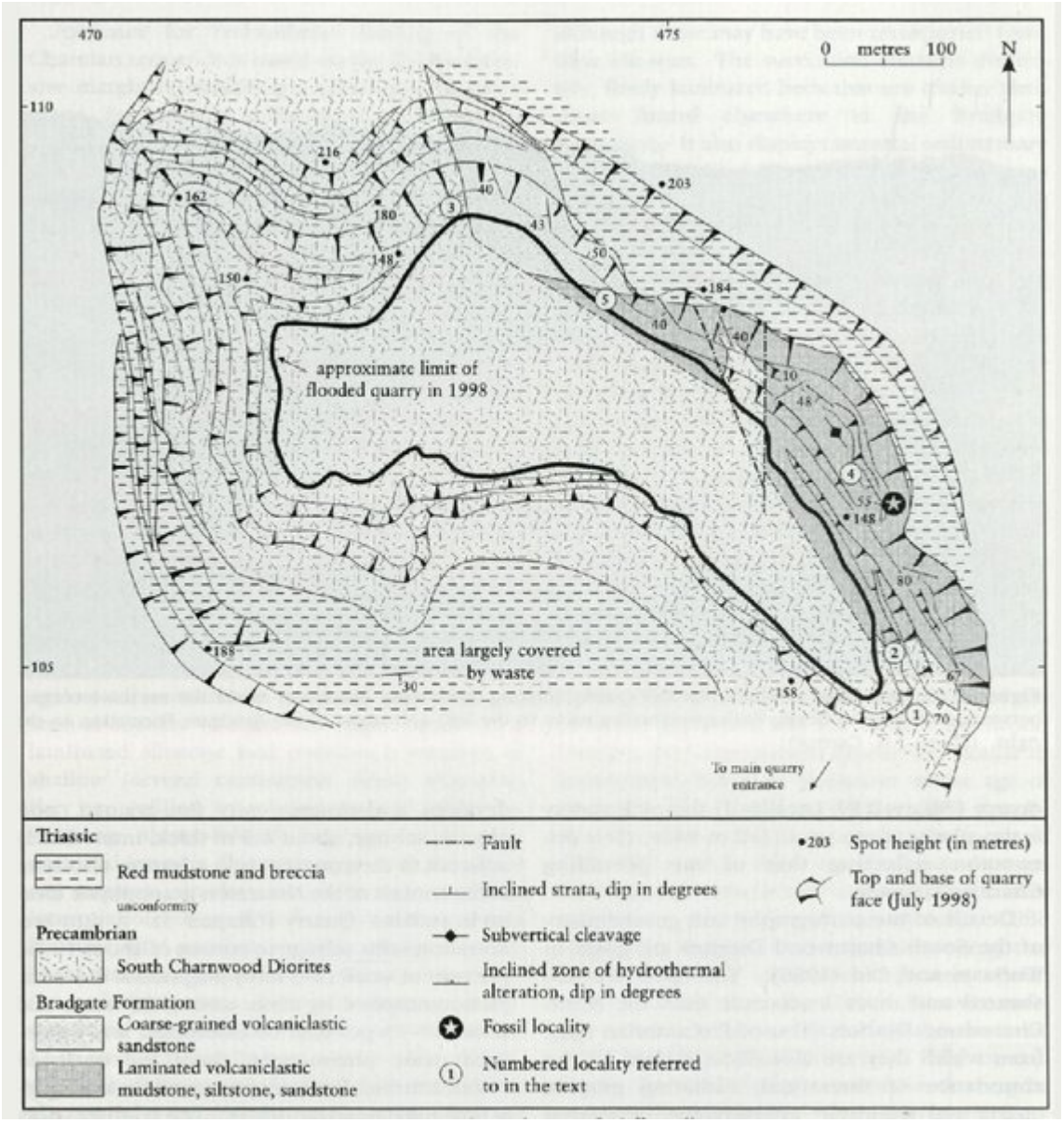
(Figure 2.16) Very thick, massive beds of coarse-grained volcaniclastic sandstone in the Bradgate Formation, exposed at the Hanging Stone. The bedding planes reflect the structural dip, which is to the north-east (from left to right). (Photo: J.N. Carney.)



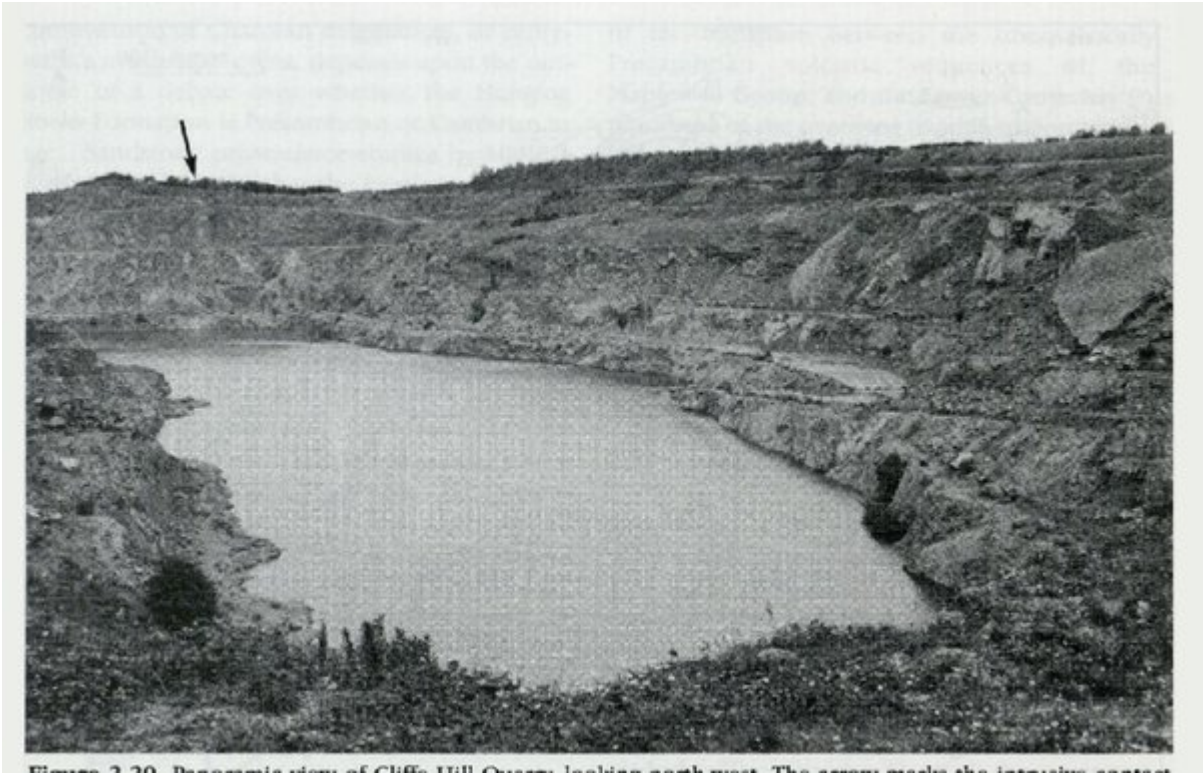
(Figure 2.17) Exposures at North Quarry in laminated, volcaniclastic siltstones near the top of the Bradgate Formation. The roped-up figure on the bedding plane is examining Precambrian fossil impressions (see Chapter 8). (Photo: T.D. Ford.)



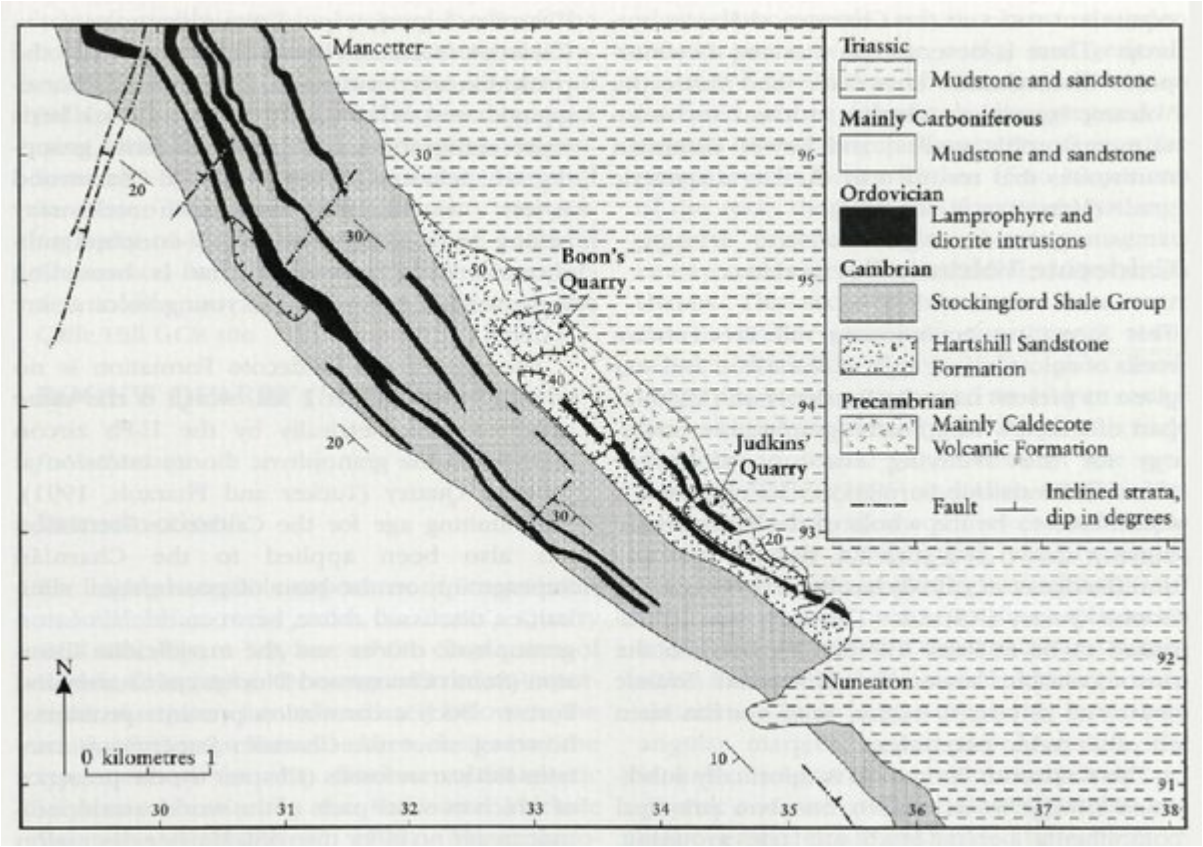
(Figure 2.18) Specimen of conglomerate from the Hanging Rocks Formation, Charnwood Forest Golf Course. Note the rounding of the pebbles and extremely low degree of sorting indicated by the range of clast sizes. (Photo: J.N. Carney.)



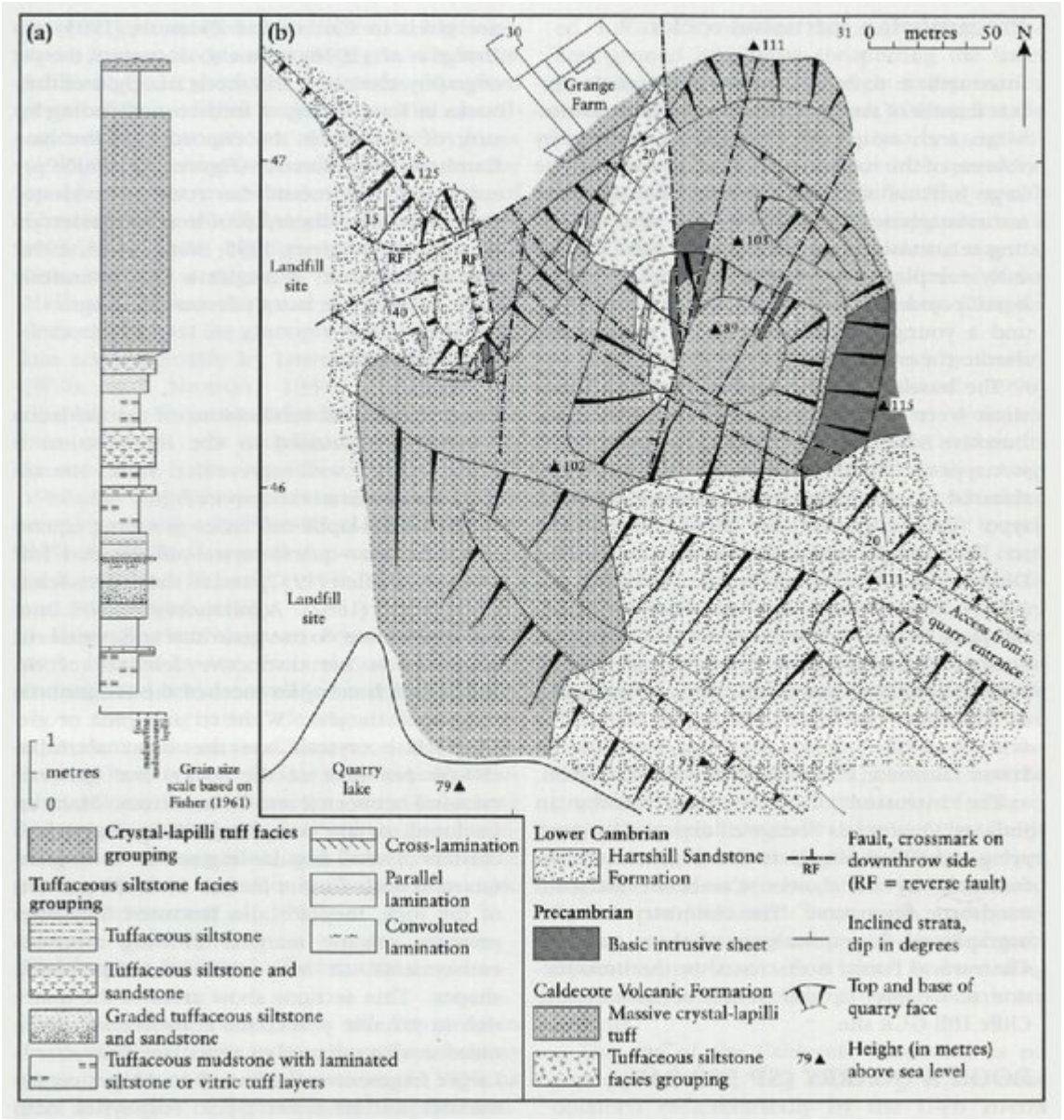
(Figure 2.19) Geological map of Cliffe Hill Quarry



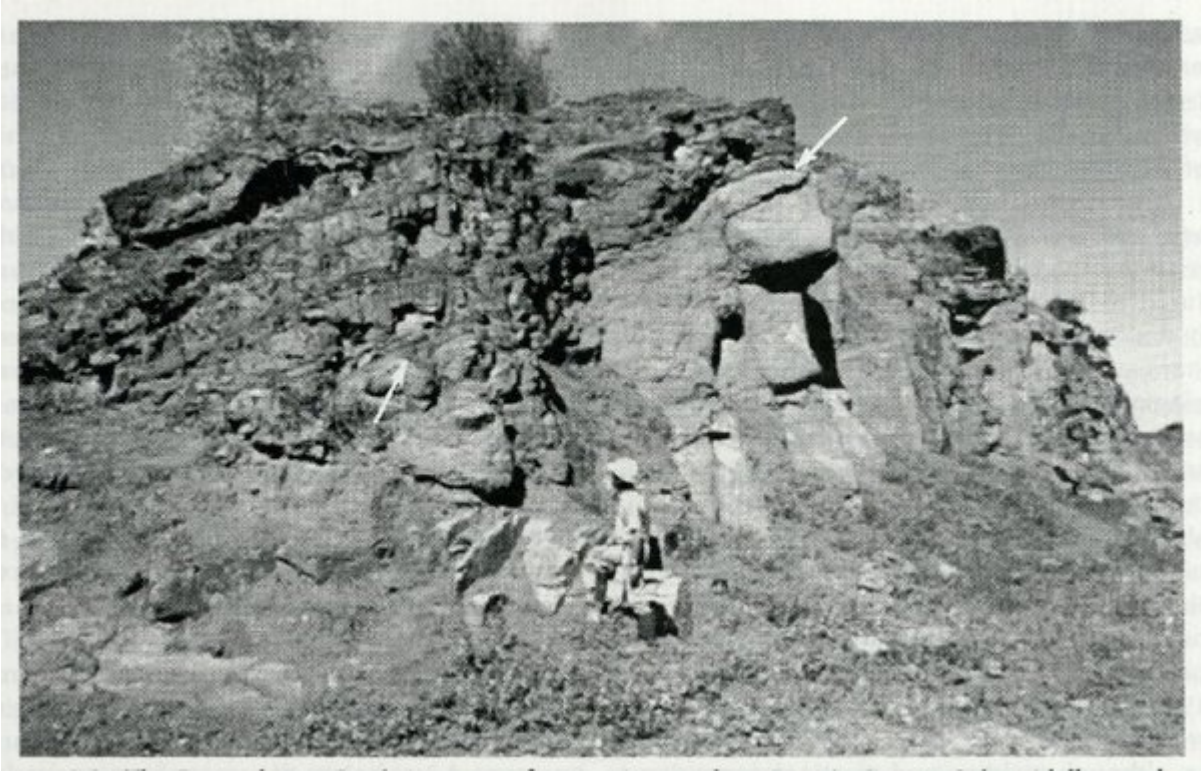
(Figure 2.20) Panoramic view of Cliffe Hill Quarry, looking north-west. The arrow marks the intrusive contact between granophyric diorite (paler-weathering rocks to the left) and strata of the Bradgate Formation to the right. (Photo: J.N. Carney.)



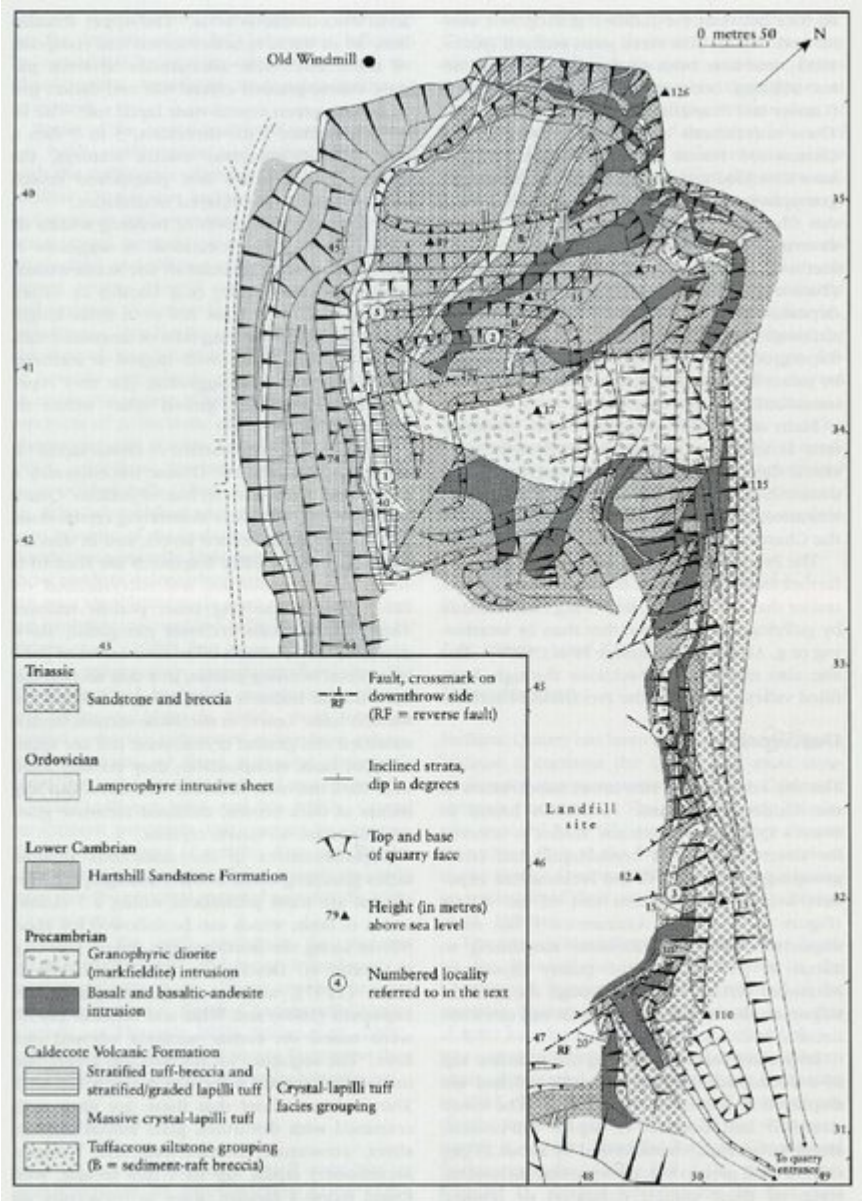
(Figure 3.1) Outline geological map of part of the Nuneaton Inlier, showing the location of the GCR sites (in bold lettering).



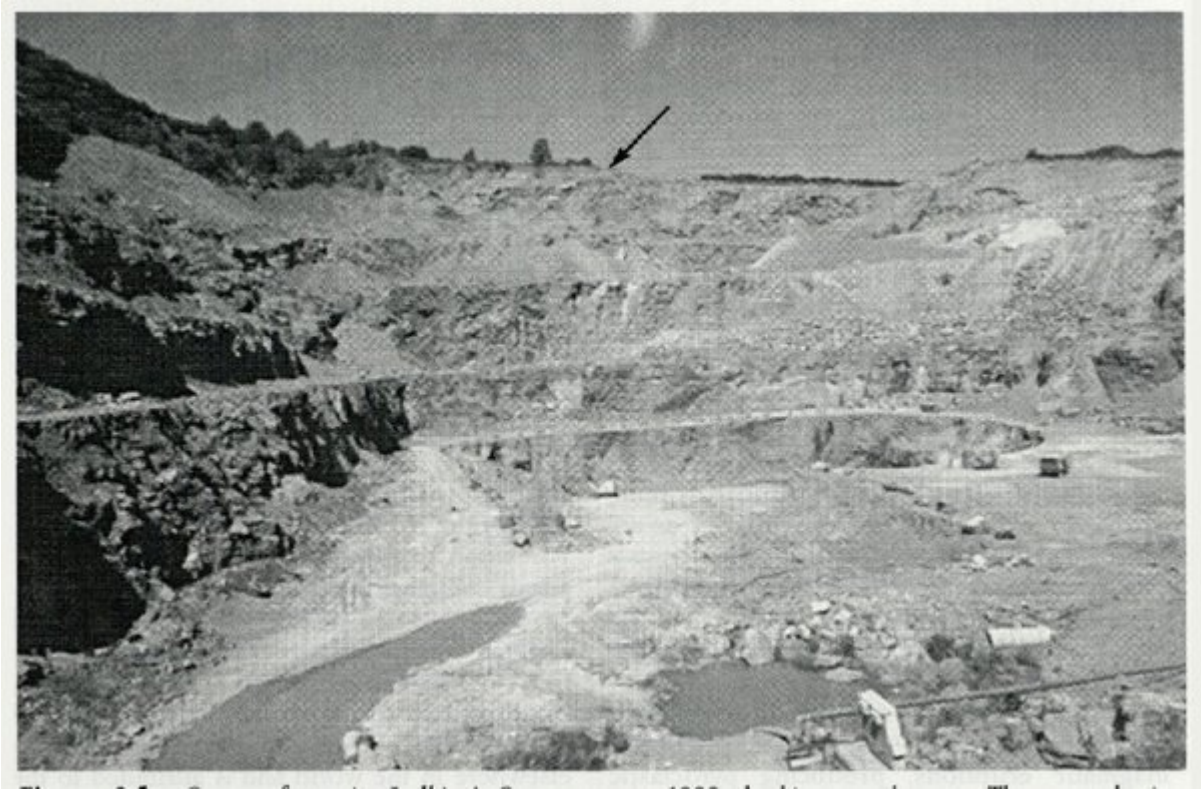
(Figure 3.2) Geological map of the northern part of Boon's Quarry (from Bridge et al., 1998). The column on the left is a composite section measured on the upper and lower quarry faces, immediately south of Grange Farm.



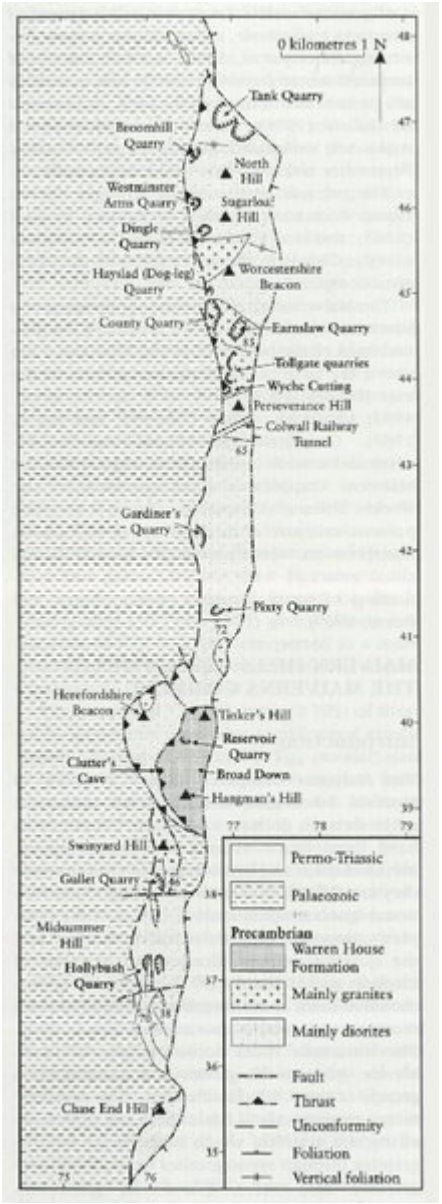
(Figure 3.3) The Precambrian—Cambrian unconformity (arrowed) at Boon's Quarry. Spheroidally weathered Precambrian crystal-lapilli tuff of the Caldecote Volcanic Formation is overlain by redbeds of the Boon's Member, basal to the Lower Cambrian Hartshill Sandstone Formation. (Photo: A14973, reproduced by kind permission of the Director, British Geological Survey, © NERC.)



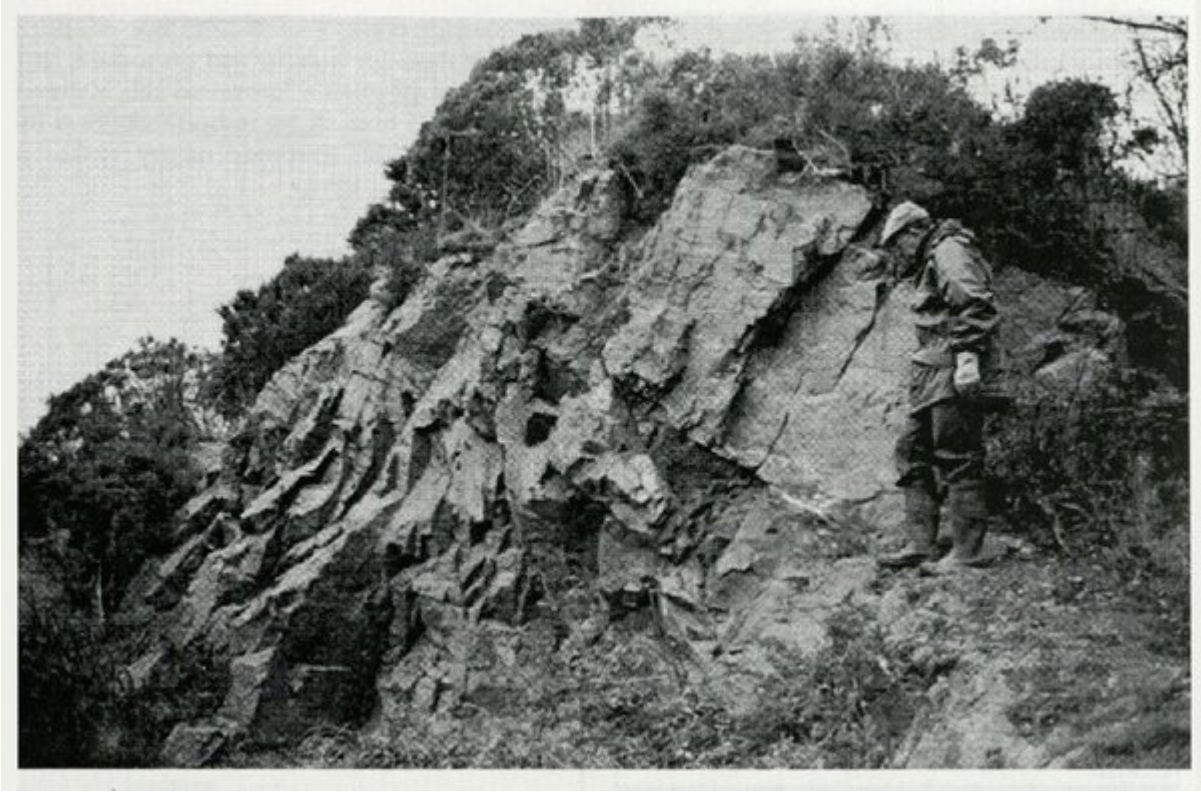
(Figure 3.4) Geological map of Judkins' Quarry (from Bridge et al., 1998). The upper north-west levels of the quarry, below the 'Old Windmill', are recommended for conservation in the GCR.



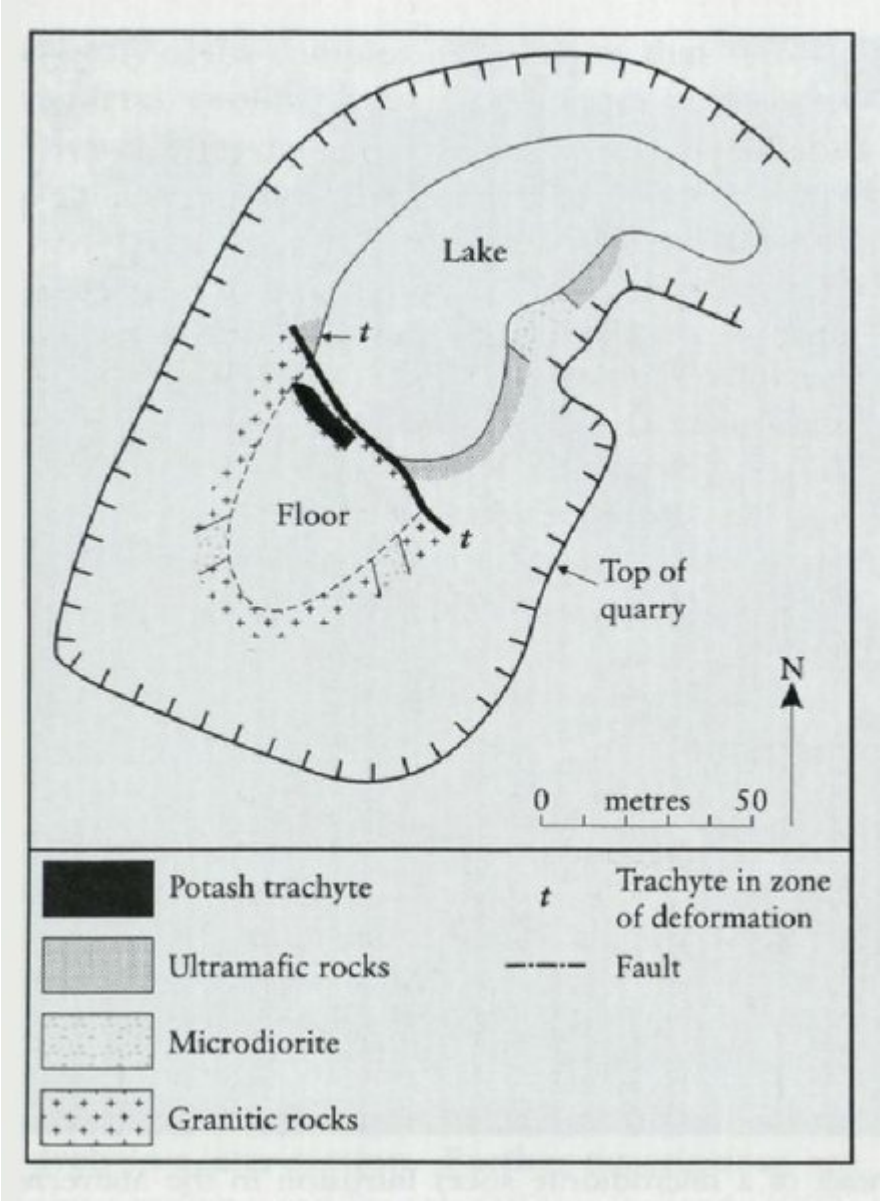
(Figure 3.5) Quarry faces in Judkins' Quarry as at 1990, looking north-west. The west-sloping Precambrian—Cambrian unconformity is arrowed, with the Caldecote Volcanic Formation exposed on the right of it. (Photo: A14979, reproduced by kind permission of the Director, British Geological Survey, © NERC.)



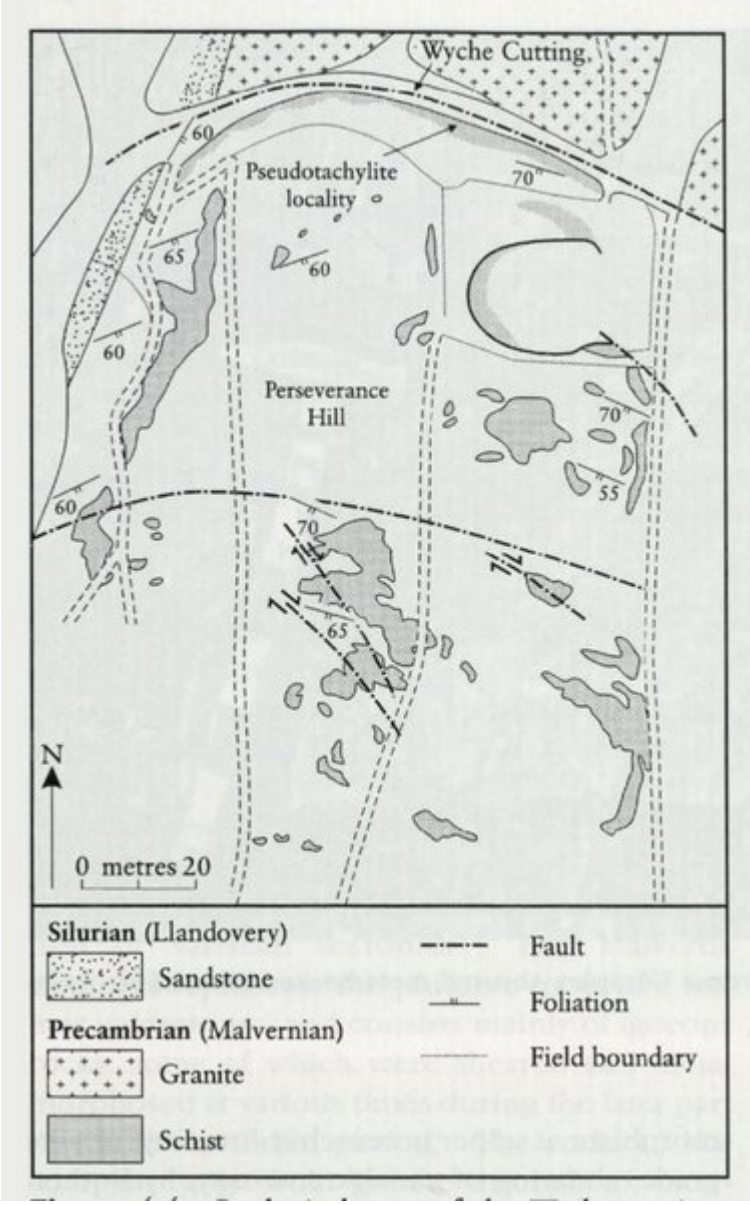
(Figure 4.1) Geological map of the Malvern Hills site, with main localities shown by bold lettering. Note that locally the granites and diorites are strongly foliated with schistose to gneissose fabrics developed. The map includes structural information from R. A. Strachan (pers. comm.) and Bullard (1975).



(Figure 4.2) Exposure at Dingle Quarry showing contact of a microdiorite sheet intrusion in the Malverns Complex. (Photo: T.C. Pharaoh.)

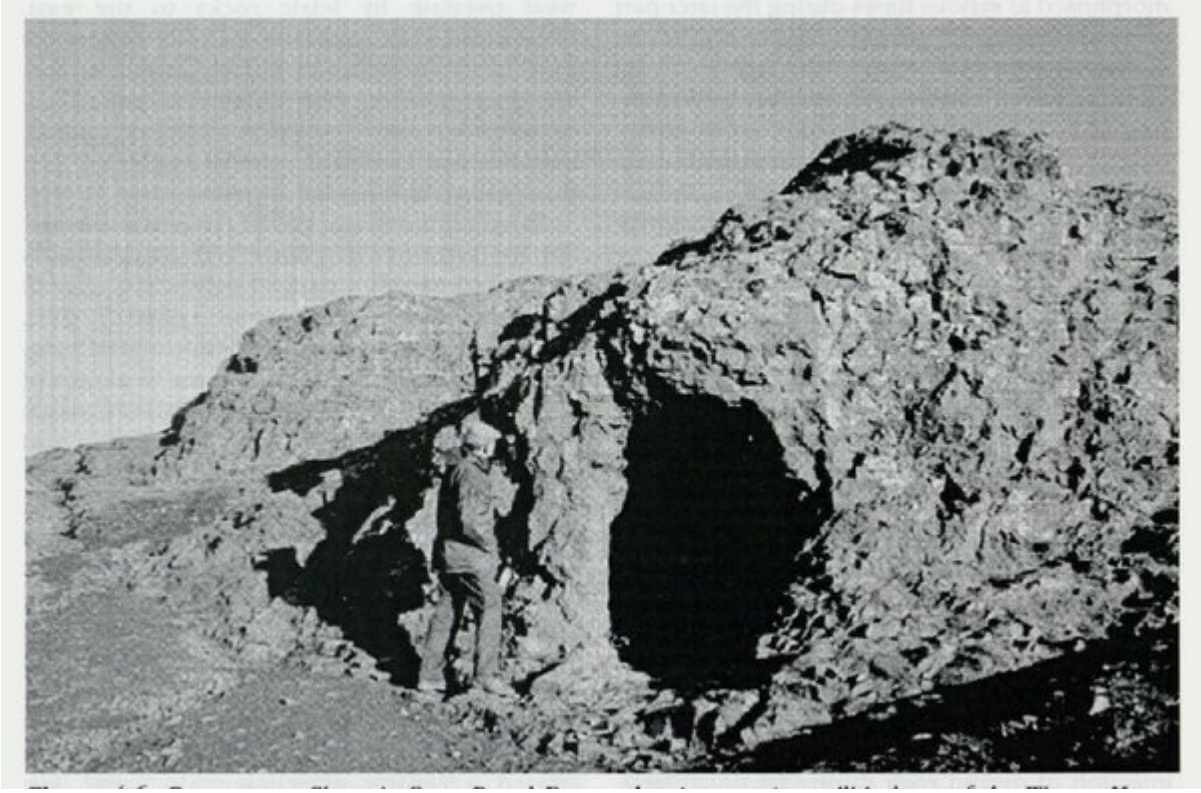


(Figure 4.3) Geological sketch map of Earnslaw Quarry (after Thorpe, 1971).

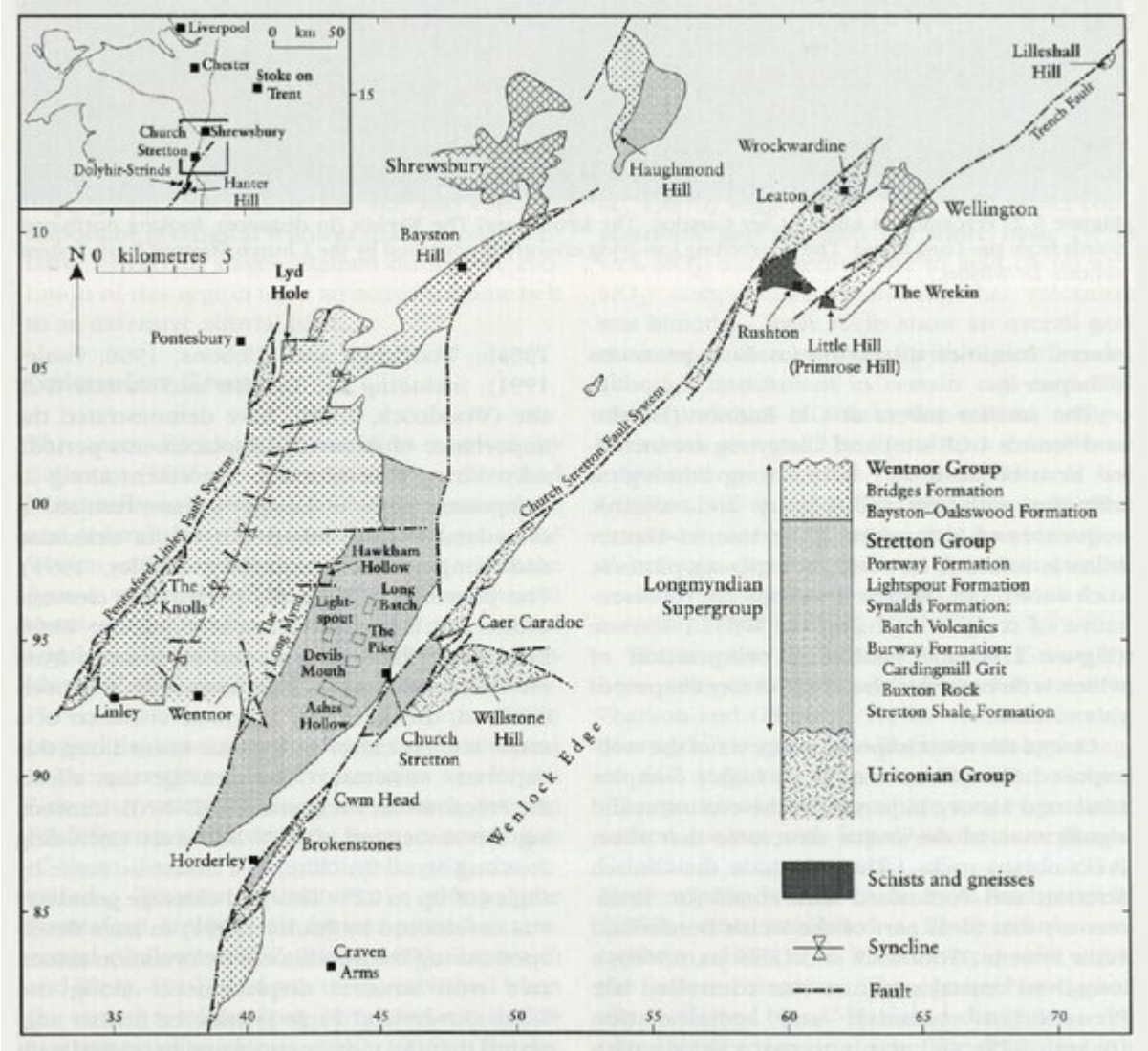


(Figure 4.4) Geological map of the Wyche cutting, after Thorpe (1987) and Brammall (1940).

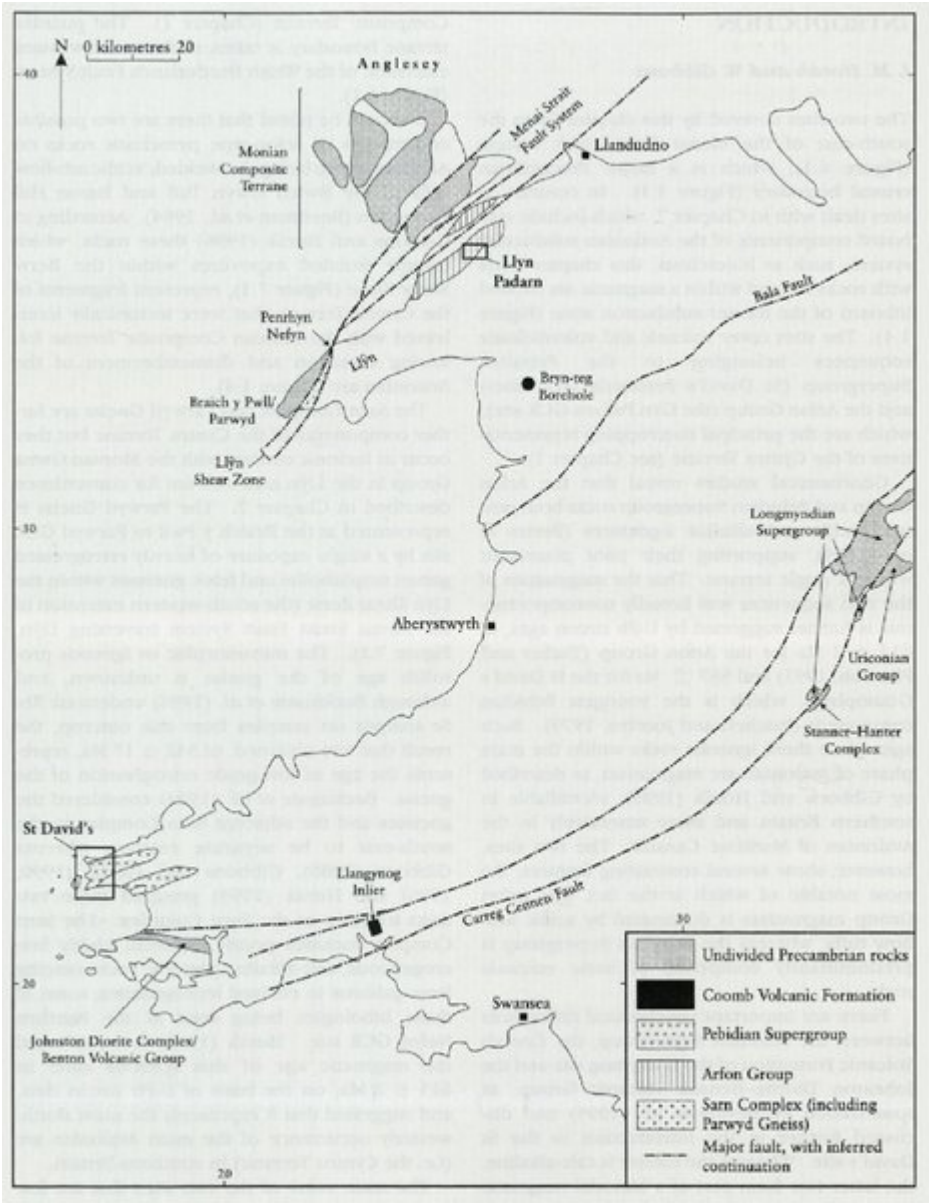
(Figure 4.5) Exposure in Gullet Quarry, showing Malverns Complex sheared metadiorites injected by (pale-toned) granitic veins. (Photo: T.C. Pharaoh.)



(Figure 4.6) Exposure at Clutter's Cave, Broad Down, showing massive spilitic lavas of the Warren House Formation with pillow structures (e.g. in front of observer). (Photo: T.C. Pharaoh.)

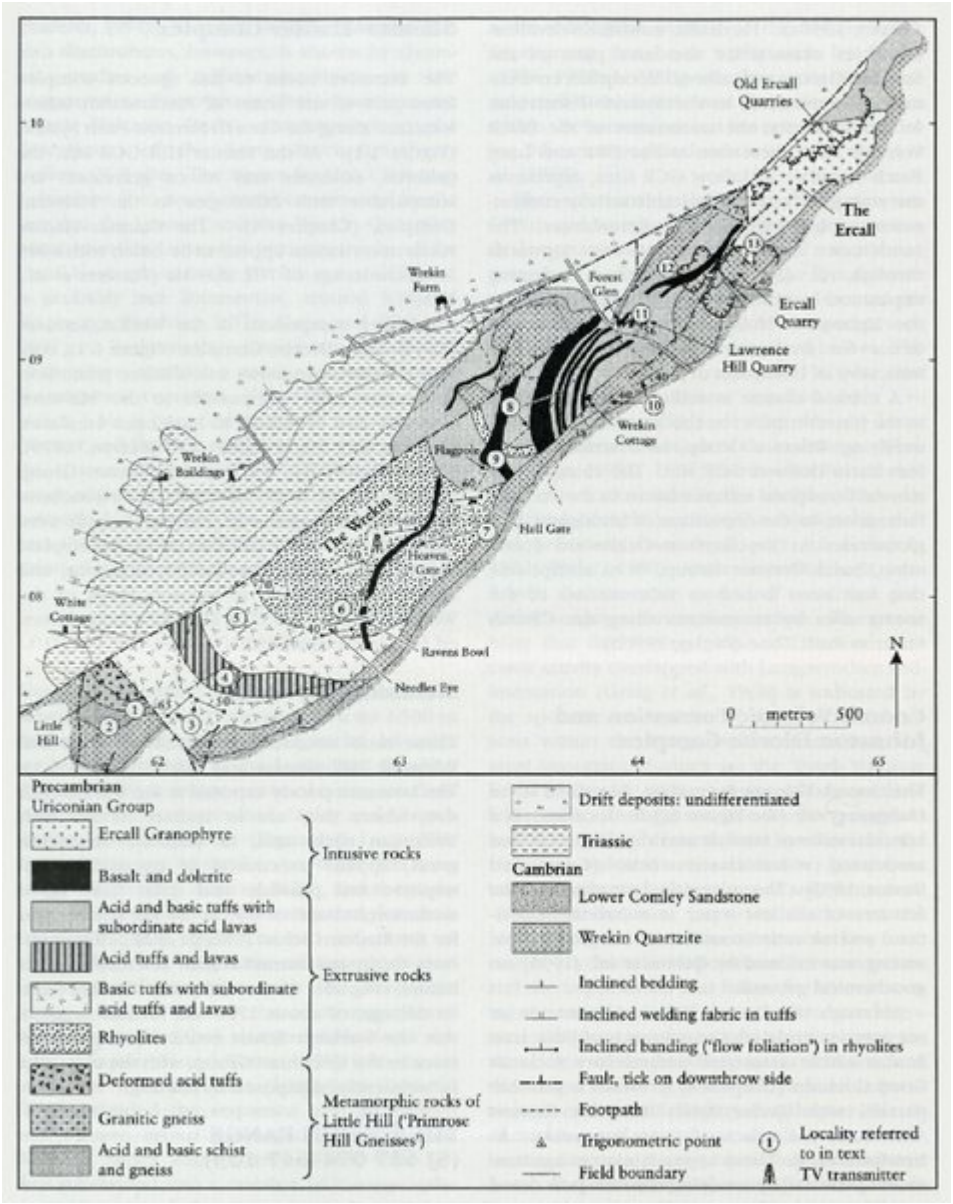


(Figure 5.1) Geological map of the Shropshire Precambrian outcrops (modified from Pauley, 1991), with the GCR sites indicated by bold lettering. The Radnor inliers (Dolyhir and Strinds quarries and Hanter Hill sites) are shown by the inset at top left. The location of the Llangynog site is given in (Figure 6.1).

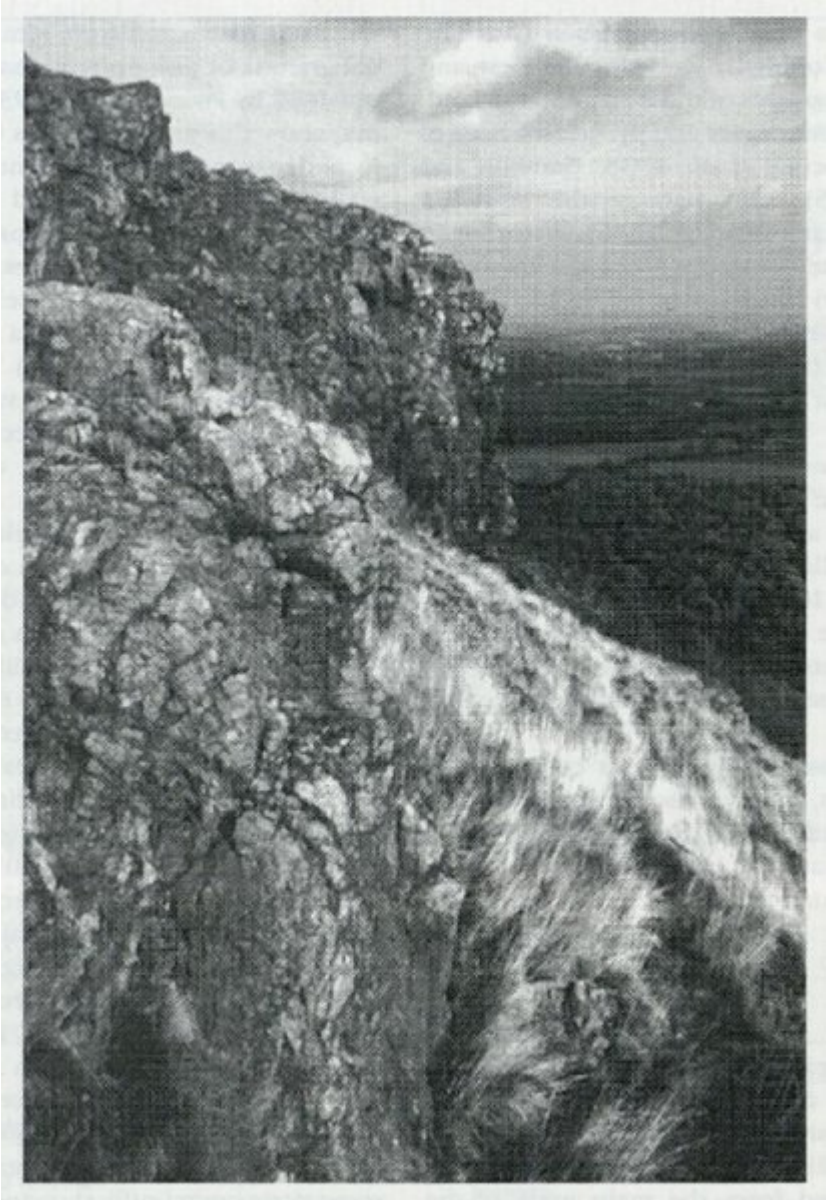


(Figure 6.1) Geological map showing the relationship of the St David's and Llyn Padarn sites to other Precambrian outcrops.

(Figure 5.2) Precambrian hills of Caer Caradoc, The Lawley and The Wrekin (in distance), looking north-eastwards from the Long Mynd. The intervening low-lying country is occupied by the Church Stretton Fault System. (Photo: D. Wilson.)



(Figure 5.3) Geological map of the Wrekin range.



(Figure 5.4) Crags in massive, silicified rhyolitic lavas of the Uriconian Group at Raven's Bowl, south-east side of The Wrekin. (Photo: D. Wilson.)

(Figure 5.5) Exposures in Ercall Quarry showing the Ercall Granophyre (left of picture) unconformably overlain by well-bedded Lower Cambrian Wrekin Quartzite. (Photo: D. Wilson.)

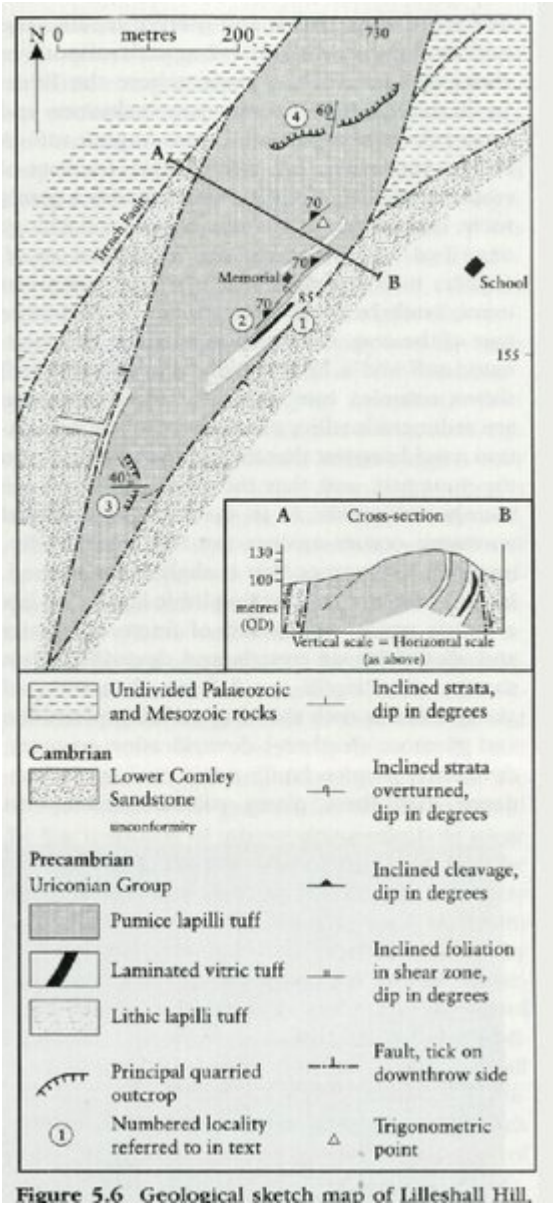
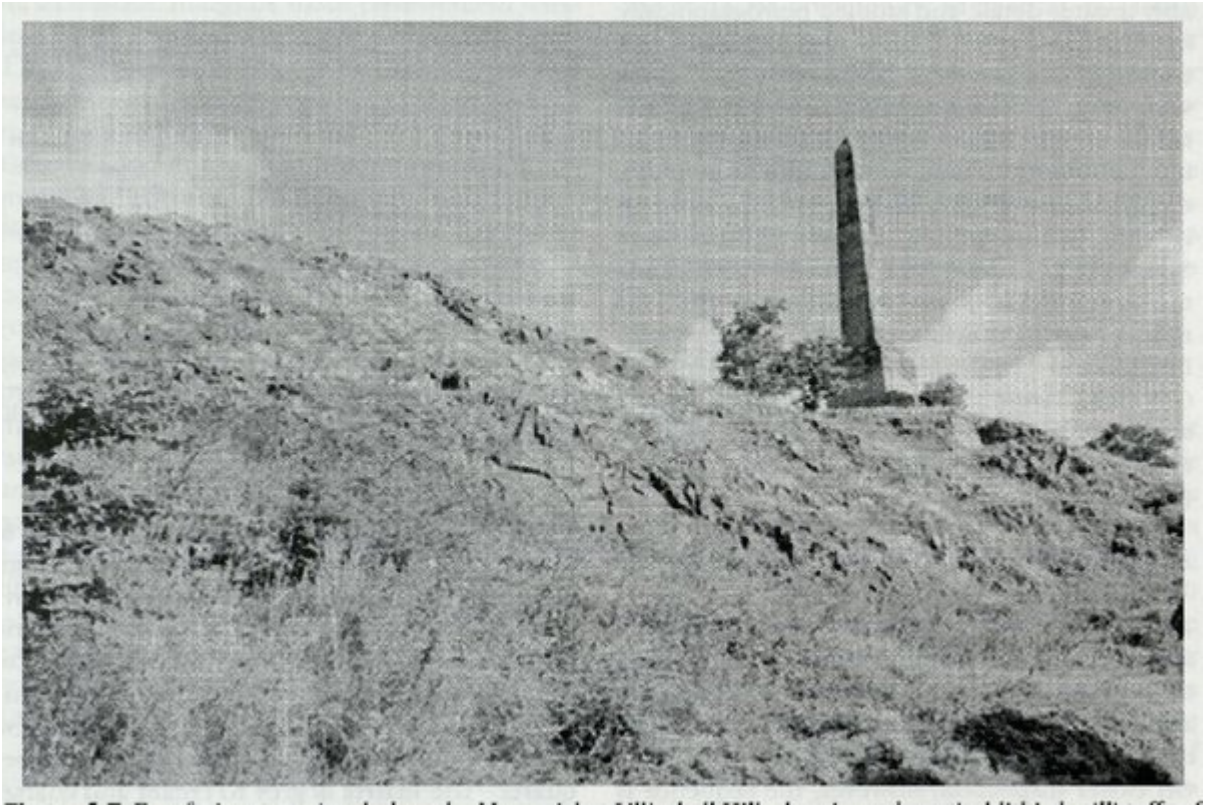
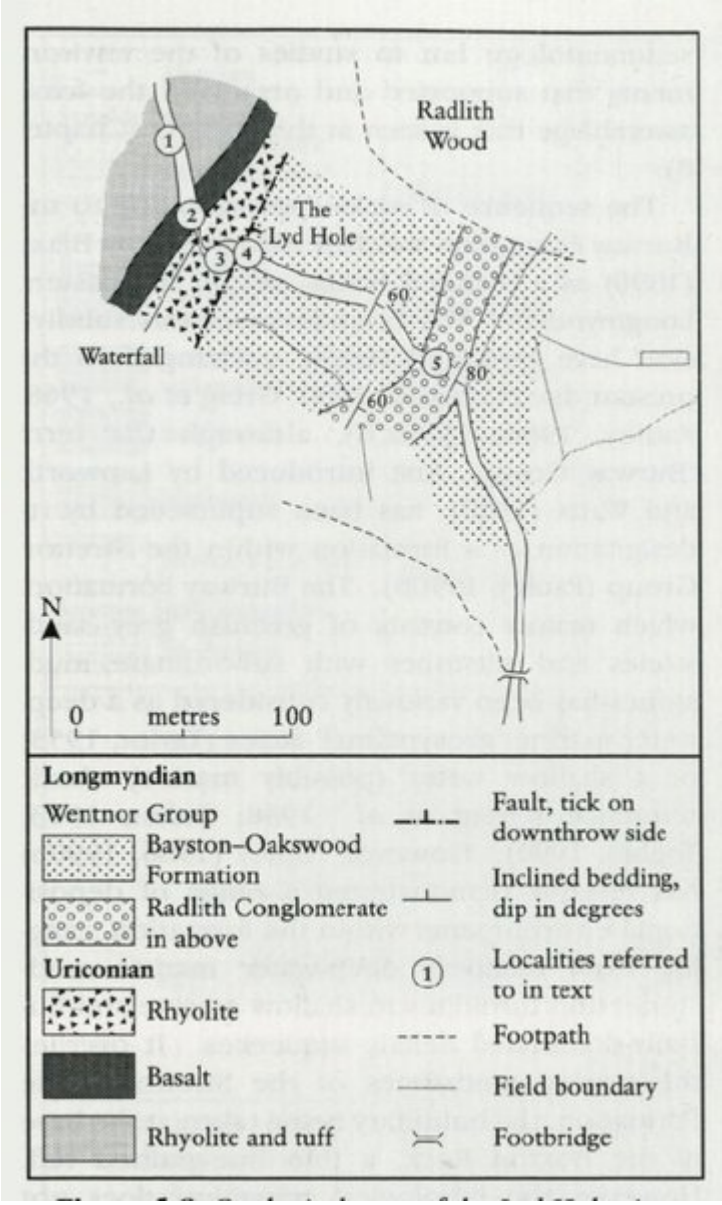


Figure 5.6 Geological sketch map of Lilleshall Hill.

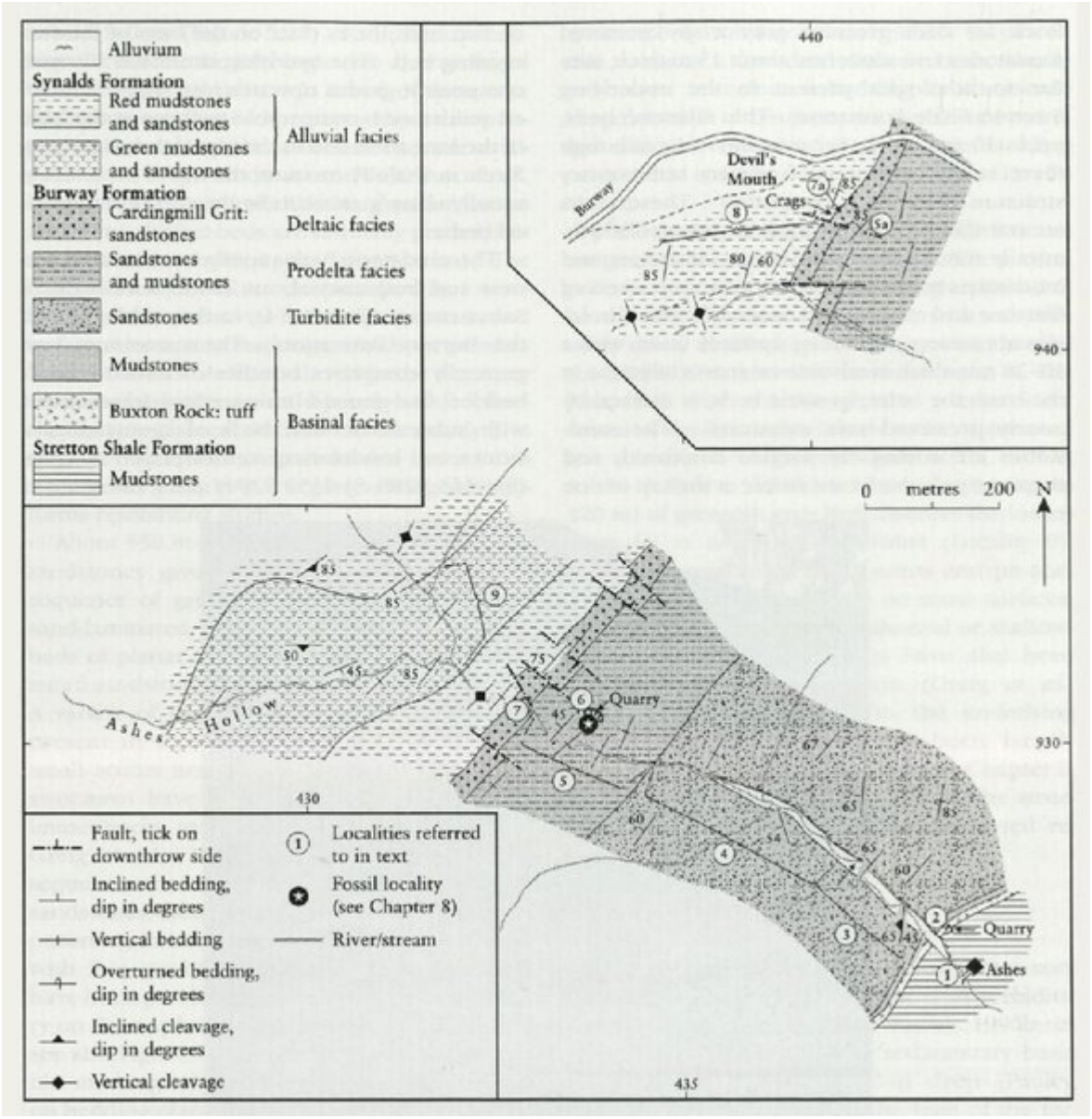
(Figure 5.6) Geological sketch map of Lilleshall Hill, with cross section at lower right.



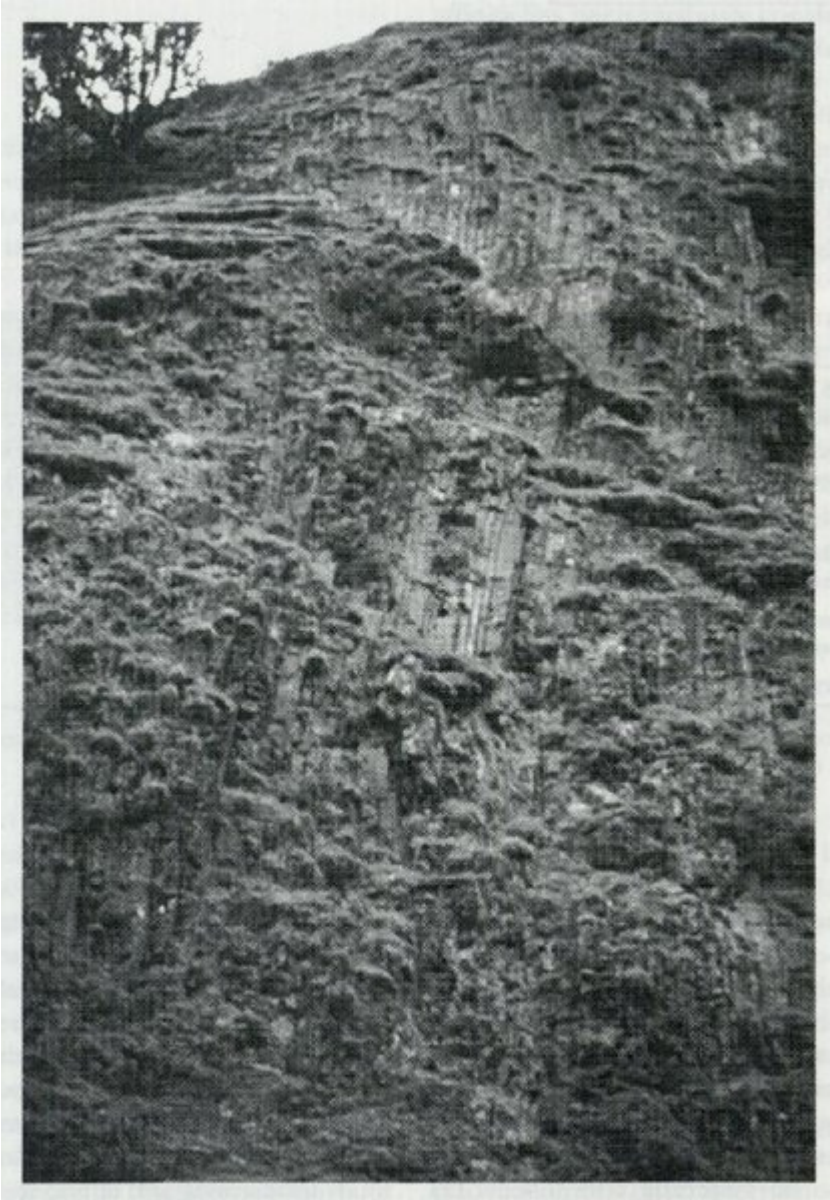
(Figure 5.7) East-facing crags just below the Memorial at Lillieshall Hill, showing sub-vertical lithic lapilli tuffs of the Uriconian Group. (Photo: J.N. Carney.)



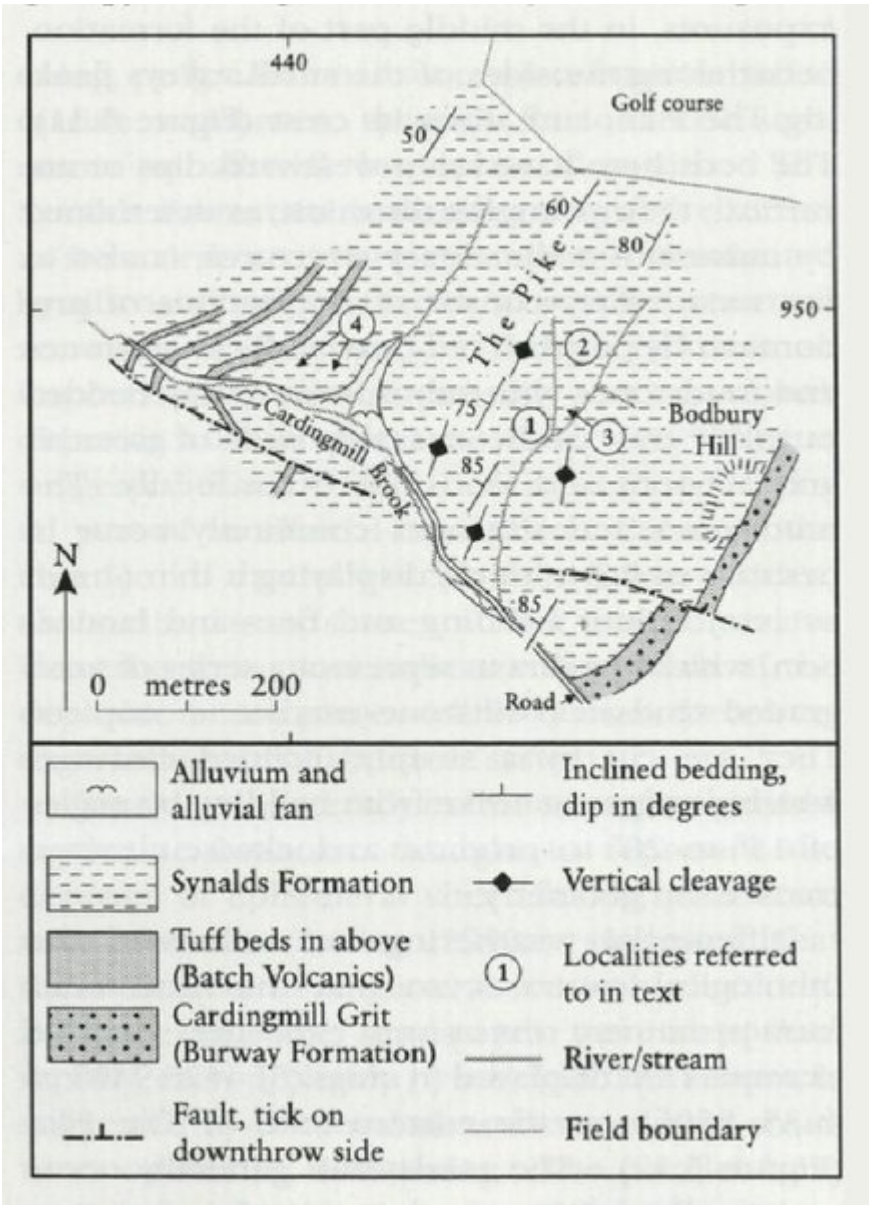
(Figure 5.8) Geological map of the Lyd Hole site.



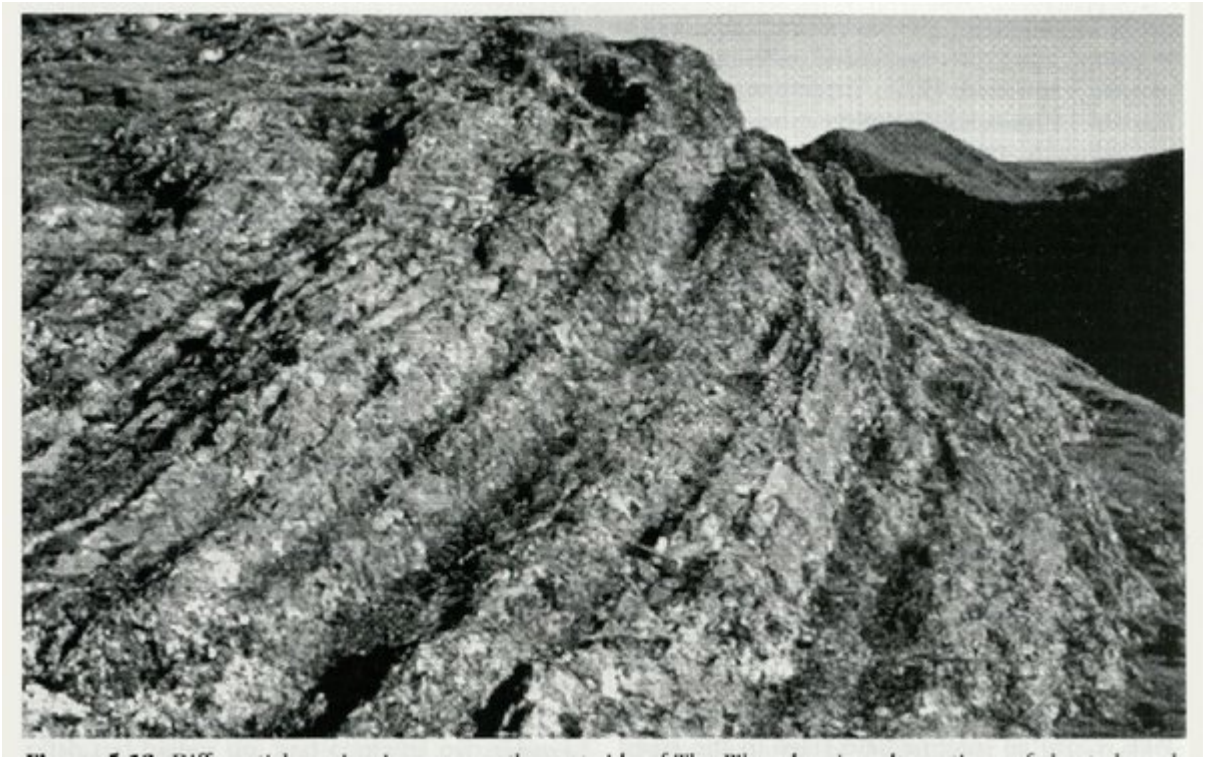
(Figure 5.9) Geological map of the Ashes Hollow and Devil's Mouth sites. The range of sedimentary environments in this part of the Stretton Group is indicated on the explanation at top left.



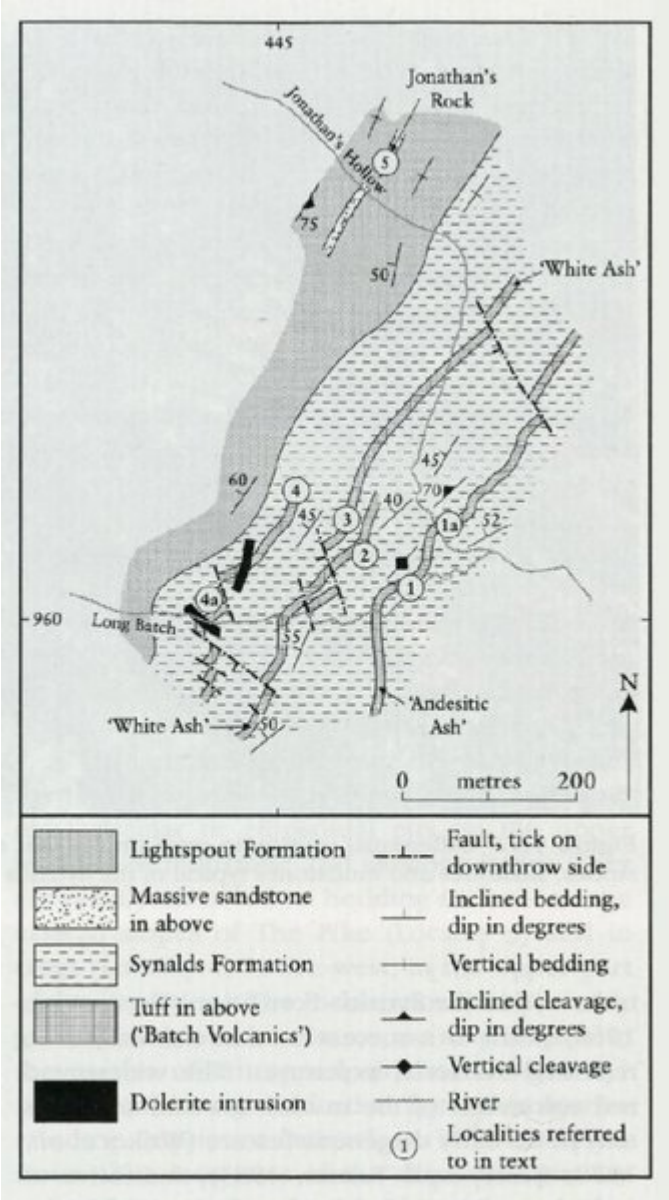
(Figure 5.10) Crags along Ashes Hollow showing vertical beds of rhythmically bedded, thick to thin-bedded tur-biditic sandstones and siltstones of the Burway Formation. (Photo: D. Wilson.)



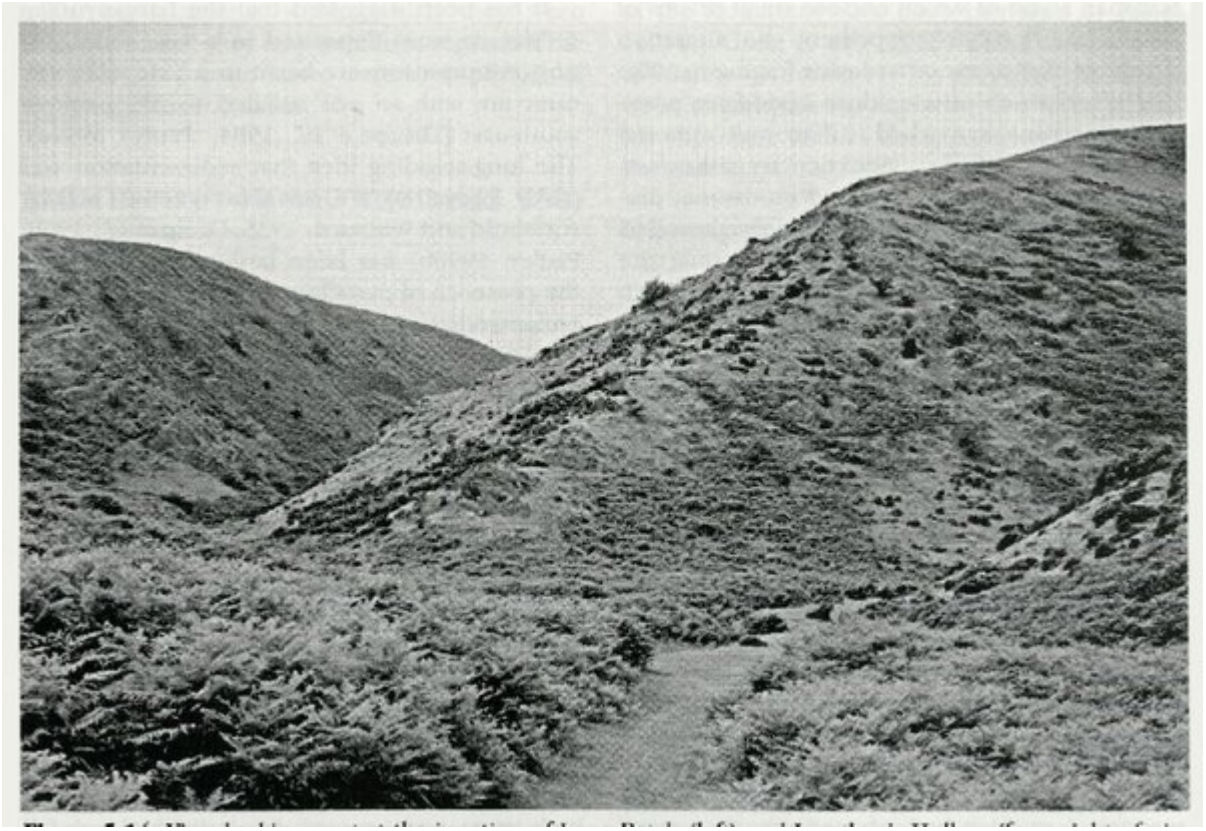
(Figure 5.11) Geological map of The Pike site.



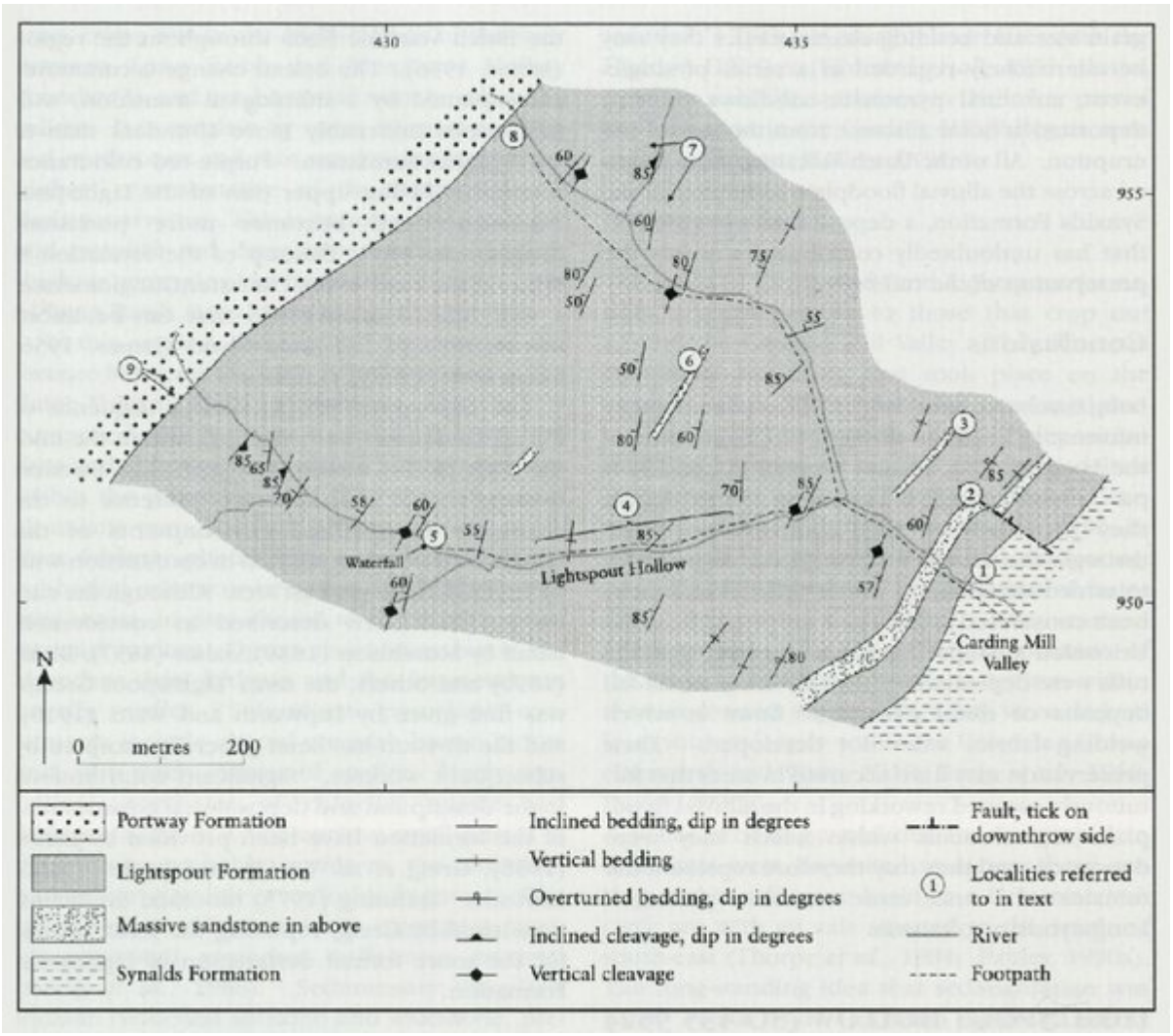
(Figure 5.12) Differential erosion in crags on the east side of The Pike, showing alternations of sheeted sandstones, siltstones and mudstones typical of the Synalds Formation. (Photo: D. Wilson.)



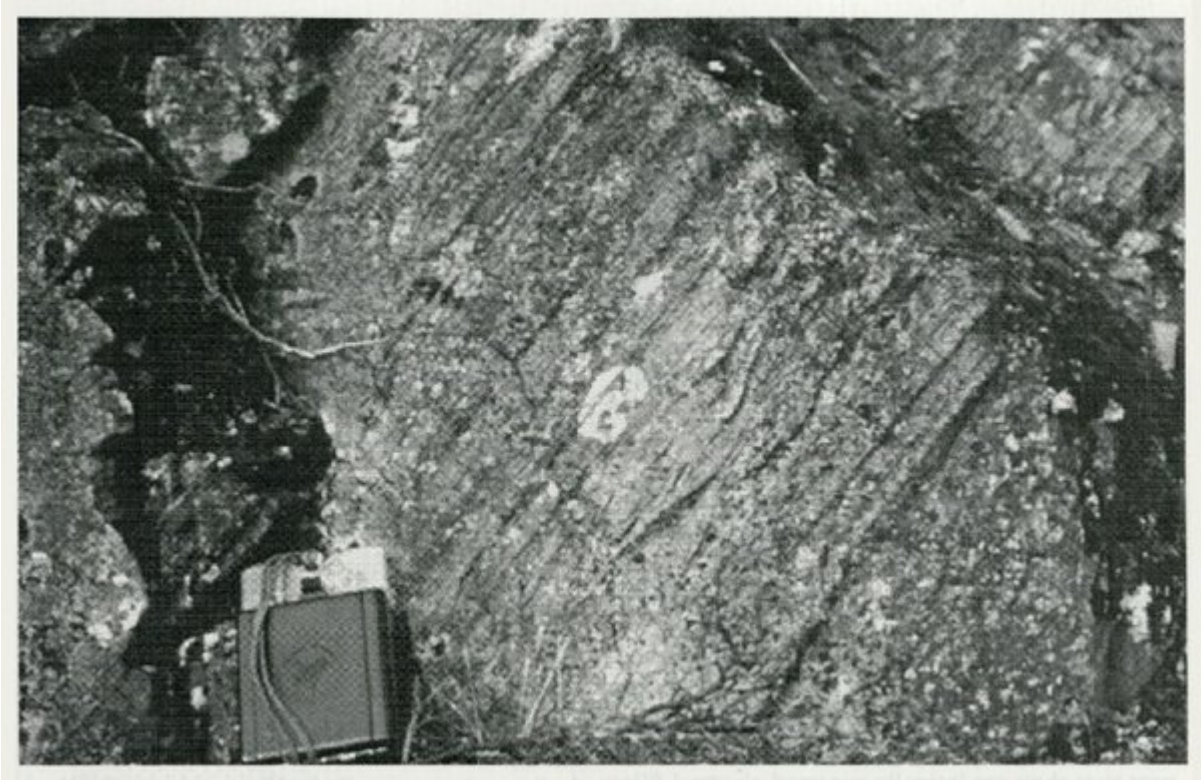
(Figure 5.13) Geological map of the Long Batch Jonathan's Hollow site.



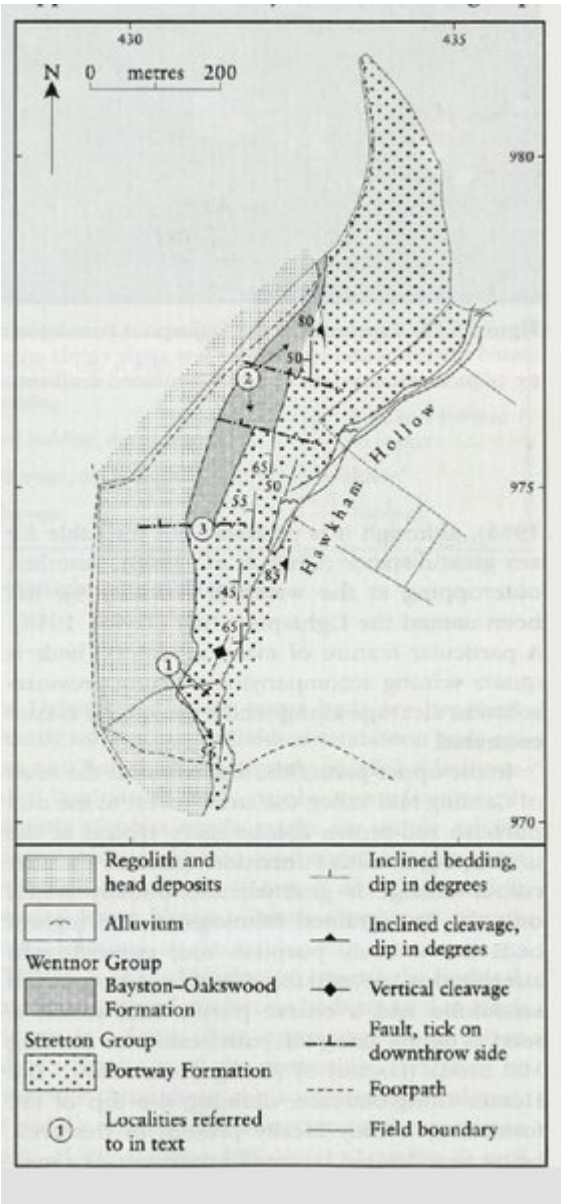
(Figure 5.14) View looking west at the junction of Long Batch (left) and Jonathan's Hollow (from right of picture). Crags at base of spur are formed by the Andesitic Ash crossing from right to left across the spur. (Photo: A9425, reproduced by kind permission of the Director, British Geological Survey, © NERC.)



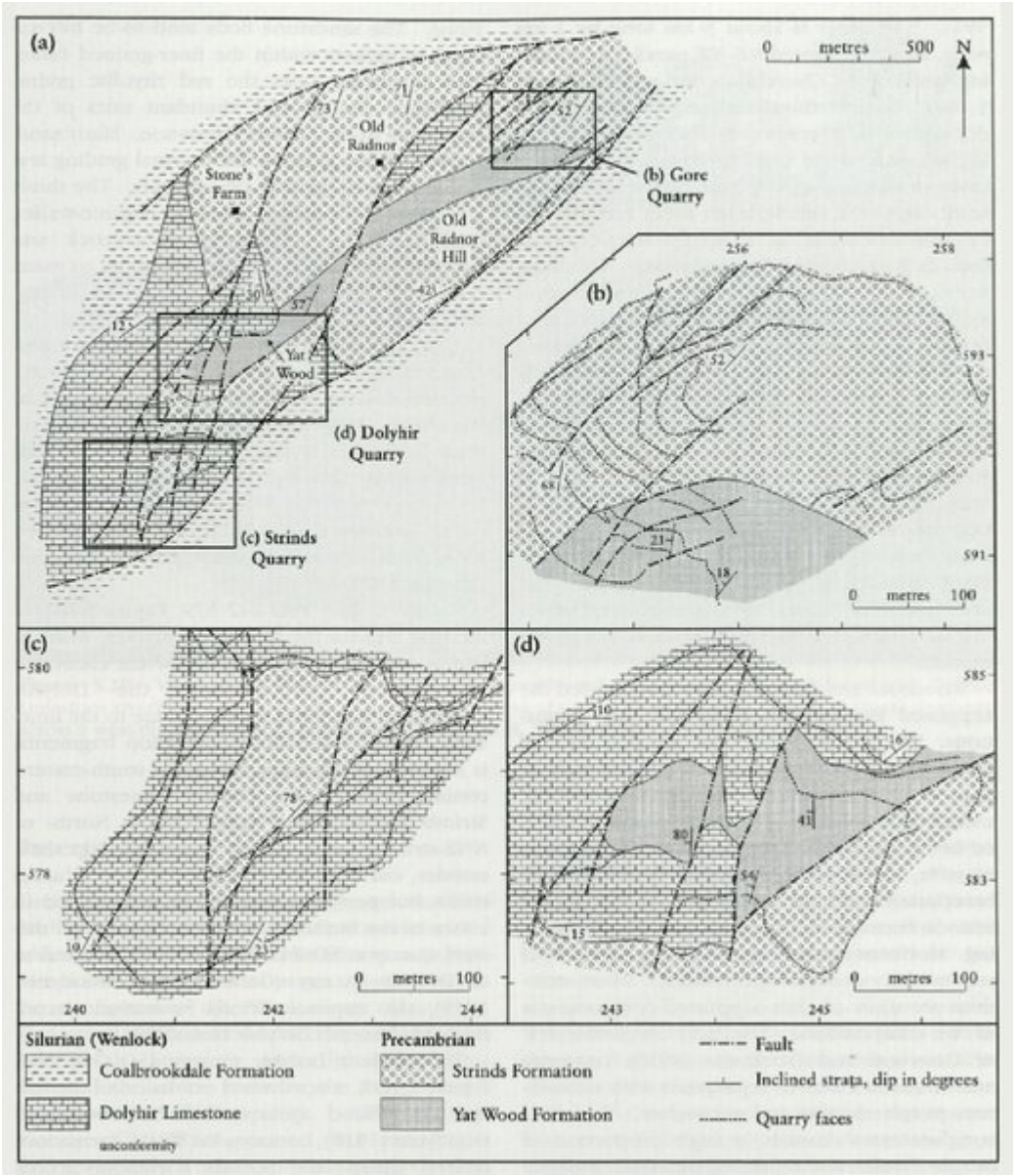
(Figure 5.15) Geological map of the Lightspout Hollow site.



(Figure 5.16) Exposures in the Lightspout Formation by the path along Lightspout Hollow, showing thinly laminated siltstones and mudstones low-angle ripple cross-lamination and small scours or convolute laminae (centre of picture). Overlain by cross-laminated sandstone. (Photo: D. Wilson.)

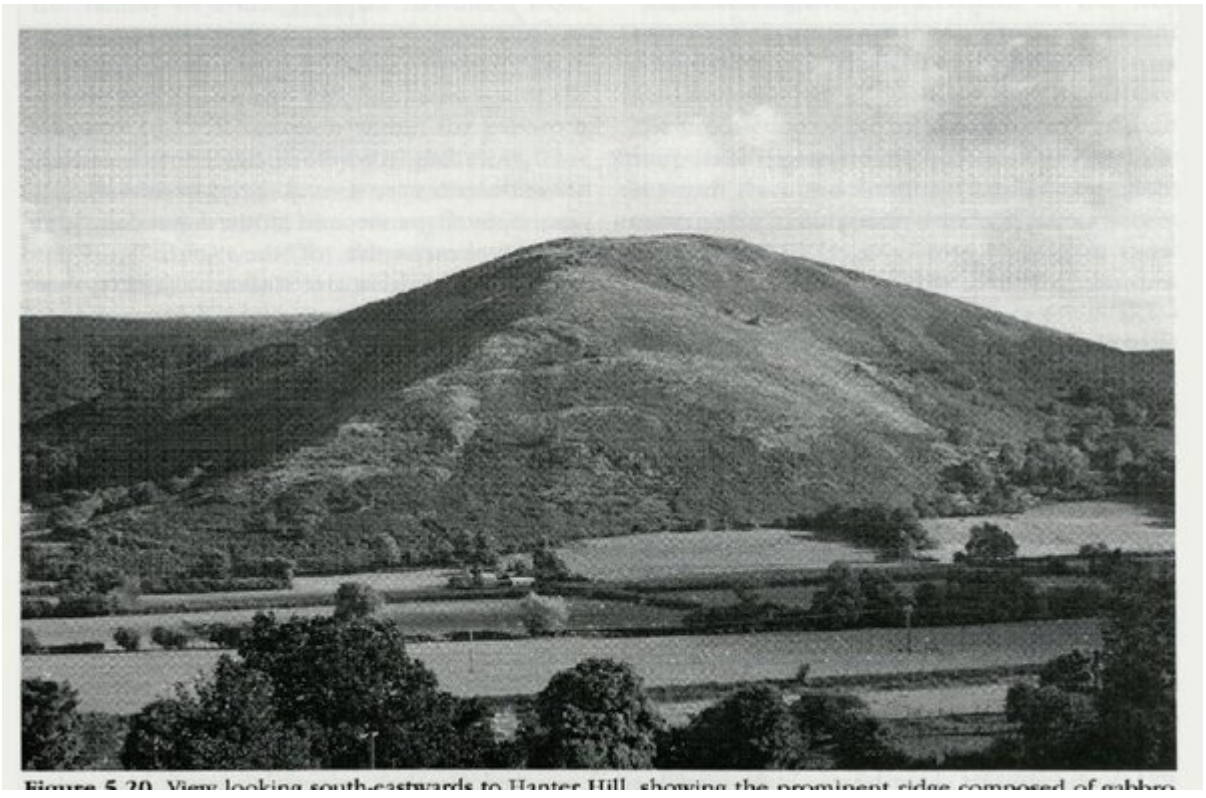


(Figure 5.17) Geological map of Hawkham Hollow site. can be studied, as well as providing a section through the generally poorly exposed Portway Formation, at the top of the Stretton Group.

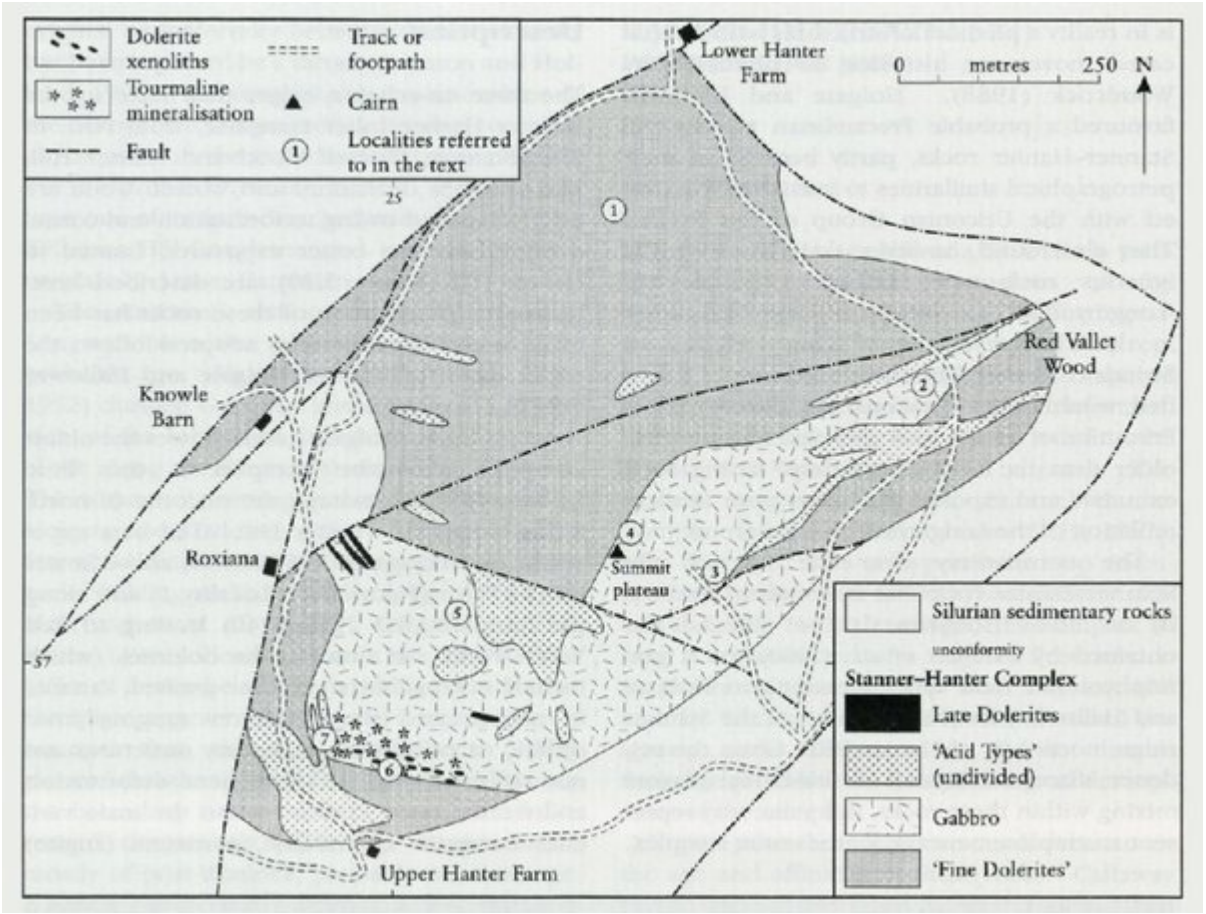


(Figure 5.18) Geological maps of (a) the Old Radnor Inlier and (b, c, d) the three most extensive quarries within it.

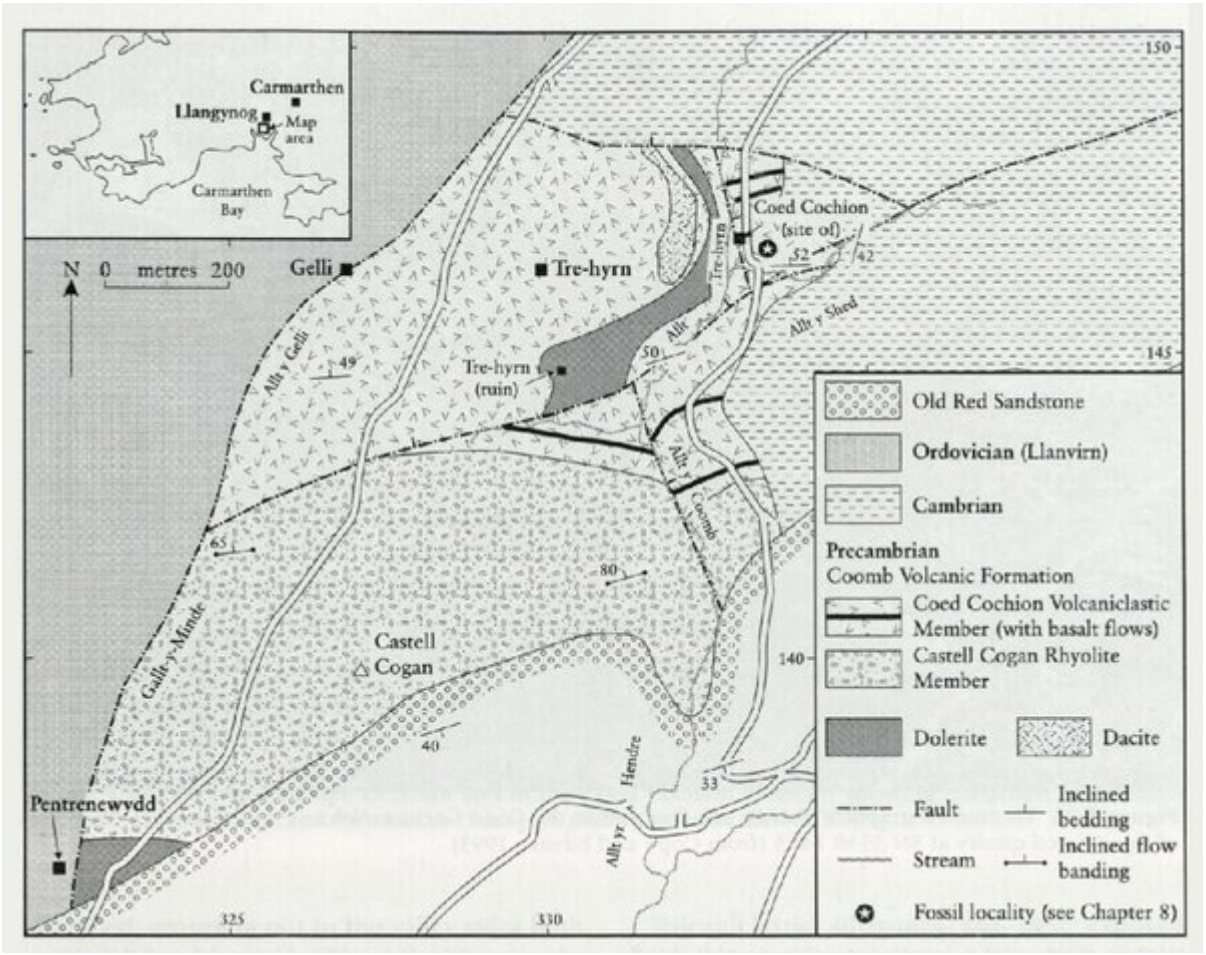
(Figure 5.19) View across Dolyhir Quarry, looking northward from [SO 244 583]. Sub-horizontal Dolyhir Limestone overlies westward-dipping Longmyndian strata of the Yat Wood Formation. Both units are displaced across a west-dipping dip-slip normal fault. (Photo: N.H. Woodcock.)



(Figure 5.20) View looking south-eastwards to Hanter Hill, showing the prominent ridge composed of gabbro and lower north facing crags of 'Fine Dolerites'. (Photo: K.A. Jones.)

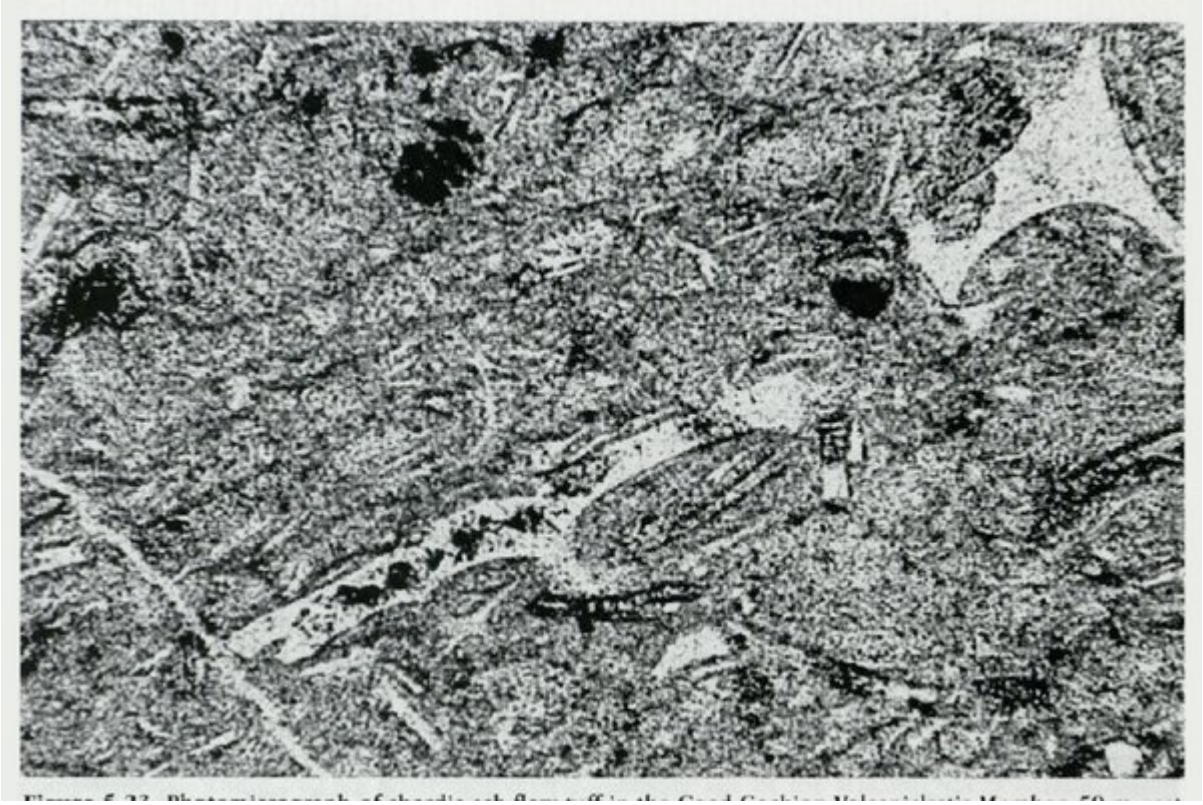


(Figure 5.21) Geological sketch map of Hanter Hill (modified after Holgate and Hallowes, 1941).

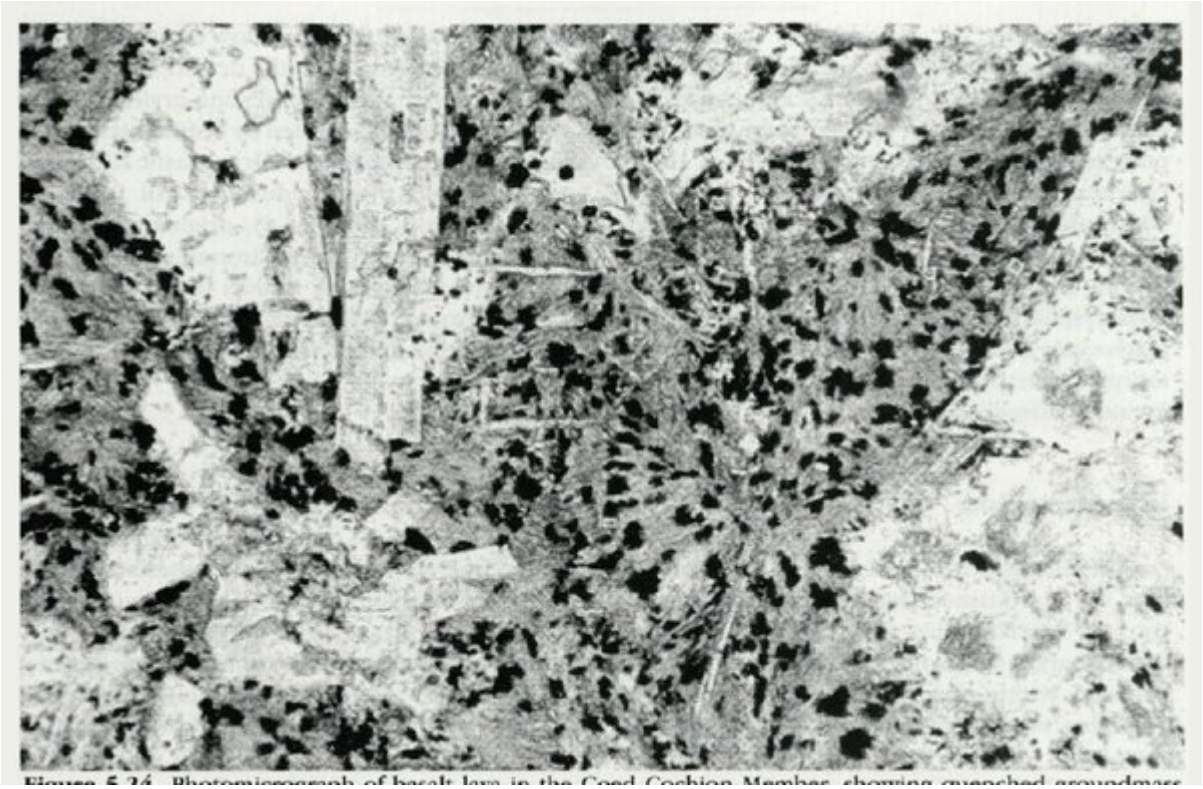


(Figure 5.22) Geological map of the Llangynog inlier, including the Coed Cochion palaeontological site. This diagram is reproduced with the permission of the Geological Magazine, Cambridge University Press (modified from Cope and

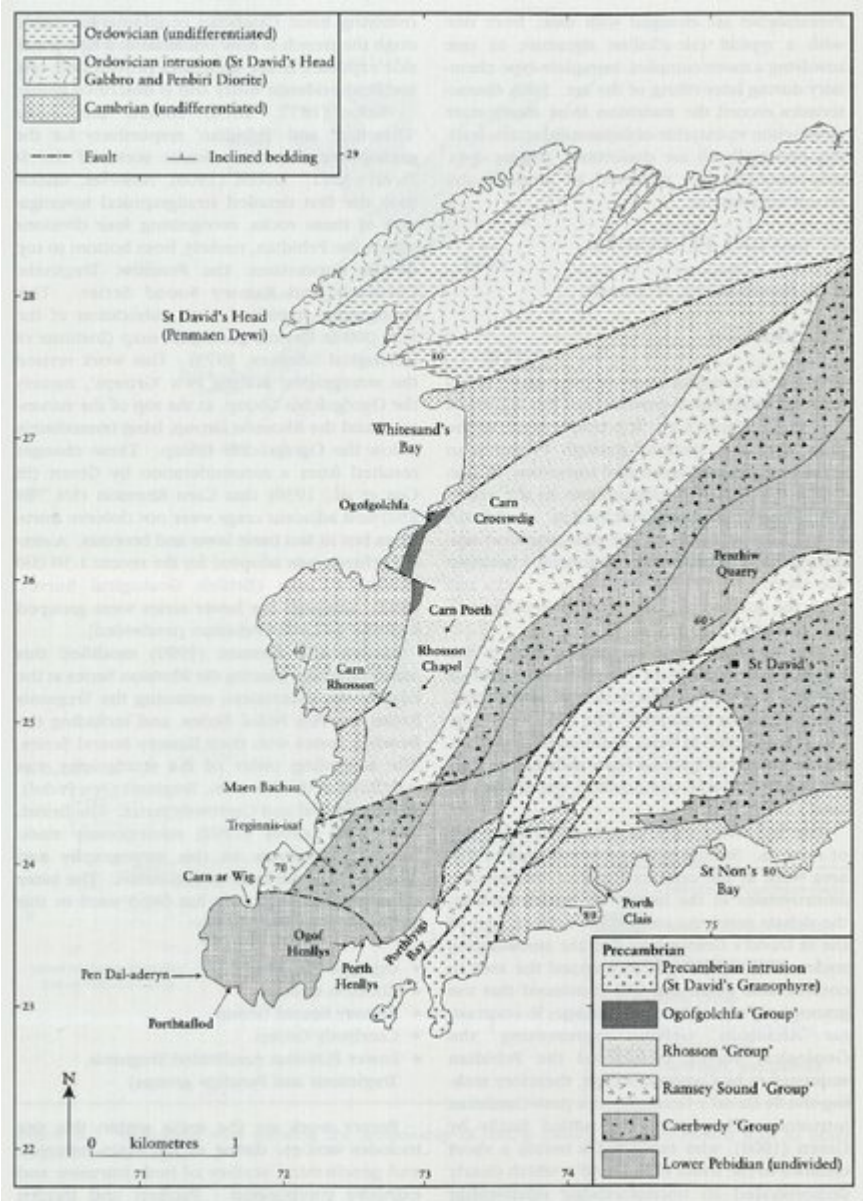
Bevins, 1983).



(Figure 5.23) Photomicrograph of shardic ash-flow tuff in the Coed Cochion Volcaniclastic Member, 50 m cast of the disused quarry at [SN 3338 1463] (from Cope and Bevins, 1993).



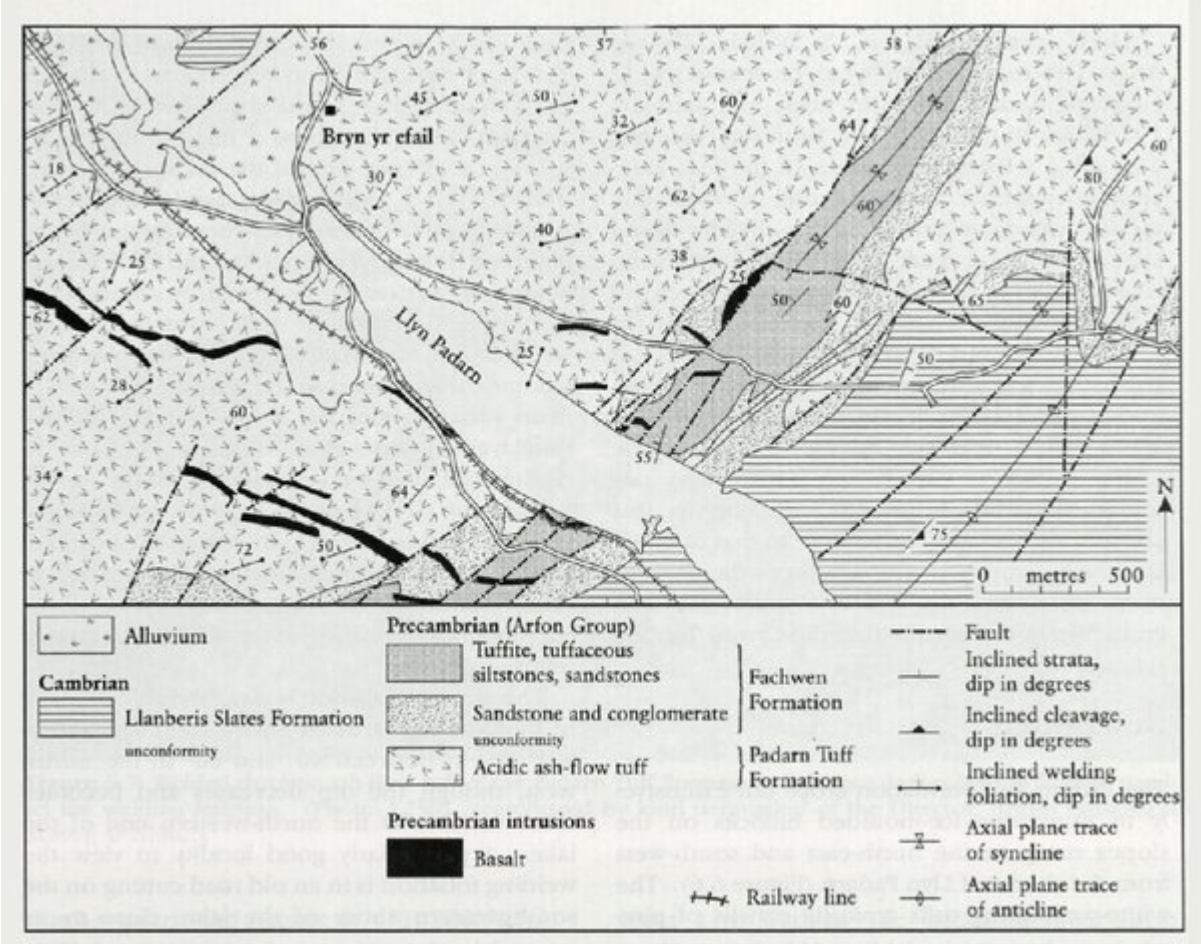
(Figure 5.24) Photomicrograph of basalt lava in the Coed Cochion Member, showing quenched groundmass with skeletal, spherulitic and belt-buckle' feldspars (from Cope and Bevins, 1993).



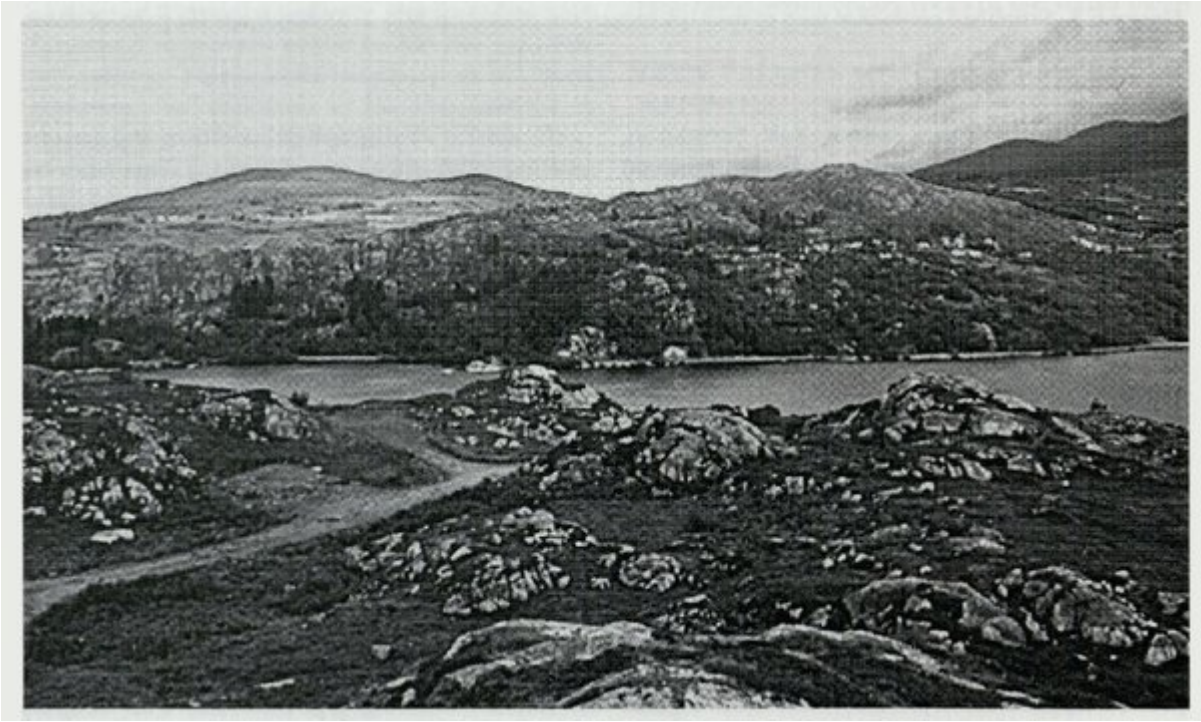
(Figure 6.2) Geological map and locality index to the St David's site (based on the British Geological Survey Sheet 209, St David's 1:50 000 provisional sheet). Localities referred to in the text are in bold.

(Figure 6.3) Well-bedded, possible airfall tuffs overlain by basalt lava; Treginnis Group east of Pen Dal-aderyn, St David's Peninsula, Pembrokeshire. (Photo: J.C.W. Cope.)

(Figure 6.4) Unconformable contact between the St David's Granophyre (Precambrian) below and conglomerates of the Caerfai Group (Cambrian) above, exposed in a farm track to the north-west of Porth Clais, St David's Peninsula, Pembrokeshire. The level of the unconformity lies at the position of the hammerhead. (Photo: S. Howells.)

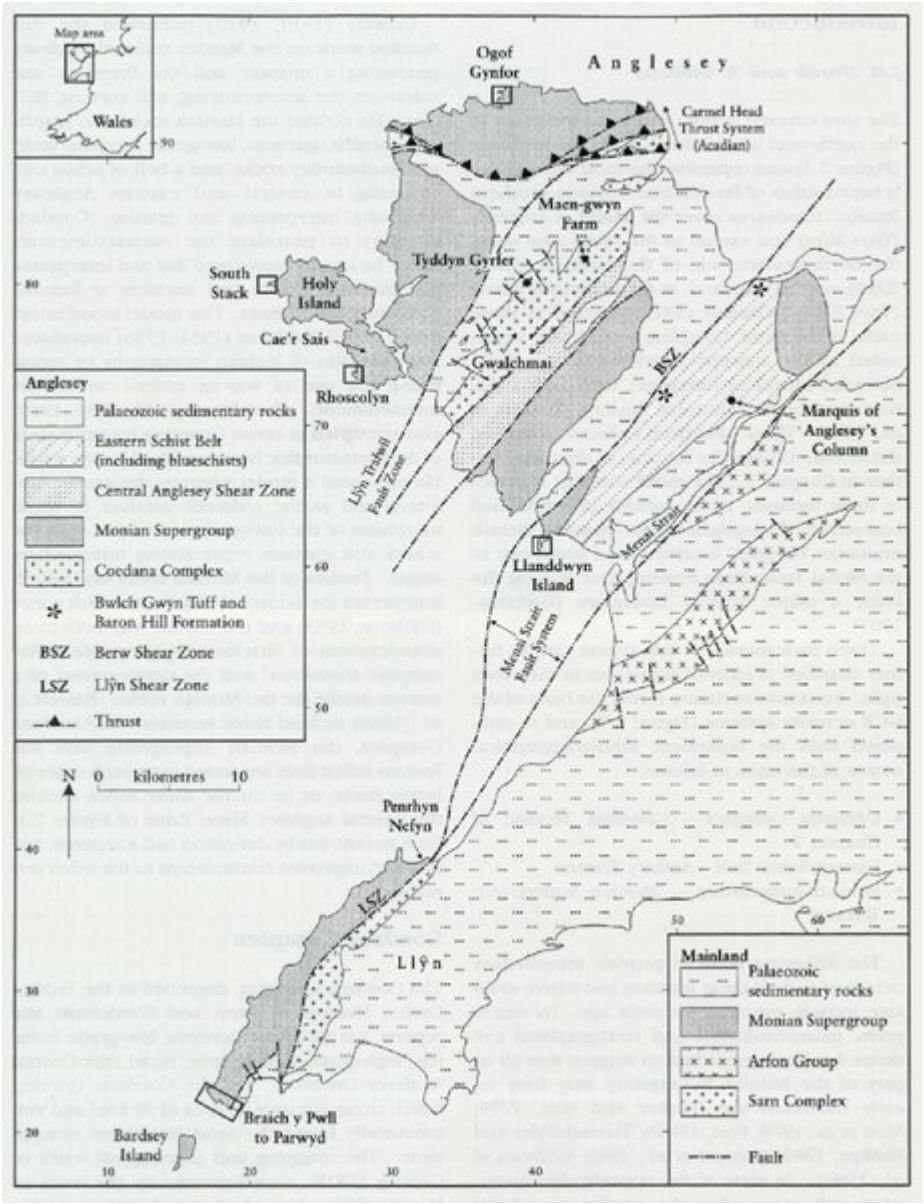


(Figure 6.5) Simplified geological map of the Llyn Padarn site (based on BGS 1: 25 000 maps for parts of Sheets SH55 and SH56)

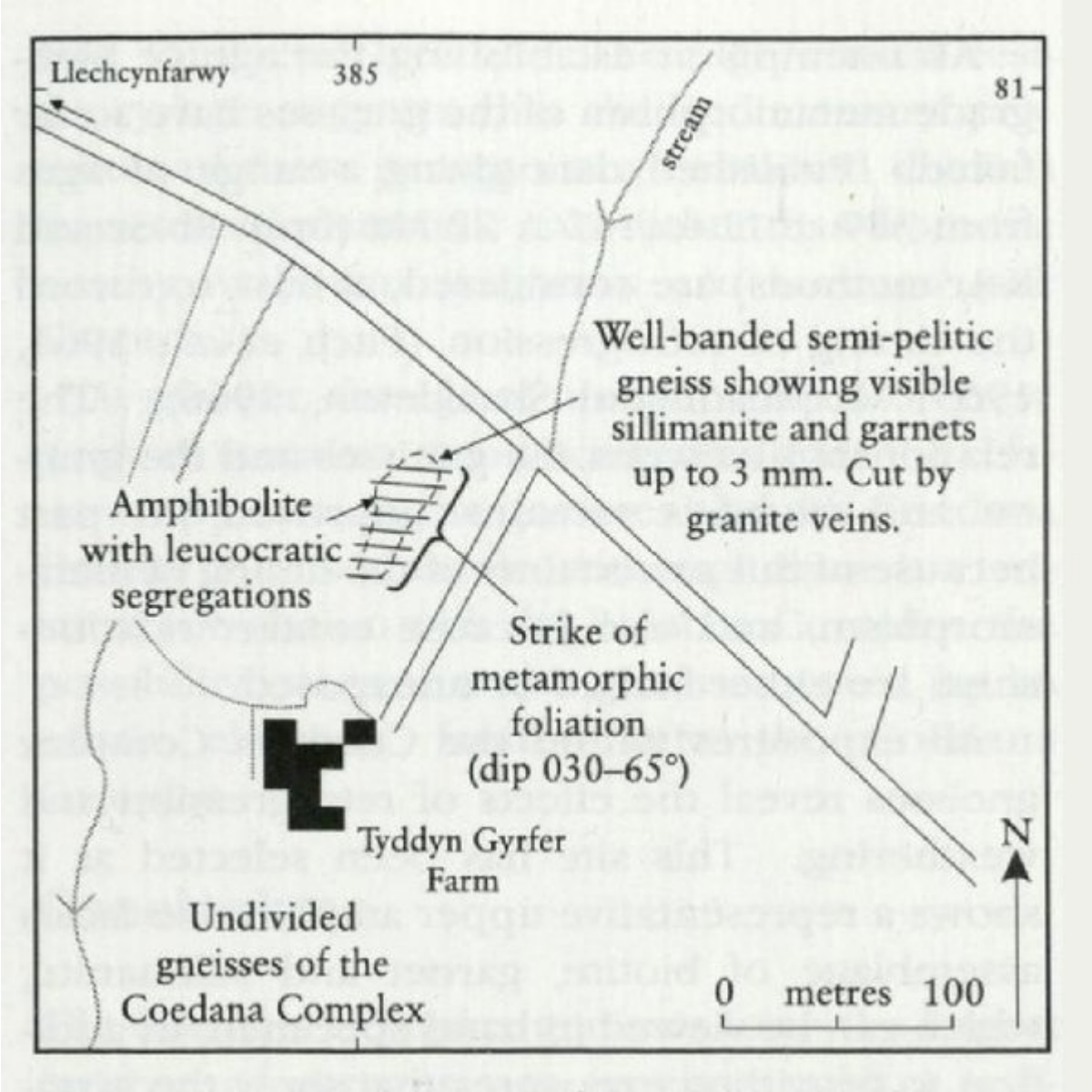


(Figure 6.6) View to the north-east across Llyn Padarn with numerous outcrops of the Padarn Tuff Formation in the foreground. (Photo: L2244, reproduced by kind permission of the Director, British Geological Survey, © NERC.)

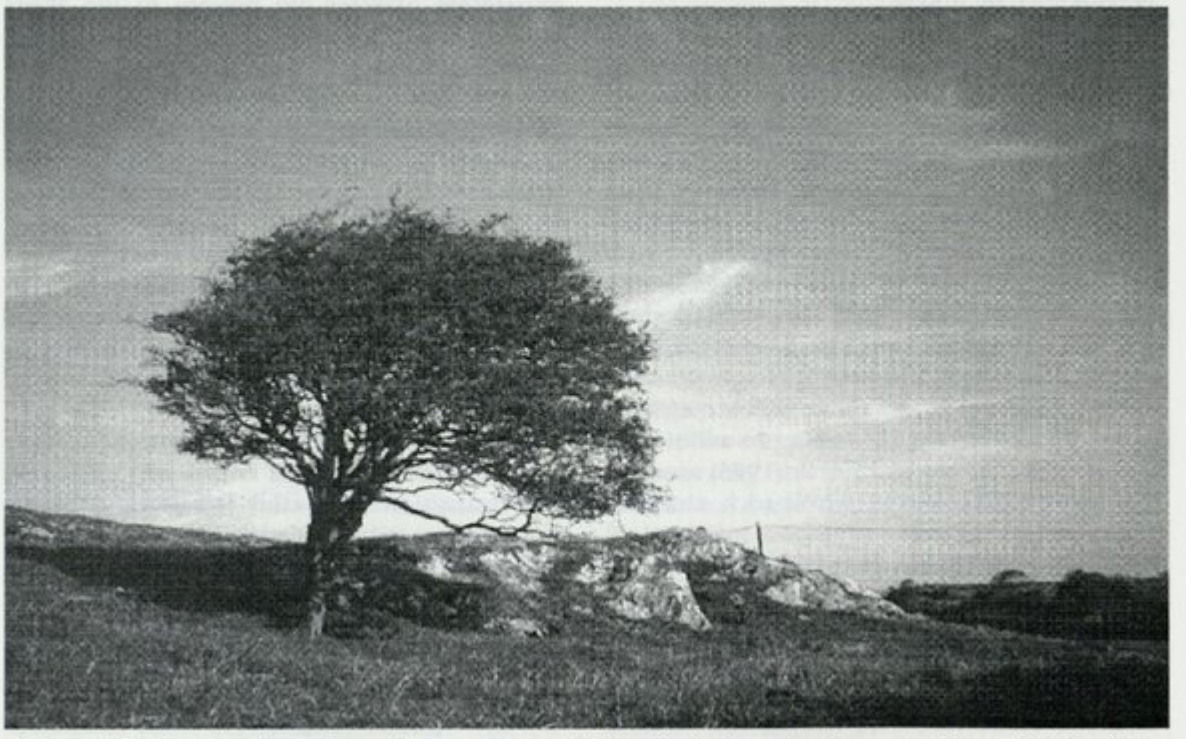
(Figure 6.7) Welded rhyolitic ash-flow tuff of the Padarn Tuff Formation. Elongate dark-coloured fiamme parallel the welding foliation. (Photo: L2501, reproduced by kind permission of the Director, British Geological Survey, © NERC.)



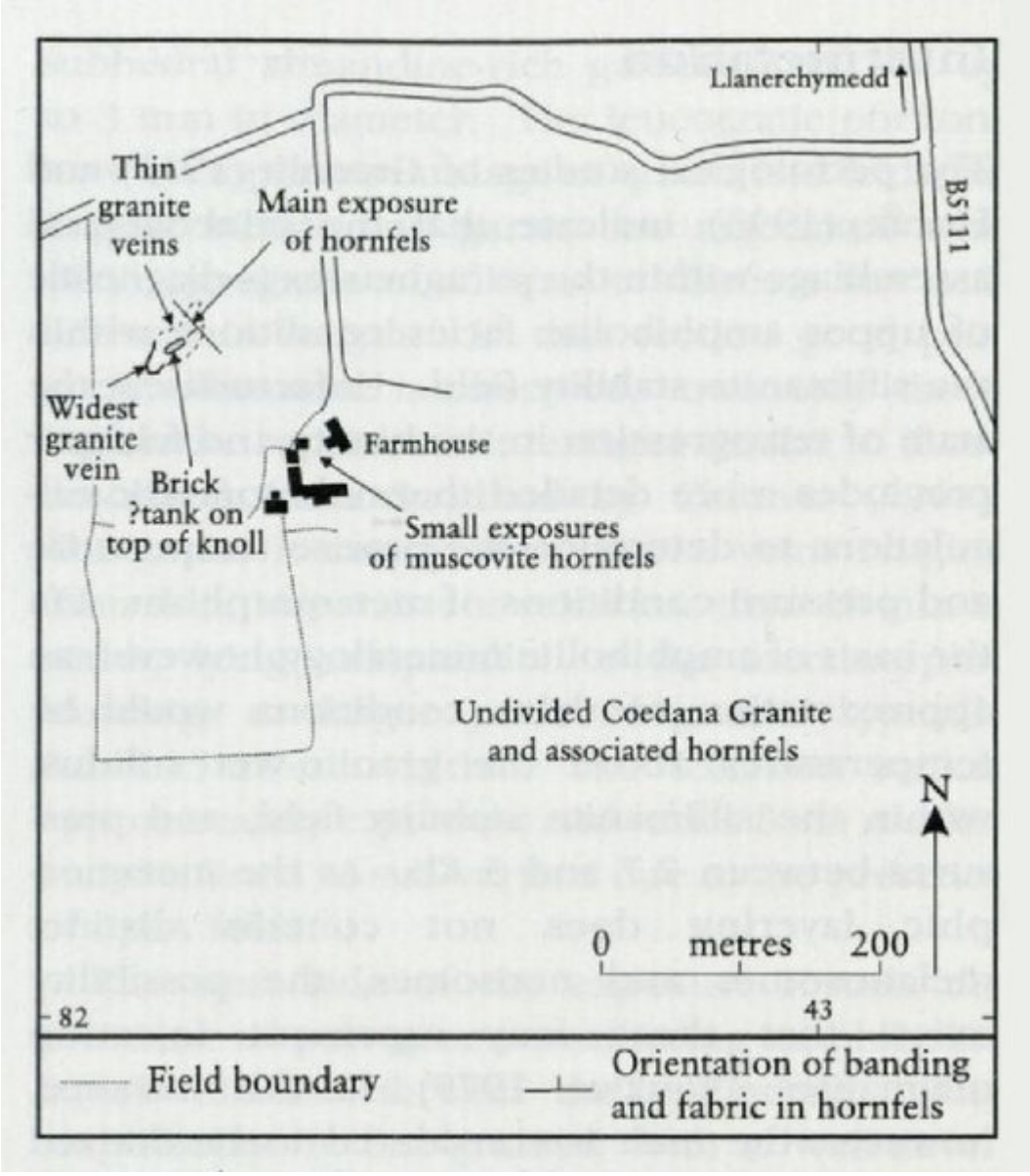
(Figure 7.1) Geological map showing simplified geology and location of GCR sites (bold lettering) in the Anglesey–Llŷn region.



(Figure 7.2) Locality map of the Tyddyn Gyrfer site.

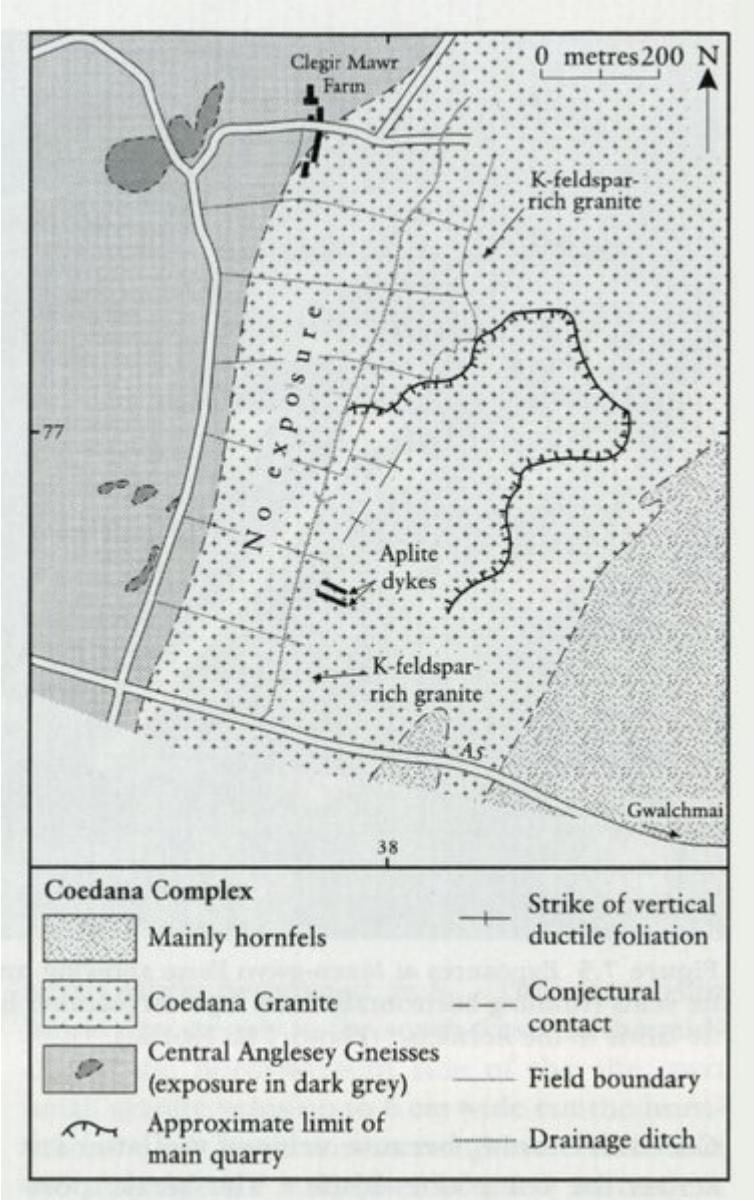


(Figure 7.3) Coedana Complex gneiss exposures at Tyddyn Gyrfer farm, looking east. (Photo: J.M. Horák.)

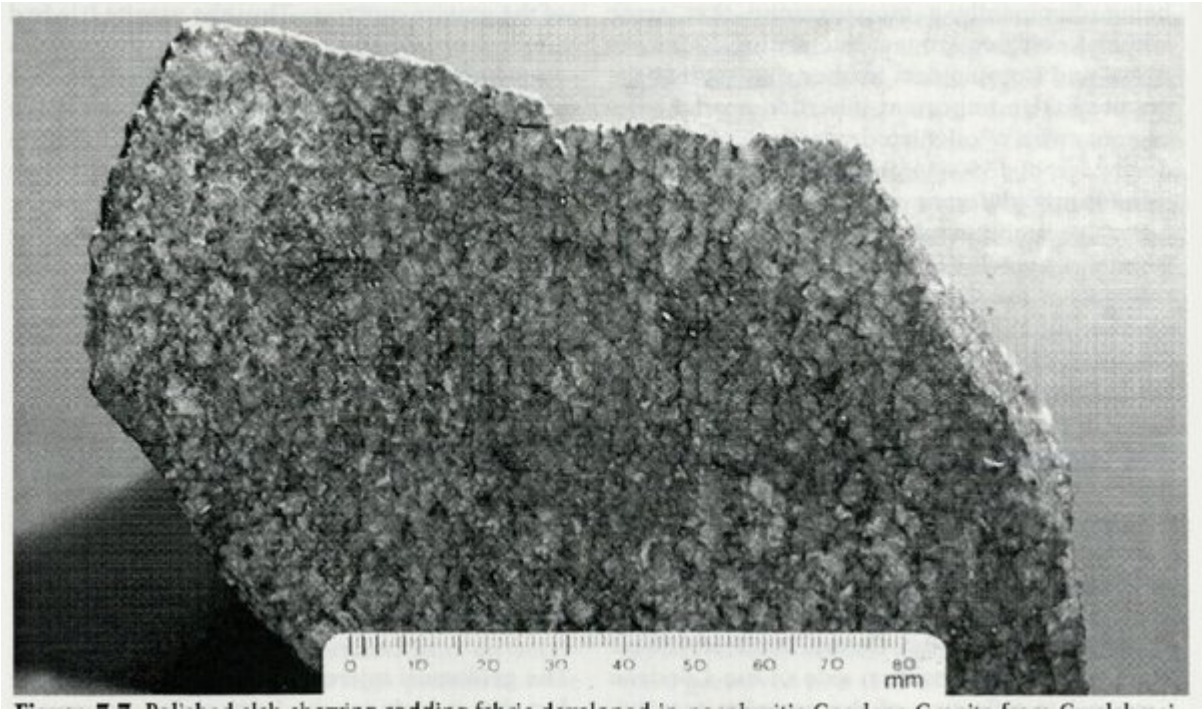


(Figure 7.4) Locality map of the Maen-gwyn Farm site.

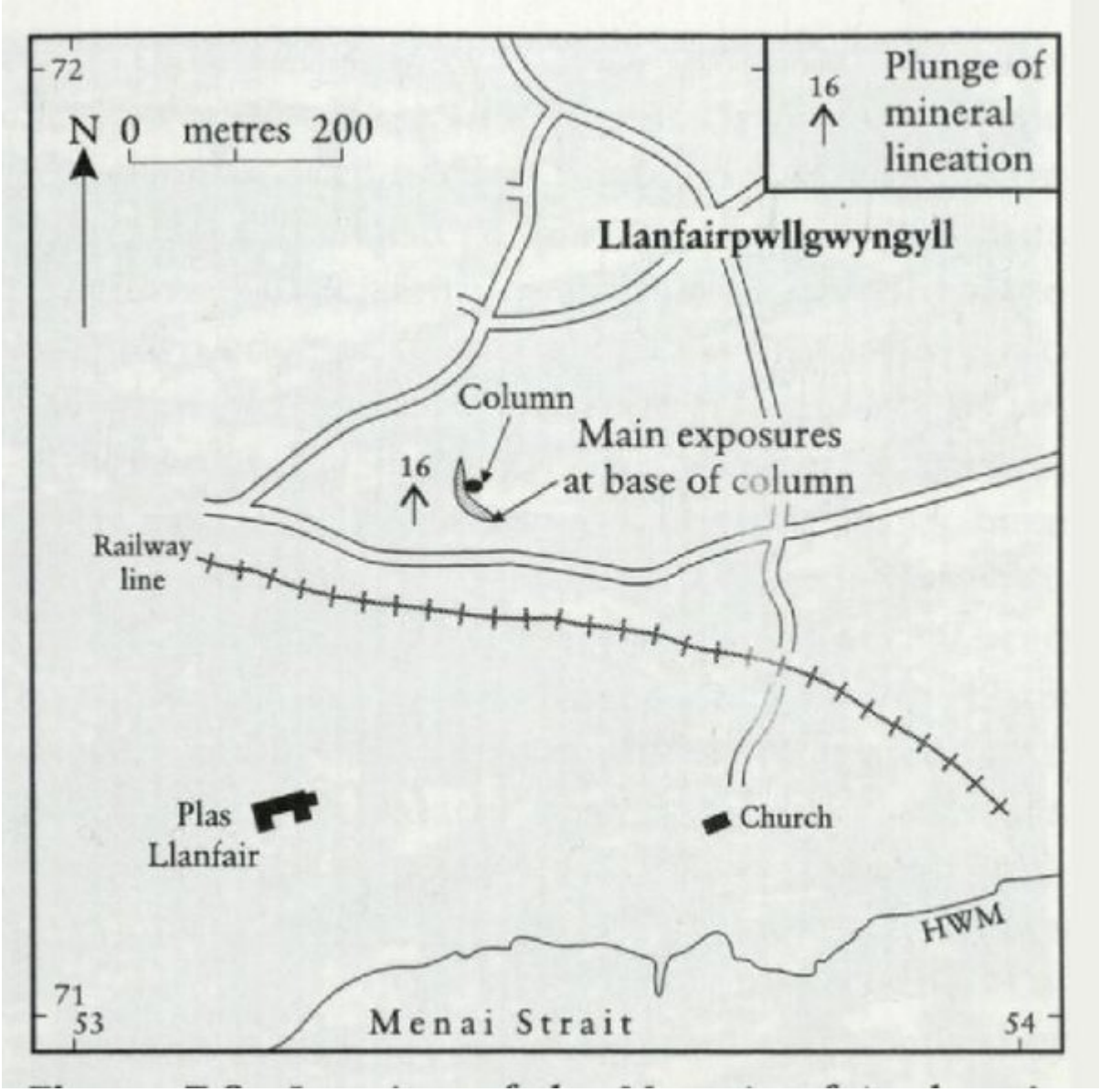
(Figure 7.5) Exposures at Maen-gwyn Farm showing muscovite hornfels of Coedana Complex cut by thin granite veins (running horizontally from tape on hammer handle). The hammer is oriented parallel to the composite fabric in the hornfels. (Photo: J.M. Horák.)



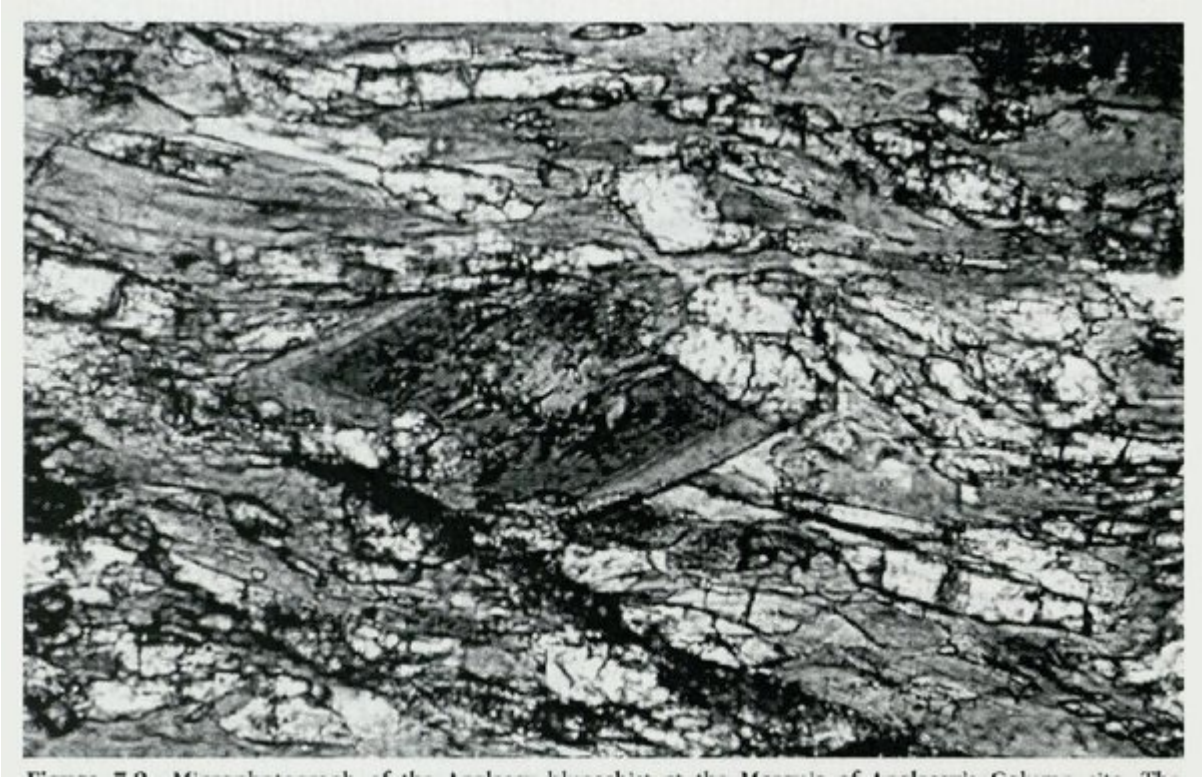
(Figure 7.6) Geological map of the Gwalchmai site.



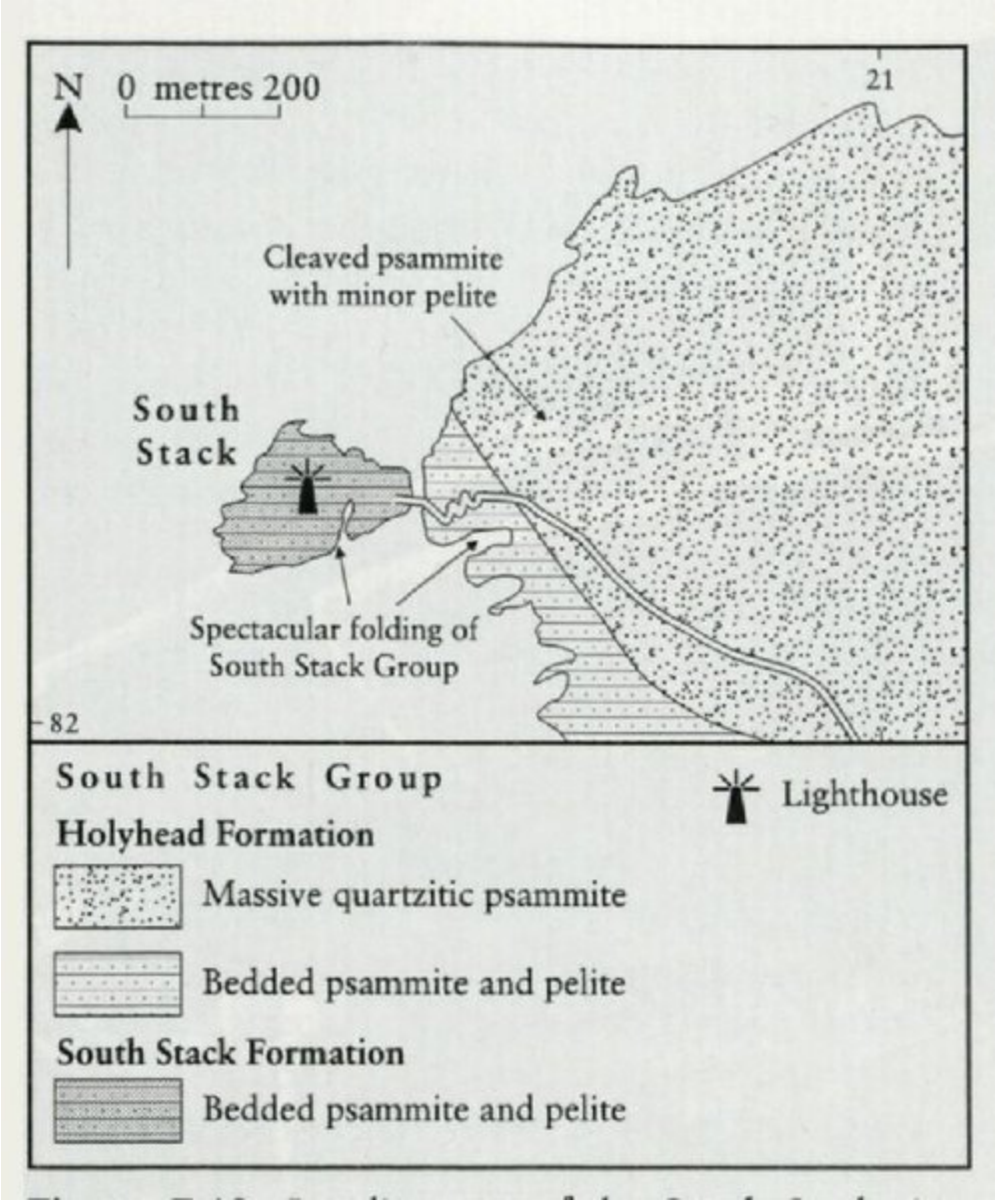
(Figure 7.7) Polished slab showing rodding fabric developed in porphyritic Coedana Granite from Gwalchmai. (Photo: J.M. Horák.)



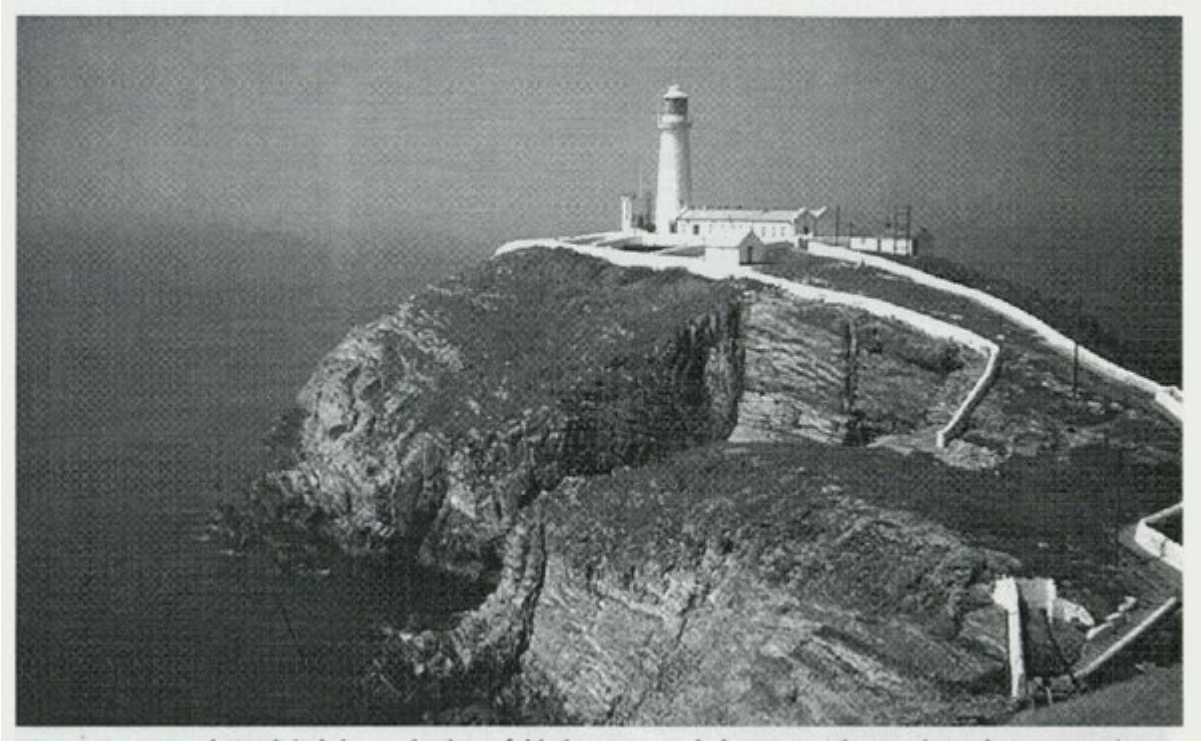
(Figure 7.8) Location of the Marquis of Anglesey's Column site. Note that the area to the north of the railway line is mainly underlain by metabasaltic blueschist with a foliation (not shown) that is flat-lying, varying about the horizontal.



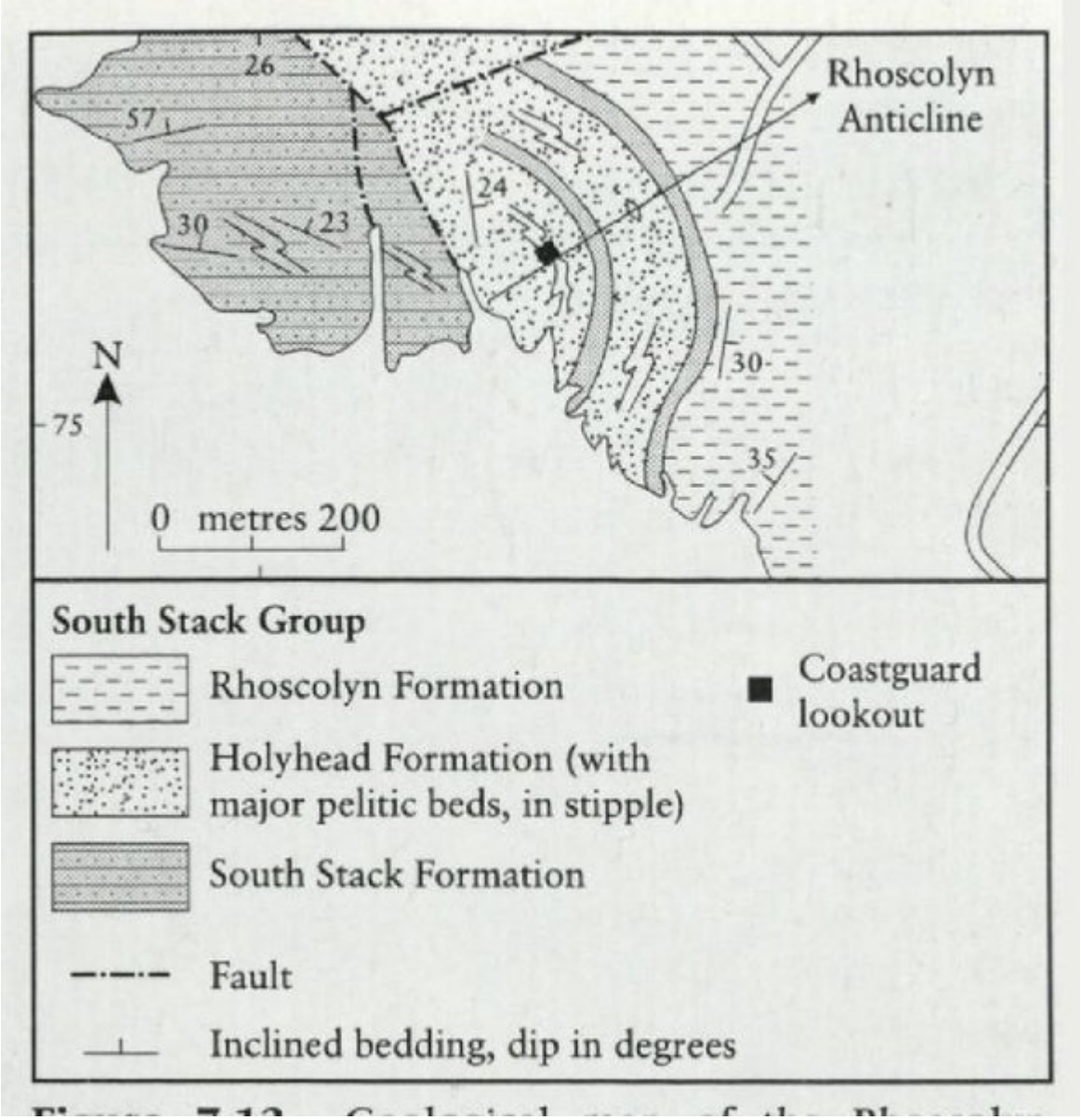
(Figure 7.9) Microphotograph of the Anglesey blueschist at the Marquis of Anglesey's Column site. The blueschist consists of glaucophanic, blue amphibole (pale grey areas) and epidote (white laths). The crystal at the centre has an actinolitic core (pale grey) surrounded by barroisite (darker grey), with the outer pale-toned rim of the crystal being blue glaucophane. (Photo: W. Gibbons.)



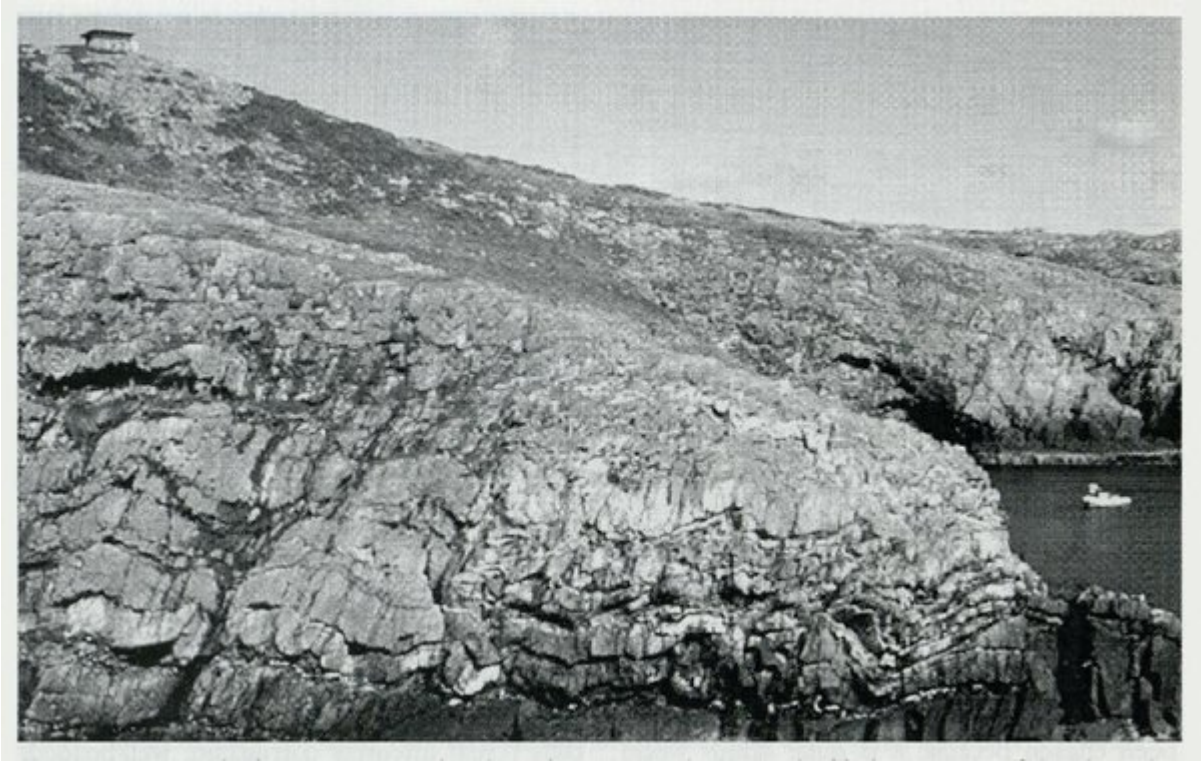
(Figure 7.10) Locality map of the South Stack site. After Greenly (1919) and Phillips (1991b).



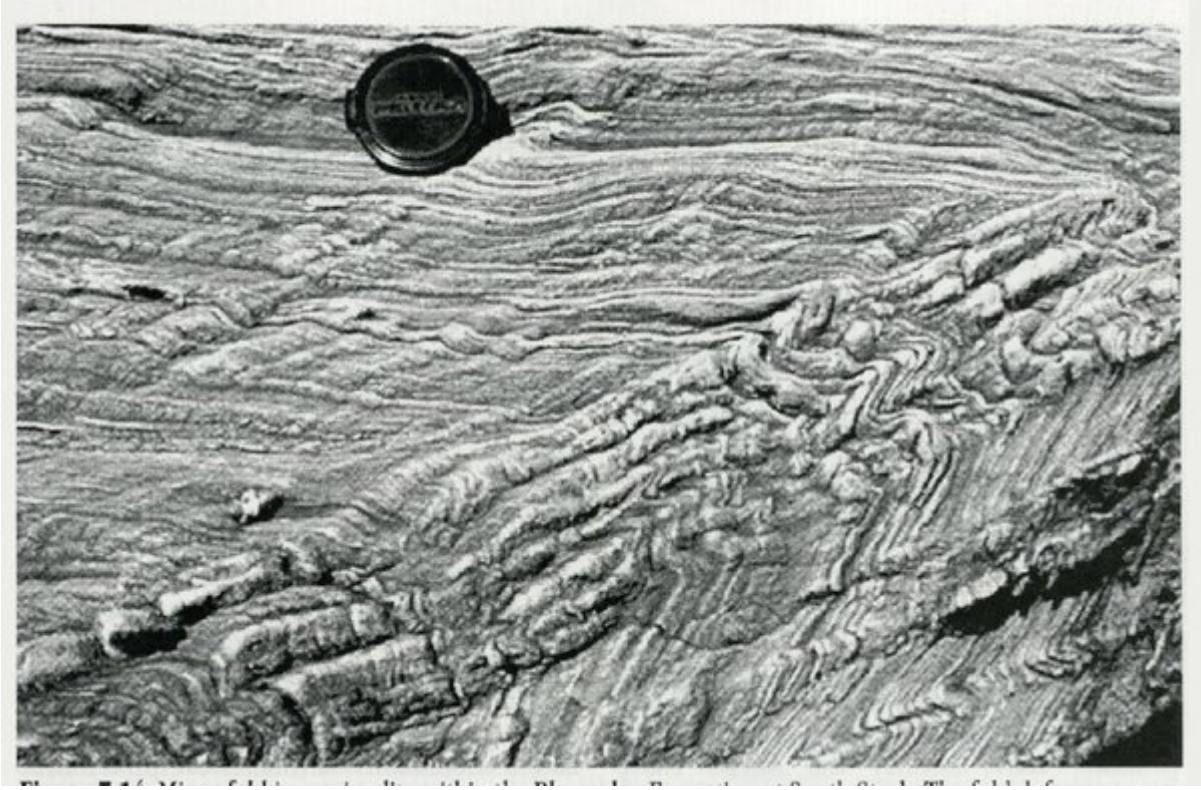
(Figure 7.11) South Stack lighthouse built on folded psammites belonging to the South Stack Group. (Photo: W. Gibbons.)



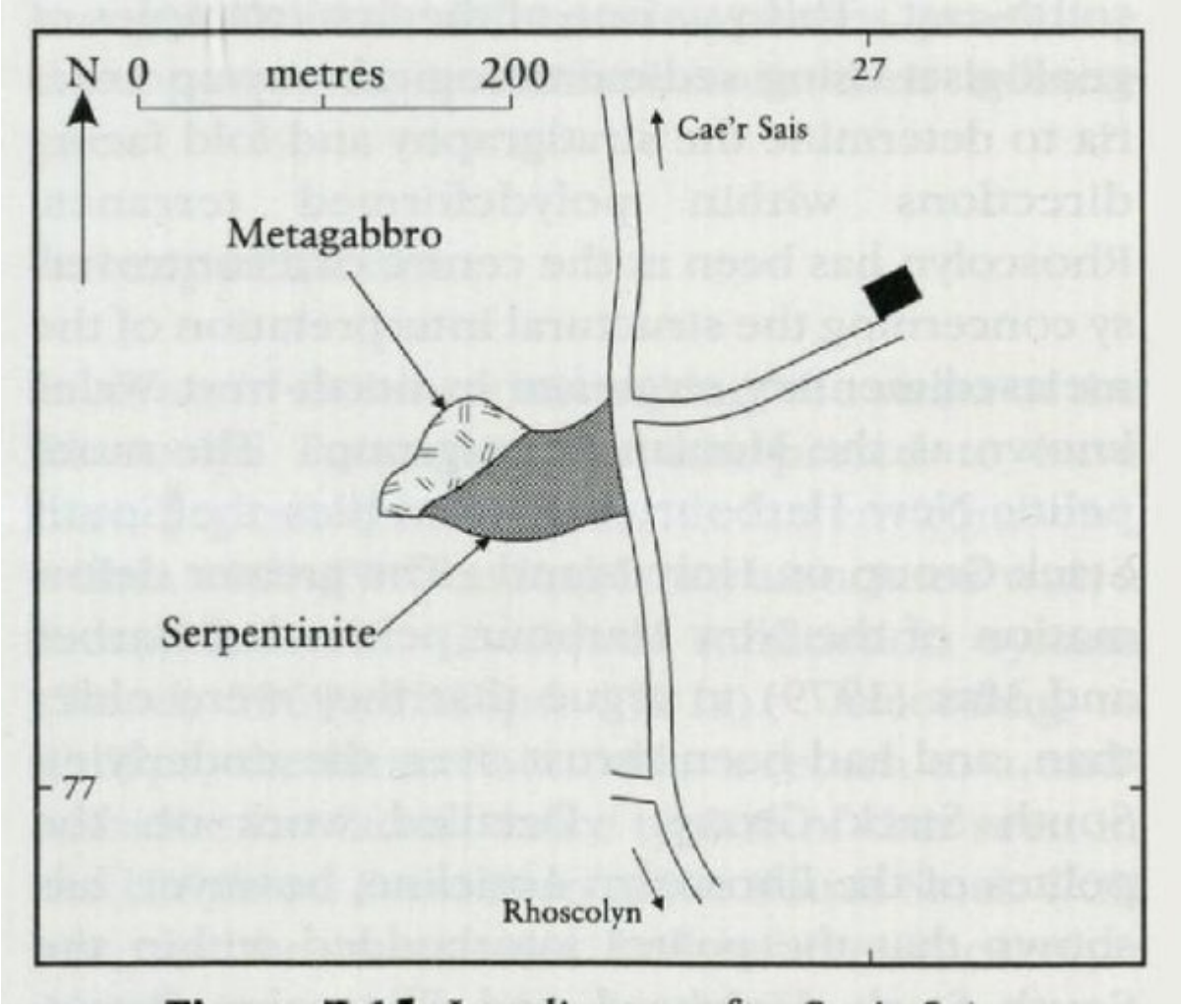
(Figure 7.12) Geological map of the Rhoscolyn Anticline. Modified from Phillips (1989, fig. 4.24)



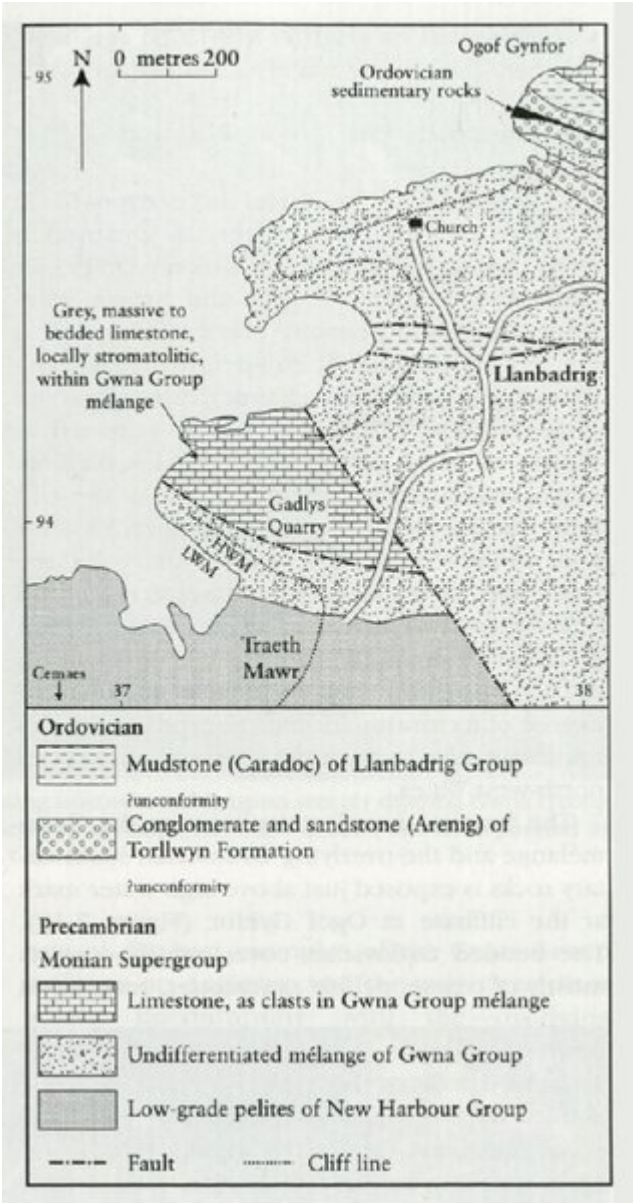
(Figure 7.13) View looking east across the Rhoscolyn site. Gently dipping bedded psammites of the Rhoscolyn Formation (South Stack Group) on the north-western limb of the Rhoscolyn Anticline showing minor folds and steeply NW-dipping cleavage. The core of the anticline runs beneath the Coastguard Lookout (top left) from which the beds dip south-eastwards to the sea. (Photo: W Gibbons.)



(Figure 7.14) Minor fold in semi-pelite within the Rhoscolyn Formation at South Stack. The fold deforms an earlier cleavage (usually designated S3) and a new pressure-solution spaced cleavage can be seen developing axial planar to the fold. (Photo: W Gibbons.)

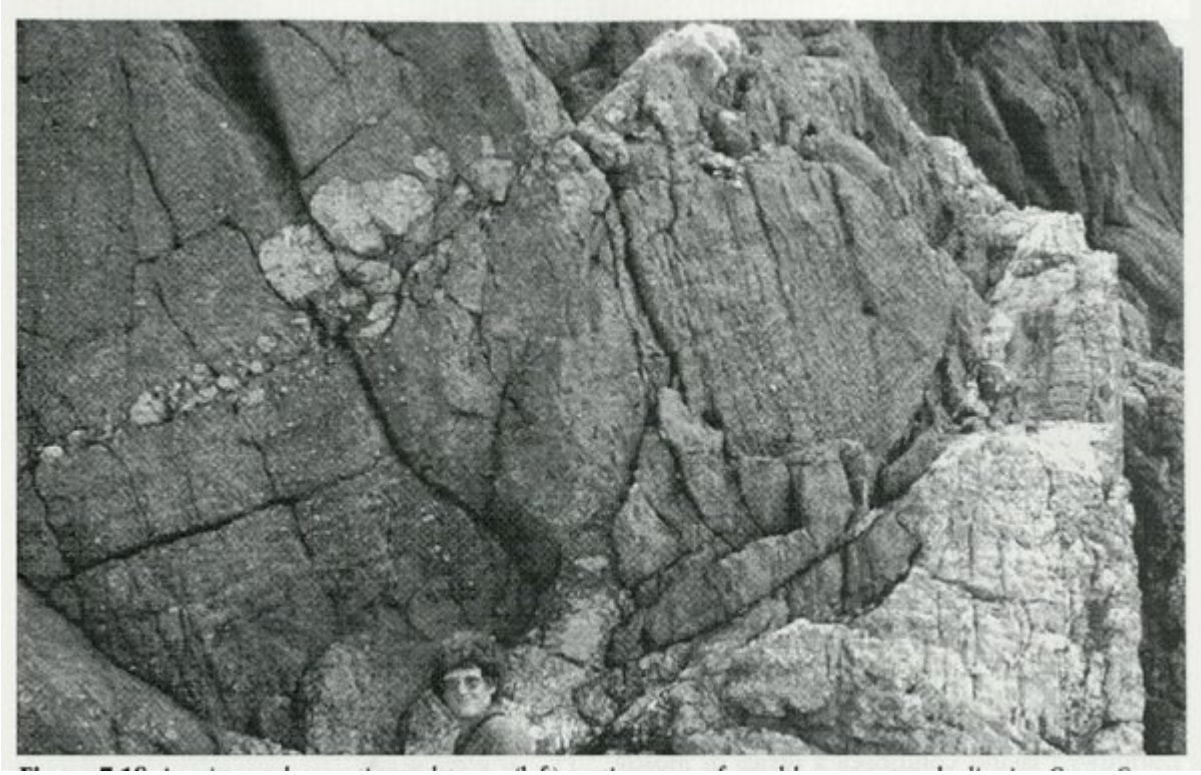


(Figure 7.15) Locality map for Cae'r Sais.

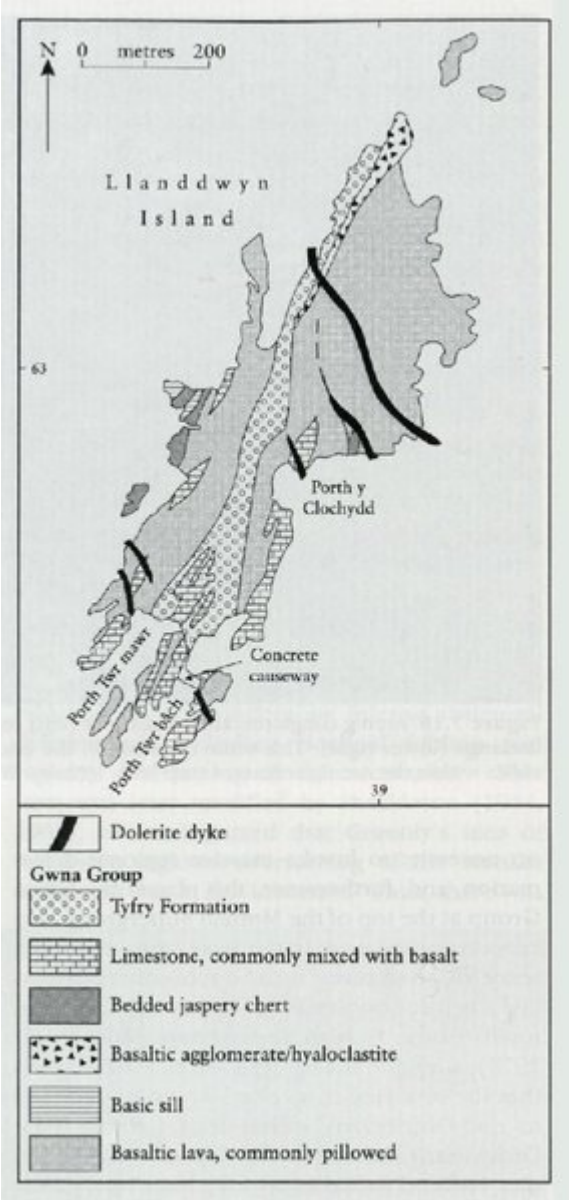


(Figure 7.16) Locality map for the Ogof Gynfor Coast site.

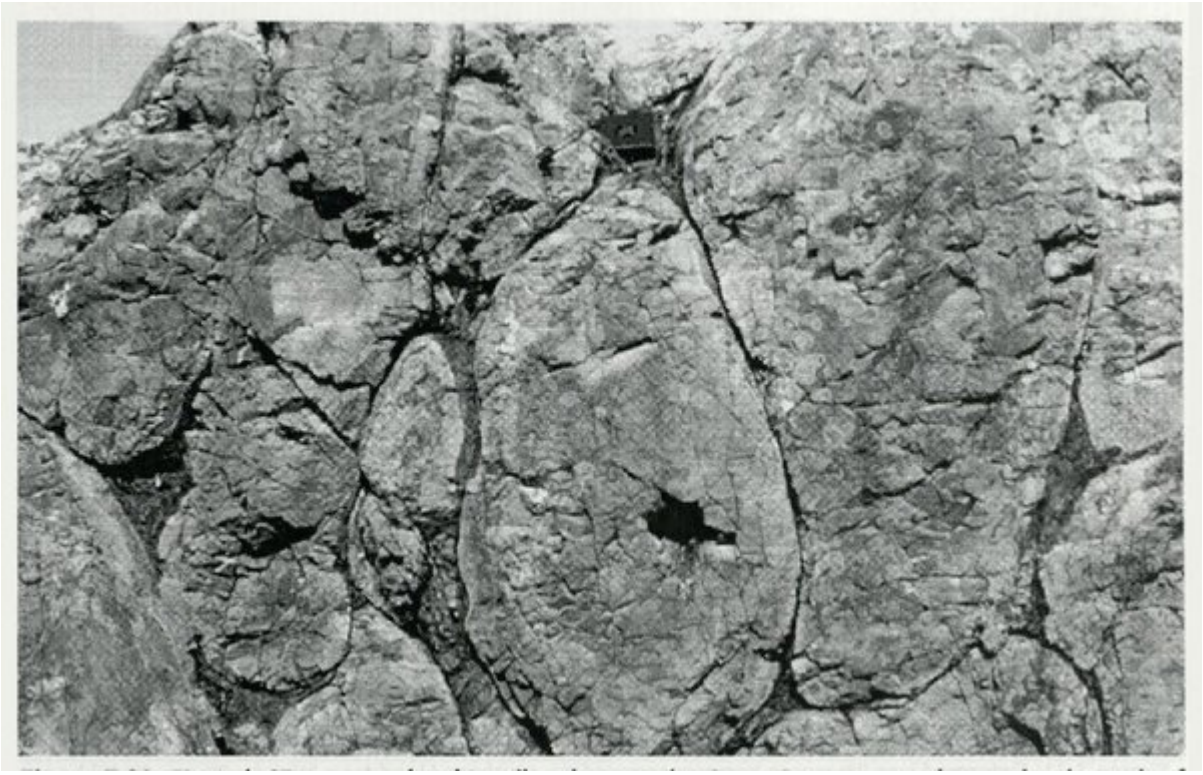
(Figure 7.17) Banded stromatolitic limestone within the Gwna Group from the coastal exposures west of Gadlys Quarry (Photo: W Gibbons.)



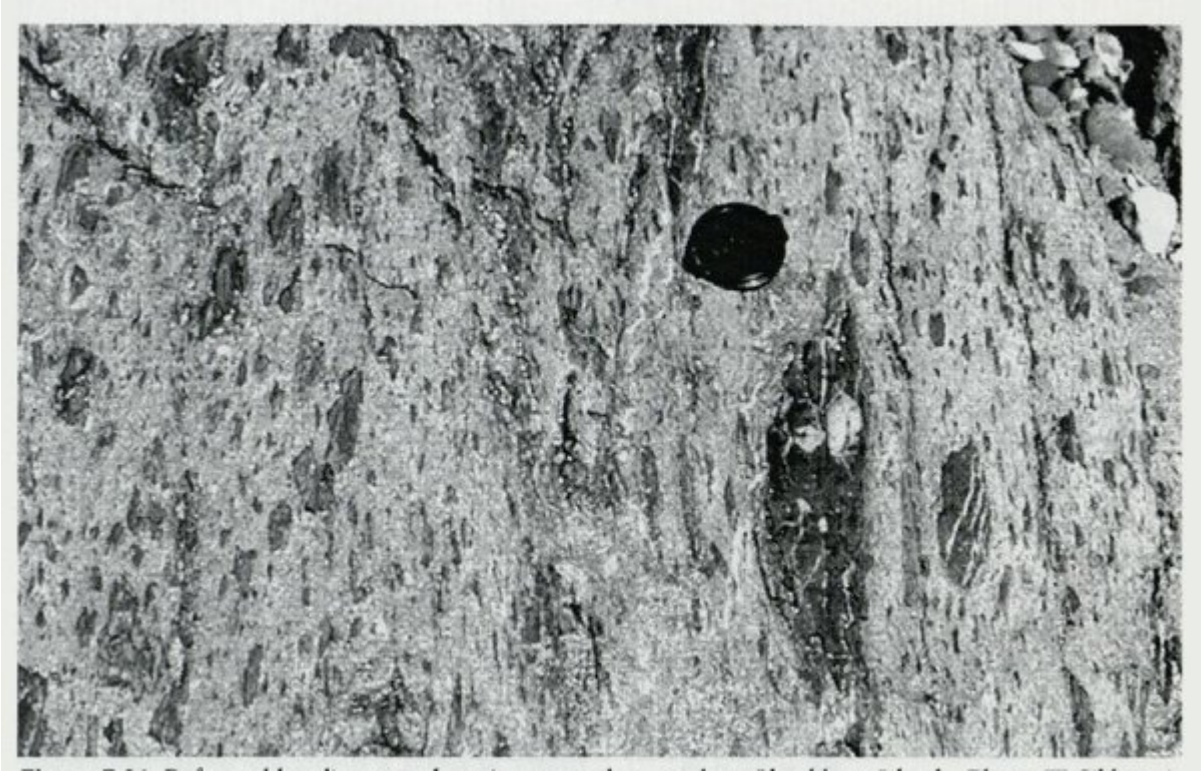
(Figure 7.18) Arenig conglomeratic sandstones (left) resting unconformably upon steeply dipping Gwna Group mélange (lower right). The white quartzite in the underlying mélange has been eroded and incorporated as clasts within the Arenig sediment (top left). (Photo: W. Gibbons.)



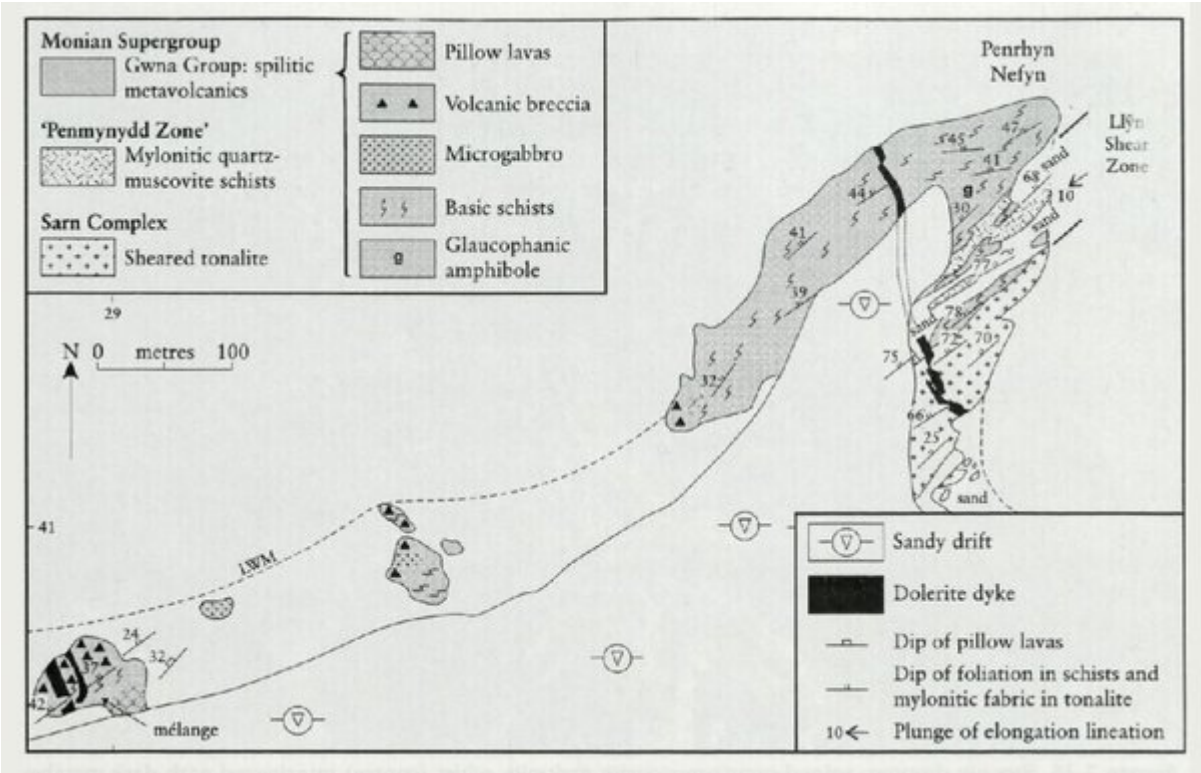
(Figure 7.19) Geological map of Llanddwyn Island.



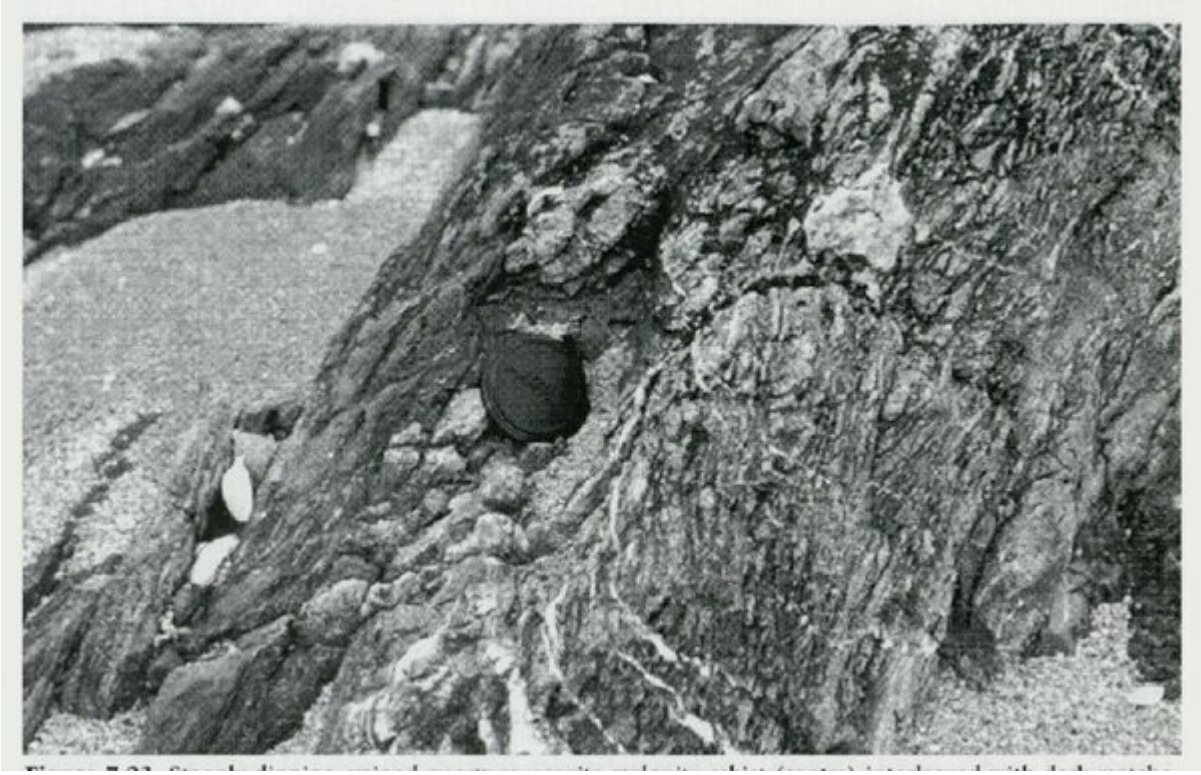
(Figure 7.20) Vertical, SE-younging basaltic pillow lavas in the Gwna Group exposed immediately north of Llanddwyn Island. (Photo: W. Gibbons.)



(Figure 7.21) Deformed lava-limestone breccias exposed on southern Llanddvvyn Island. (Photo: W Gibbons.)

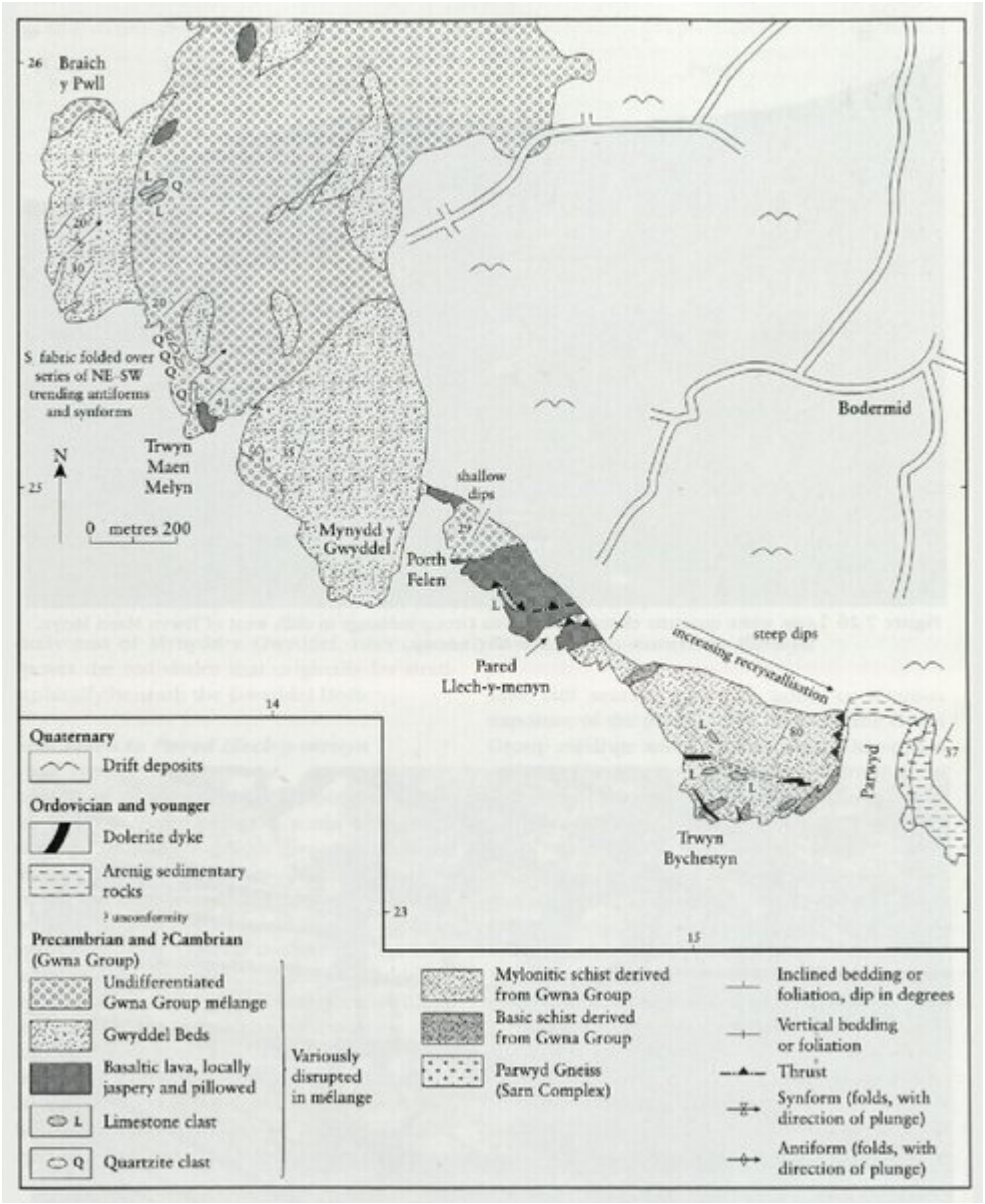


(Figure 7.22) Geological map of Penrhyn Nefyn.

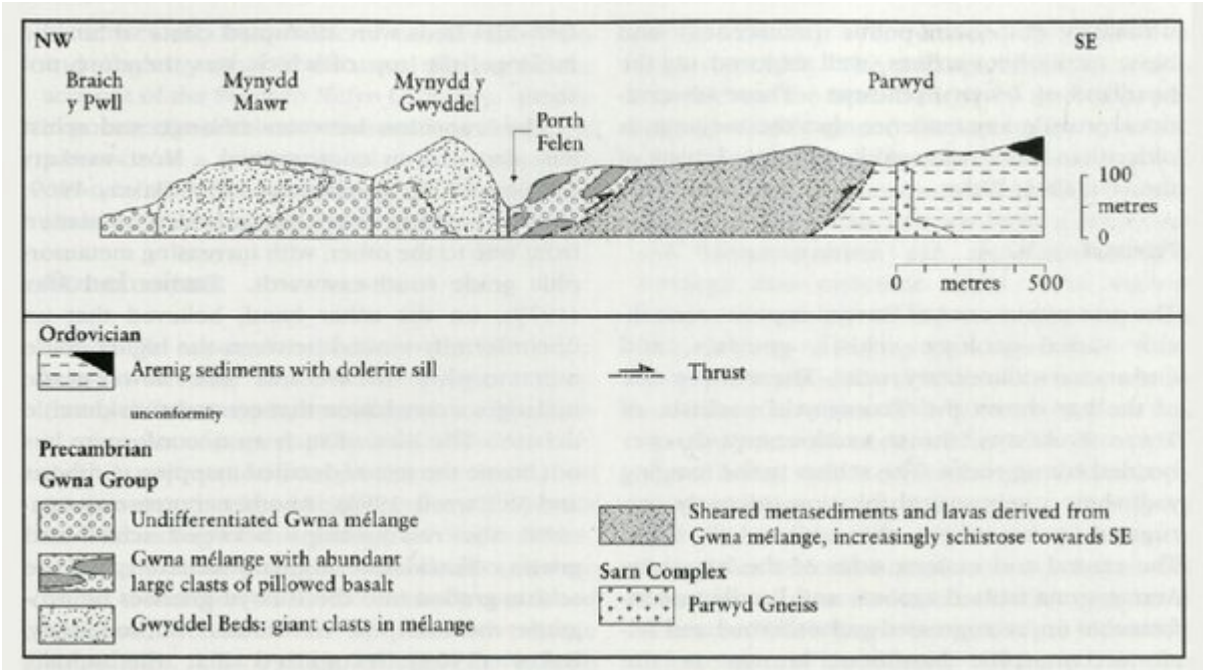


(Figure 7.23) Steeply dipping, veined quartz-muscovite mylonite schist (centre) interleaved with dark metaba-site derived from Gwna Group basalts (left). (Photo: W. Gibbons.)

(Figure 7.24) Remnants of coarse-grained plutonic igneous texture in sheared Sarn Complex tonalite on foreshore at Penrhyn Nefyn. (Photo: W. Gibbons.)



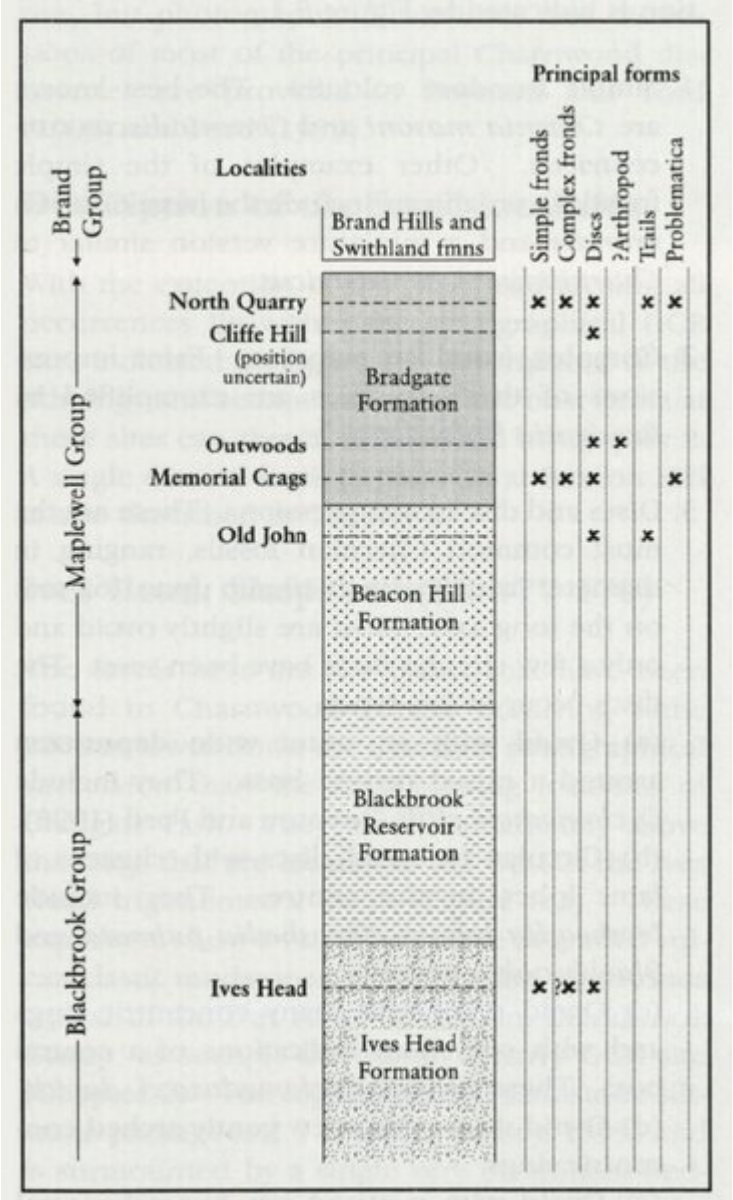
(Figure 7.25) Geological map of the south-west L/■n, Braich y Pwll to Parwyd site. For cross section, see (Figure 7.28)



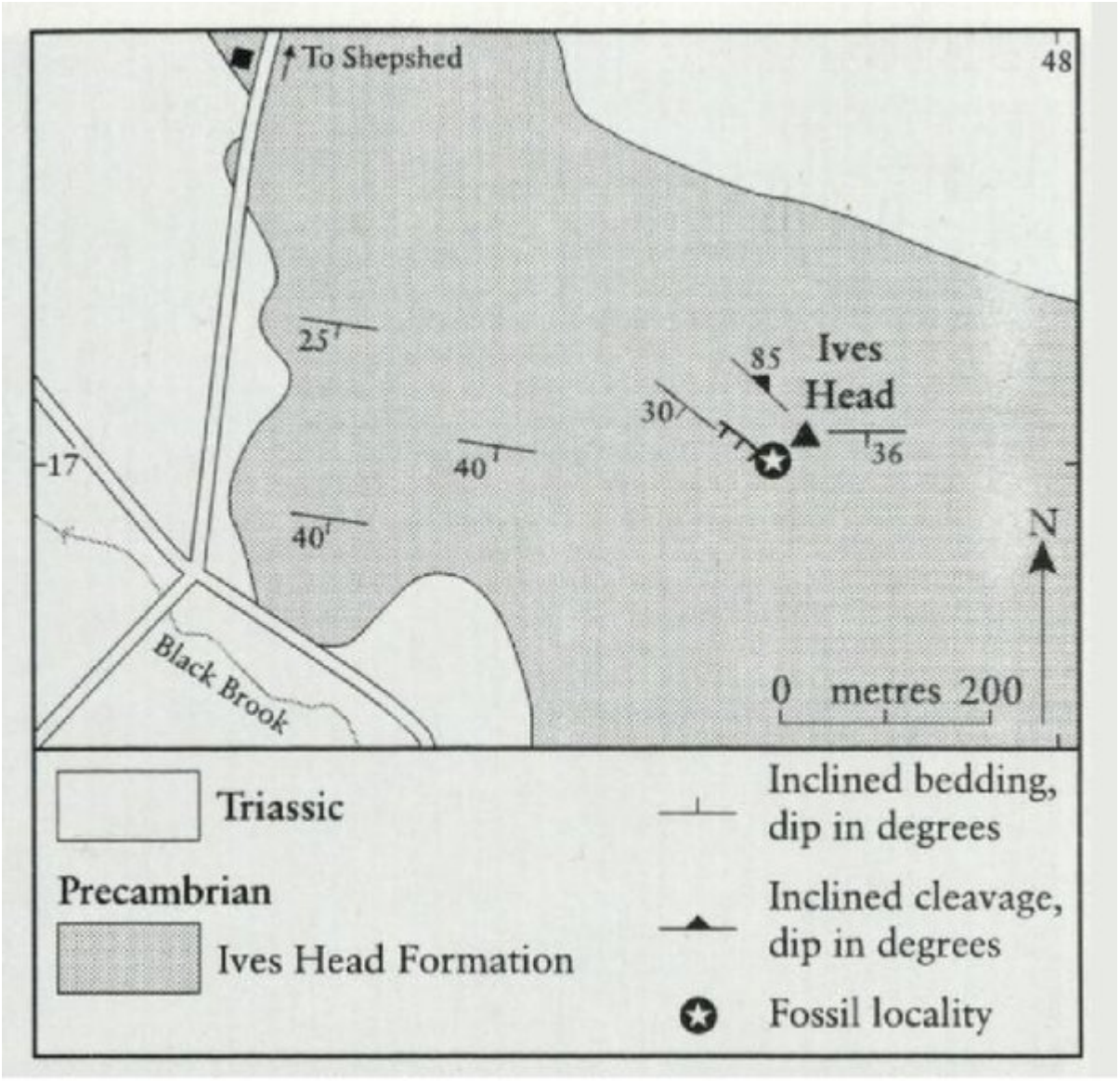
(Figure 7.28) Geological cross-section (see (Figure 7.25)): Braich y Pwll to Parwyd (looking north-east).

(Figure 7.26) Large white quartzite clasts within Gwna Group mélange in cliffs west of Trwyn Maen Melyn.

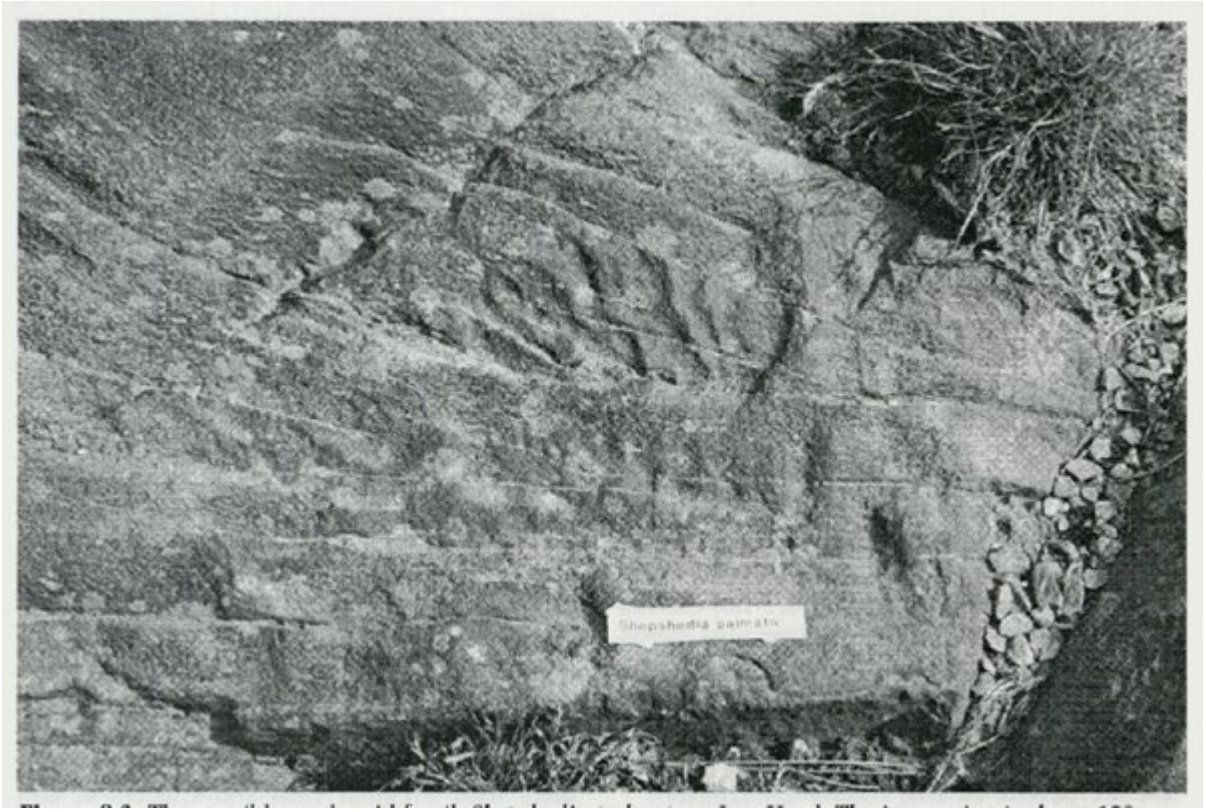
(Figure 7.27) Early recumbent folds in `Gwyddel Beds' south of Braich y Pwll. (Photo: W. Gibbons.)



(Figure 8.1) The range and stratigraphical distribution of fossil forms in Charnwood Forest (the stratigraphi-cal thicknesses shown are not to scale).

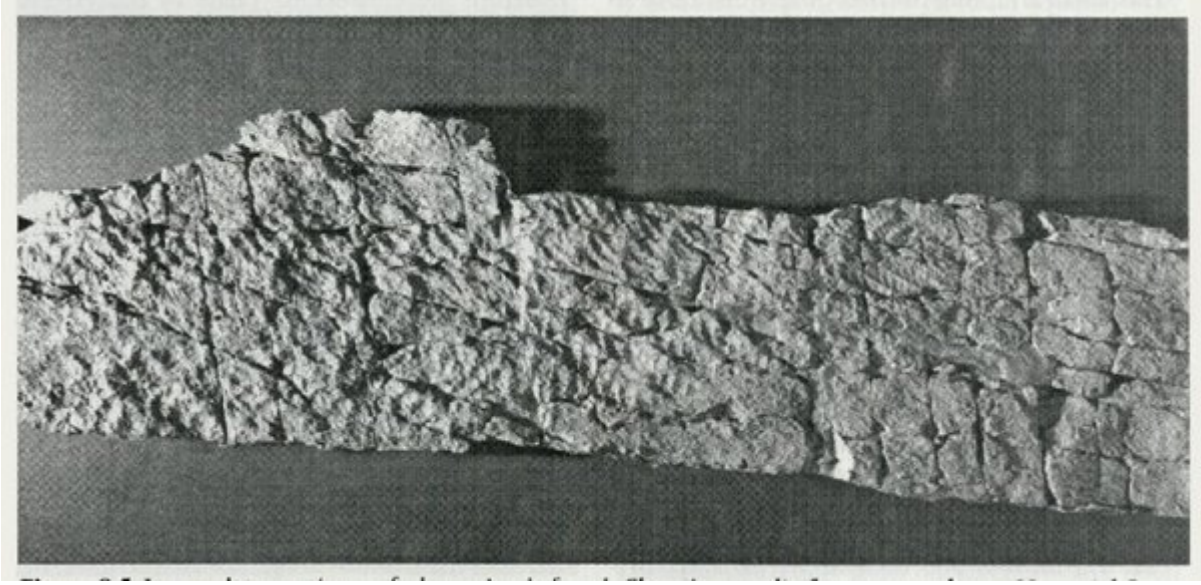


(Figure 8.2) Simplified geological map of the Ives Head fossil locality.

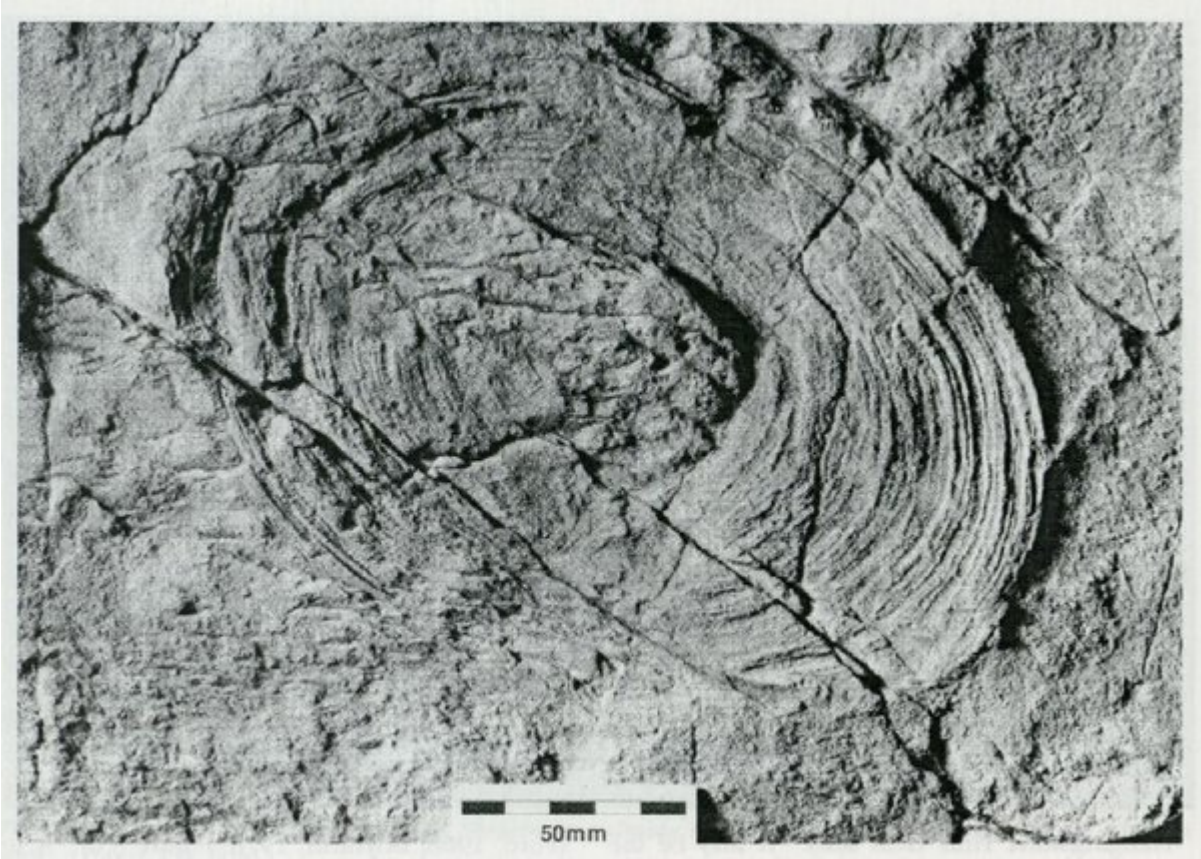


(Figure 8.3) The possible medusoid fossil, Shepshedia palmata at Ives Head. The impression is about 120 mm wide. (Photo: T.D. Ford.)

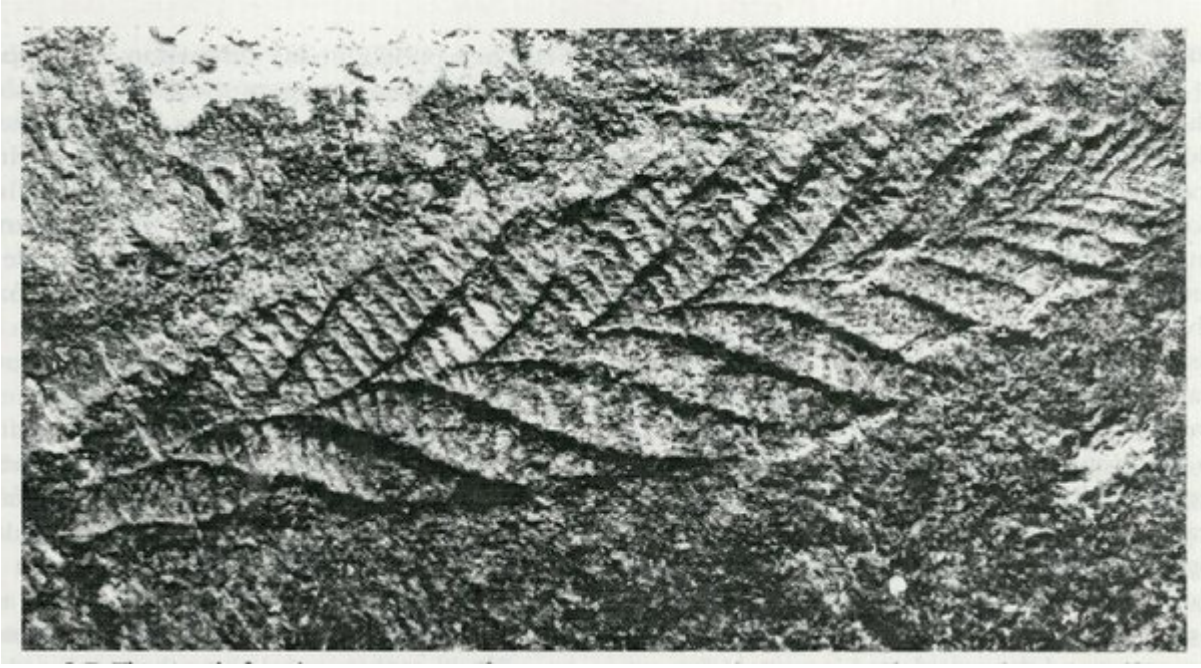
(Figure 8.4) Impression of the complex frondose organism, Bradgatia linfordensis, at the Memorial Crags locality. This specimen is about 100 m wide. Note also, the small ovoid disc-like impression on the left of the photo. (Photo: T.D. Ford.)



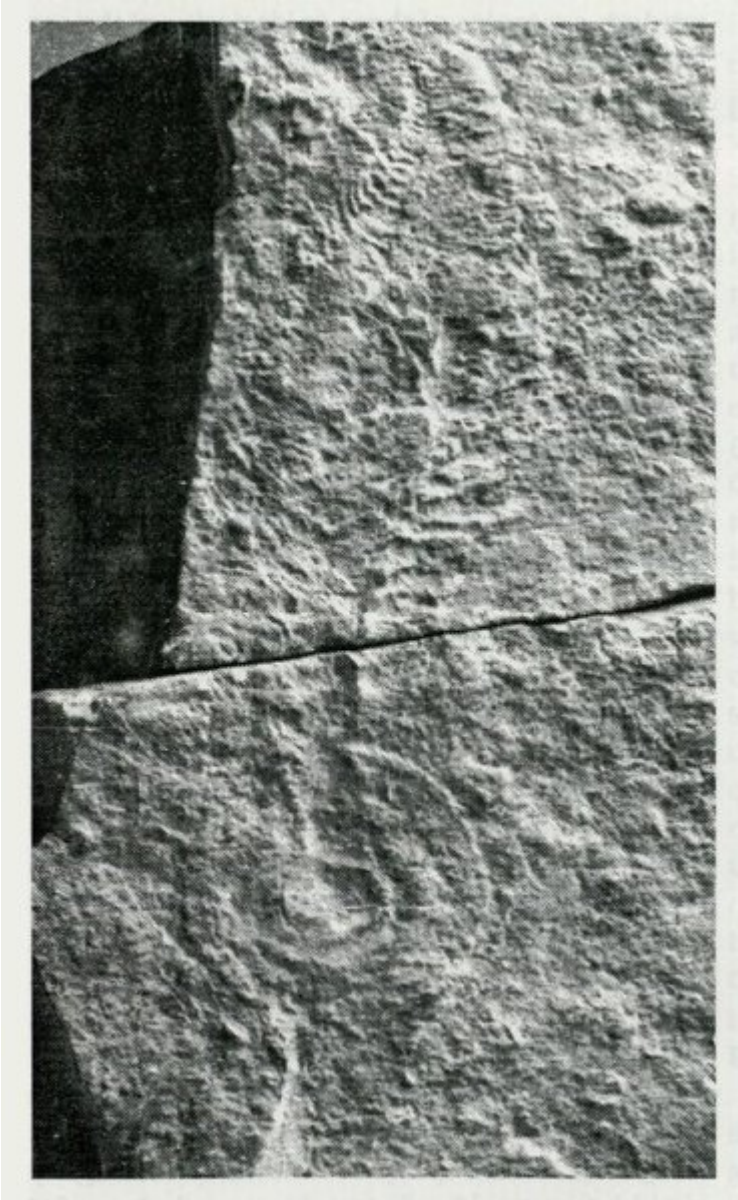
(Figure 8.5) Incomplete specimen of a large simple frond, Charnia grandis, from a cast taken at Memorial Crags. The specimen is 600 mm long. (Photo: T.D. Ford.)



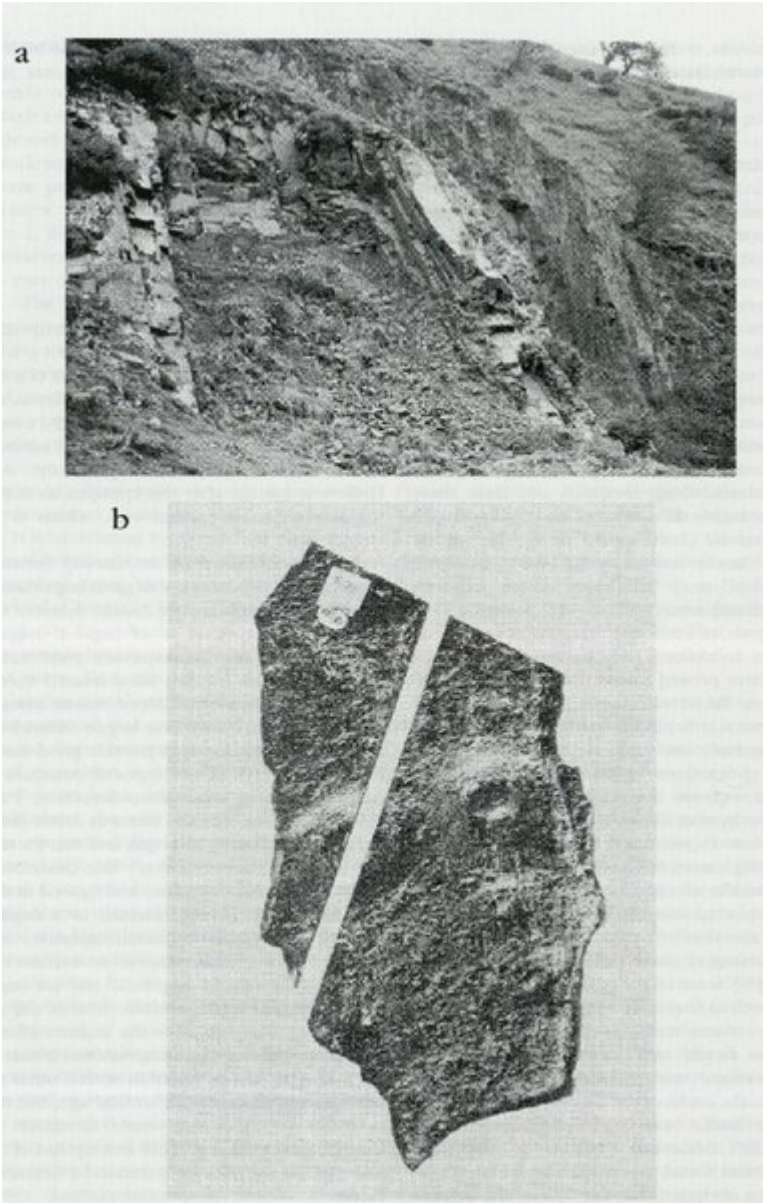
(Figure 8.6) Specimen of the possible medusoid fossil, Cyclomedusa cf. davidi, from the Outwoods locality. The fossil measures 220 x160 mm. (Photo: T.D. Ford.)



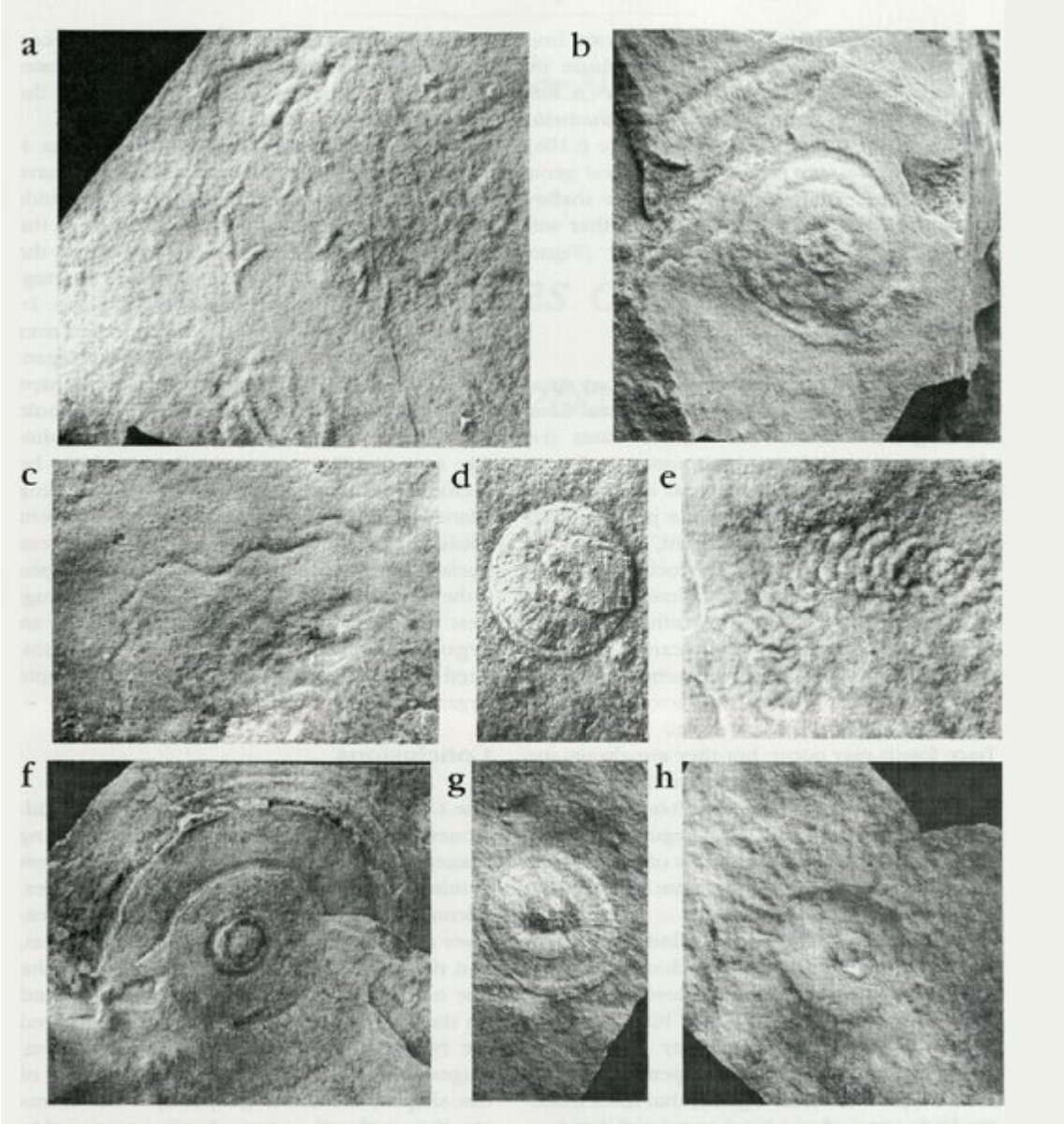
(Figure 8.7) The simple frondose organism, Charna masoni at North Quarry on Charnwood Forest Golf Course. The specimen is 210 mm long. (Photo: T.D. Ford.)



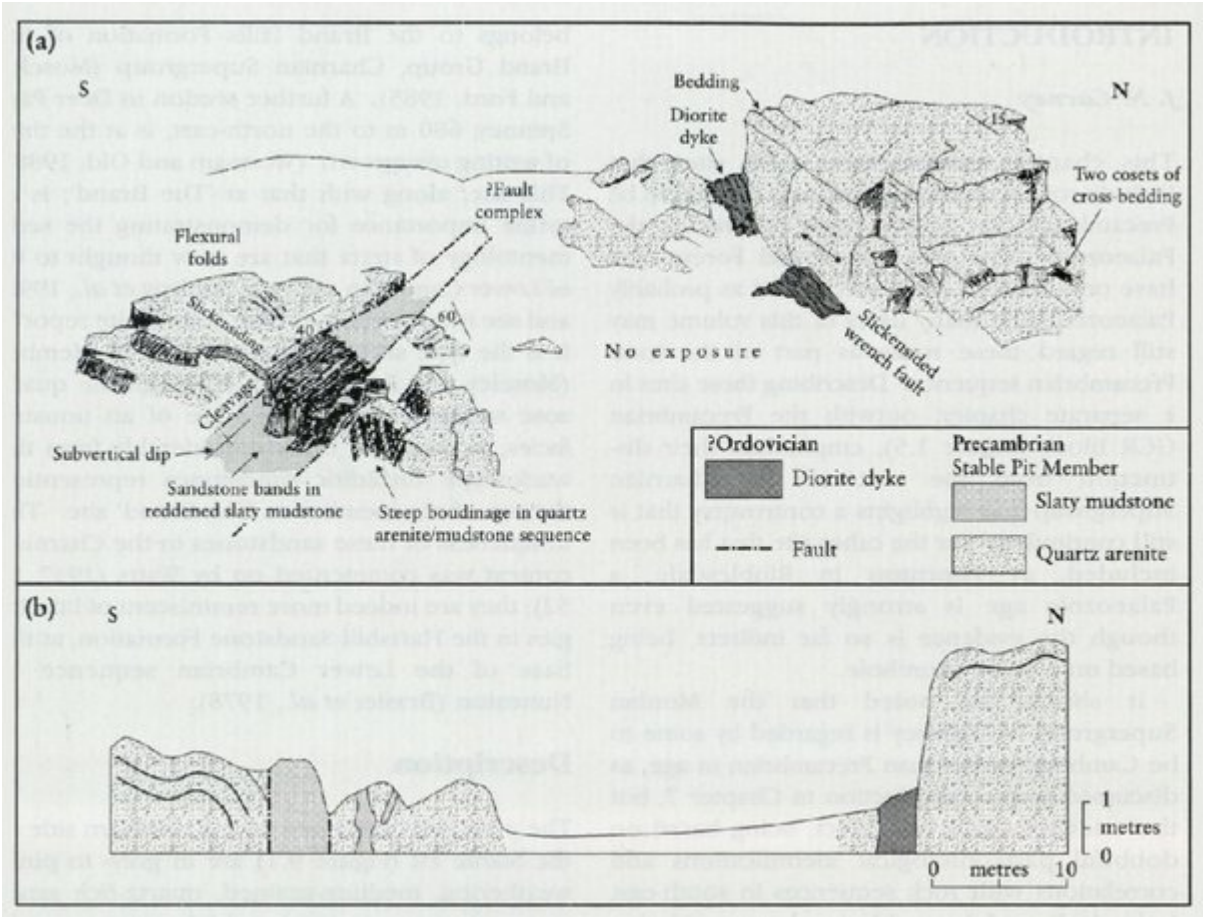
(Figure 8.8) Charniodiscus concentricus from North Quarry. It shows a frond attached to a basal disc, which may either be a `holdfast' or a float. This specimen is 250 mm long and the disc is 64 mm in diameter. (Photo: T.D. Ford.)



(Figure 8.9) The fossiliferous locality at Ashes Hollow. (a) View of Ashes Hollow Quarry looking from the northwest. Note the near vertical dip of the beds, and the well-defined joint planes. The sandstone bed has been quarried in the foreground, leaving siltstones exposed at either side of the pit (Photo: J.C.W. Cope). (b) Specimen from Ashes Hollow, featuring probable organic unidentifiable `medusoid' impressions (Plate 5A of Greig et al., 1968).

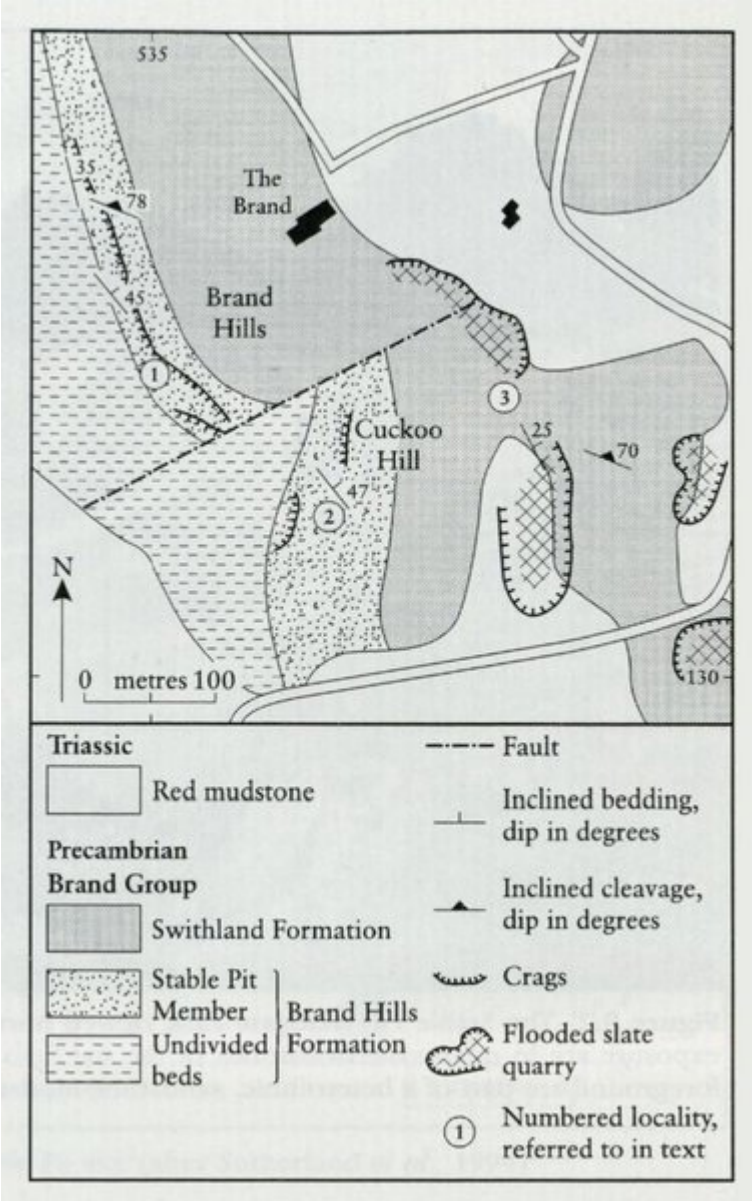


(Figure 8.10) Fossils from Coed Cochion. (a) Shallow branching burrows x 2. (b) Cyclomedusa sp. x 1.5. (c) Cochlichnus sp. X 1.5. (d) Medusinites sp. x 1.5. (e) Palaeopaschichnus sp. a meandering feeding trail or spiral alga x 2. (f) Ediacara sp. x 1. (g) Medusinites sp. x 1.5. (h) Hiemalora sp. a medusoid with ?tentacular impressions x 1.5. (Photos: J.C.W. Cope.)

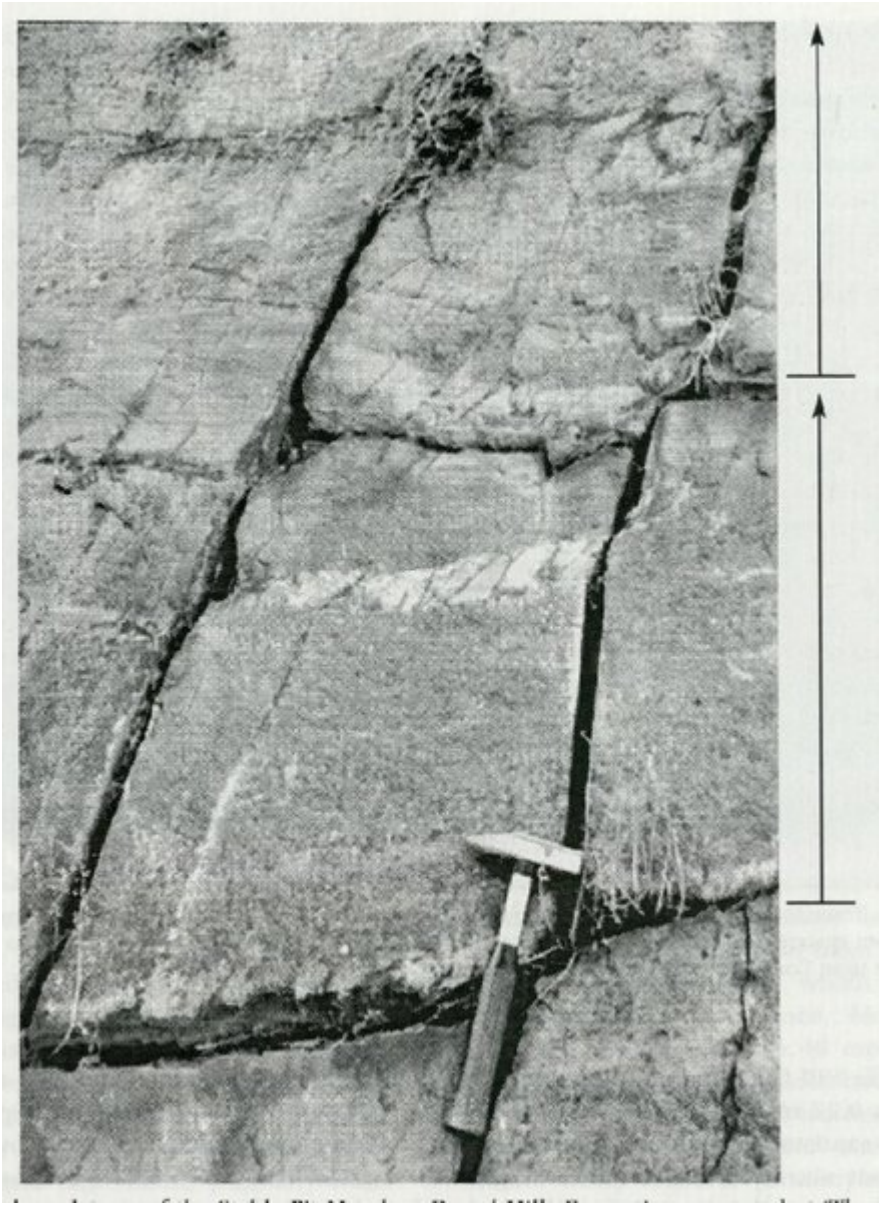


(Figure 9.1) Geological sketch of the Stable Pit site (after Sutherland et al., 1994)

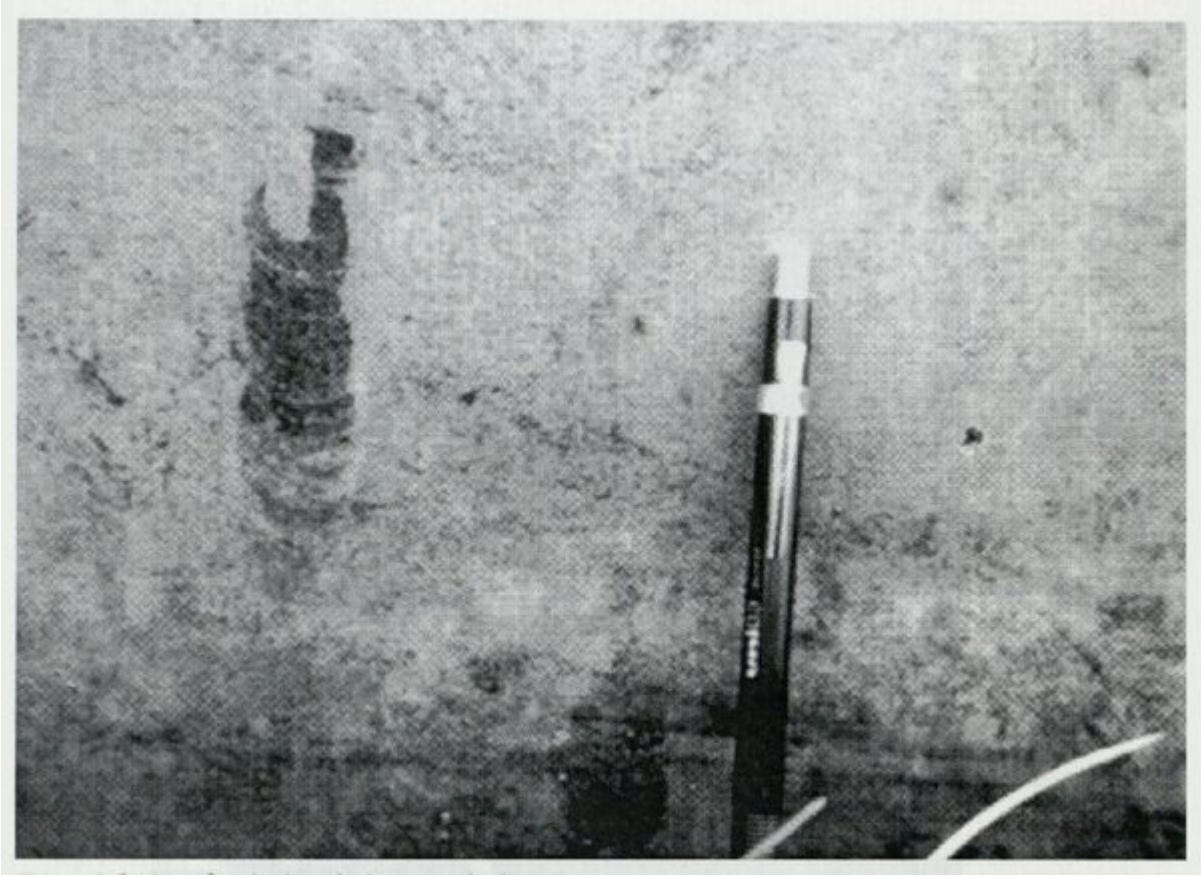
(Figure 9.2) The Stable Pit, Bradgate Park viewed north-eastwards. The prominent crags at the far side of the exposure are in quartzose sandstones of the the Stable Pit Member, Brand Hills Formation. The rocks in the foreground are part of a heterolithic, sandstone-mudstone facies. (Photo: J.N. Carney.)



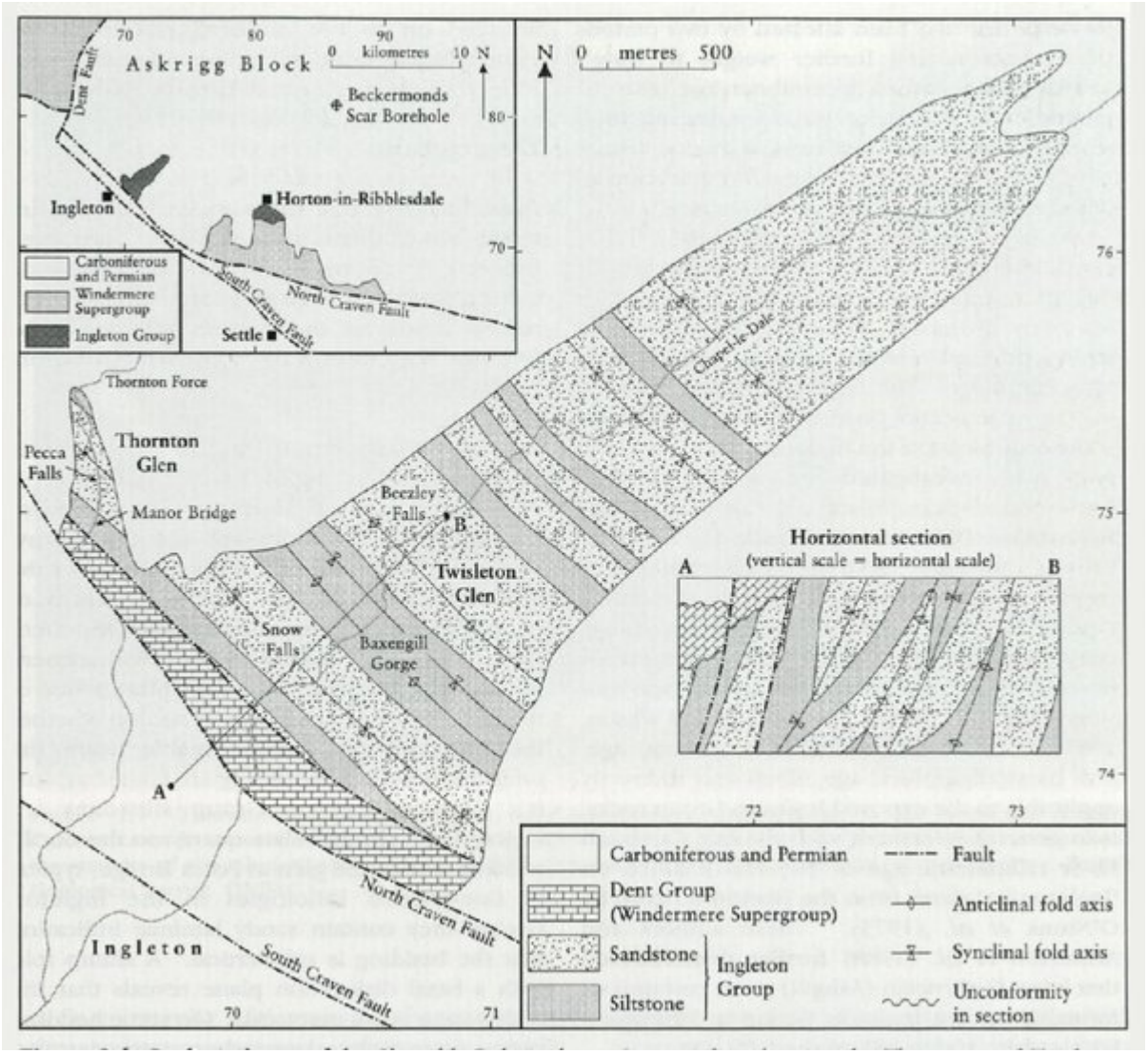
(Figure 9.3) Geological map of 'The Brand' site



(Figure 9.4) Graded sandstone of the Stable Pit Member, Brand Hills Formation, exposed at 'The Brand'. The arrows show two superimposed fining-up sedimentary cycles. Note the sediment raft 'floating' near the top of the lower graded bed. (Photo: J.N. Carney.)



(Figure 9.5) Trace fossil, identified as a Teichichnus burrow, on a gravestone at Ratby churchyard. The stone was worked from quarries in the Swithland Formation and the trace fossil is of a type that has not been found in rocks older than Lower Cambrian. (Photo: J.N. Carney.)



(Figure 9.6) Geological map of the Chapel-le-Dale Ingleton Group inlier showing the Thornton and Twisleton glens GCR site

(Figure 9.7) Thornton Force showing the sub-Carboniferous unconformity in the overhang beneath Carboniferous Limestone; weathered Ingleton Group siltstone crops out below the unconformity and around the margin of the plunge pool. (Photo: A7626, reproduced by kind permission of the Director, British Geological Survey, ©NERC.)

Grain size (mm)	SEDIMENTARY ROCKS		VOLCANICLASTIC ROCKS: Epiclastic (25-75% pyroclasts)	VOLCANICLASTIC ROCKS: Pyroclastic (>75% pyroclasts)		IGNEOUS ROCKS
256	*CONGLOMERATE* And *BRECCIA*		*VOLCANICLASTIC CONGLOMERATE, BRECCIA, GRANULESTONE* etc.	Bombs … *AGGLOMERATE* Blocks… *VOLCANIC BRECCIA*		Very coarse-grained
64						
16				*LAPILLI TUFF*		
2	*GRANULESTONE*					Coarse-grained
1-2	Very coarse-					
1-0.5	Coarse-					Medium-grained
0.25-0.5	Medium-	*SANDSTONE*	*TUFFACEOUS SANDSTONE*	Coarse	*TUFF*	
0.125-0.25	Fine-		(coarse, medium, fine etc)			
0.032-0.125	Very fine- grained					Fine-grained
0.004-0.032	*SILTSTONE*		*TUFFACEOUS SILTSTONE*	Fine		Very fine-grained
<0.004	*MUDSTONE*		*TUFFACEOUS MUDSTONE*			Cryptocrystalline

(Table 1) A simplified comparative grain-size and grain-compositional chart for sedimentary, volcaniclastic and igneous rock types. The volcaniclastic rock classification is modified from Fisher (1961) and Fisher and Schmincke (1984).