MRO 144/6/2

ACMIN WEARDALE PROJECT I

PROGRESS REPORTS FOR:

AUGUST '71
SEPTEMBER '71
OCTOBER '71
NOVEMBER '71

ACMIN WEARDALE PROJECT I

PROGRESS REPORT FOR AUGUST 1971

Mackay & Schnellmann Limited started work on 8 August in the area covered by the exploration licence granted to ACMIN Explorations (U.K.) Limited by the Weardale Lead Company Limited in the North Pennines Orefield, England.

After obtaining the additional permissions that were found to be necessary for access, geochemical stream sediment and soil sampling were begun in the area drained by the Burnhope, Evdon and Feldon Burns, on the eastern edge of the Orefield, above the village of Edmondbyers, and 82 samples had been collected by 26 August, the latest date covered by this report. This part of the licence area had been selected by Mr R.H. Jack of ACMIN Explorations N.L. for priority examination.

As this is the first report on the area, the background geology is briefly discussed below, together with geological and mining data that have been obtained since the exploration started. Future progress reports will up-date this as further such data come to hand.

A print of a 6 inches to 1 mile field map is attached, showing the locations of the streams ("burns") mentioned above, of mines and prospecting shafts in or near the area, and of samples collected up to and including 26 August. This map also will be up-dated in each progress report.

GEOLOGY

The area is underlain by the "Carboniferous Limestone Group" of Upper Carboniferous age, in arenaceous facies, with dips of only 2° to 3° between north and east.

Successions in the Ramshaw District, northwest of the area, and for the Swandale Mine in the east of the area (see map attached) provide the best available stratigraphic data for the area. A major tunnel is to be driven to conduct water from the River Tees to the Tyne Valley and will pass close to the Burnhope area.

One of four bores along the proposed route of the tunnel is about 2 miles east of the area. Cores from this have been logged in great detail by Mr D.A.C. Mills of the Institute of Geological Sciences, Leeds, and he will make the log available after clearance has been obtained from the Water Authority.

Successions for the Ramshaw District, measured from mine sections obtained from the Institute of Geological Sciences, are compared in the following table:

BED	RUTH SHAFT		EASTER SHAFT		WHITEHEAPS SHAFT	
	Thickness of bed in feet	Cumulative depth to base of bed	Thickness of bed in feet	Cumulative depth to base of bed	Thickness of bed in feet	Cumulative depth to base of bed
1st Millstone Grit	26+	26	-	-	-	-
Shale	82	108	-	-	-	-
Grindstone	38	146	-	-	-	-
Shale?	57	203	-	-	-	-
Upper Filltop Limestone	12?	215	-	-	-	-
Shale?	17	232	13+	13	-	-
Hipple Sandstone	32	264	29	42	-	-
Shale	21	285	39	81	10+	10
High Grit*	107	392	97	178	122	132
Low Grit*	102	494	87	265	120	252
Crag Limestone	4?	498	4?	269	4?	256

(*Mineralised)

BED	RUTH SHAFT Thickness of bed in feet	Cumulative depth to base of bed	EASTER SHAFT Thickness of bed in feet	Cumulative depth to base of bed	WHITEHEAPS SHAFT Thickness of bed in feet	Cumulative depth to base of bed
Firestone*	34	532	52	321	32	288
Shale? x	95	627	4+	325+	123	411
Little Limestone	9?	635	-	-	12	423
Shale? x	113	748	-	-	110	533
Great Limestone	63+	811	-	-	64+	597+

(*Mineralised x slightly mineralised)

The succession in the Swandale Shaft is as follows:

	Thickness of bed in feet	Cumulative depth to base of bed
Boulder clay	12	12
Shale	50	62
Sandstone-Grit Sill*	50	112
Shale	15	127
Sandstone-Crag Sill	24	151
Shale	18	169
Sandstone-Pattinson's Sill	29	198
Shale	12+	210

(*Mineralised; other sills mineralised elsewhere on same vein, see below)

MINERALISATION

The area was given priority by Mr Jack because the Boltsburn Vein, which continues under a variety of names for 7½ miles, trends northeast towards it, and the White Vein trends east-southeast towards it. The projected intersection of these veins, which could be the site of unusually strong mineralisation lies below the headwaters of Eudon Burn, where shafts and surface installations are shown at surface on the Ordnance Survey Old Series 6 inches to 1 mile sheet (see map attached).

The exploration method chosen by Mr Jack depends on the observed vertical continuity of veins such as the Boltsburn and White through the succession, although economic mineralisation has been developed only in certain parts of the succession. The workings in the headwaters of Eudon Burn indicate that this vertical continuity exists also in the area under examination, and other recently obtained information tends to confirm this. (The Eudon Burn workings are difficult to reach, as they drain an extensive swamp, but will be examined in due course).

Data obtained from the Institute of Geological Sciences in August show that the Swandale, Burnhope and Harehope Gill Mines were on a single vein that crosses Burnhope Burn just below the confluence of Feldon Burn and thus only just outside the area (see map attached). This vein strikes southeast, thus forming part of the same series as the White Vein, and is reported to vary in thickness between a few inches and 5 feet.

Recorded production was as follows:

Swandale

Lead ore, 1876-1887 (1878 and 1881 missing), 10 years, 266 tons.

Lead and silver, less complete records

Metallic lead in lead ore	78%
Silver per ton of lead	4.2 to 24.0 oz.

Burnhope

Lead ore, 1880-1887 (1881 missing), 7 years, 1,052½ tons

Lead and silver, less complete records

Metallic lead in lead ore	74%
Silver per ton of lead	15 oz.

Harehope Gill

Lead ore, 1852-1866 (1855-7 and 1865 missing),
11 years, 219 tons
Lead and silver, less complete records

Metallic lead in lead ore	69%
Silver per ton of lead	8 oz.

Spoil heaps at the mines include barytes, calcite, fluorspar, and much ferruginous mineral containing a little zinc blende.

Workings appear to have been confined to the Grit Sill in the Swandale Mine, but the vein was worked in all three sills in the Burnhope Mine. Workings in the Harehope Gill Mine were wholly or mainly in the Pattinson's Sill and a higher sandstone.

Levels and shafts are shown on the Ordnance Survey 6 inches to 1 mile sheets on the eastern boundary of the Pedham's Oak farmland north of Burnhope Burn, about half a mile above the confluence of Feldon Burn (see map attached); the spoil-heaps are overgrown, but some of them can still be seen and contain zinc blende, fluorspar, and galena.

Sandyford Mine is close to Burnhope Burn and within the area being explored. No written records of this mine have yet been found, though the search continues, but the spoil-heaps show that the workings were fairly extensive and in sandstones, probably entirely below the Upper Felltop Limestone, in veins containing fluorspar, galena, and zinc blende. The local view is that the mine stopped working because of increasing drainage and pumping problems and not because of exhaustion of reserves.

By contrast with the above, the workings on the Boltsburn Vein were in the Great Limestone in veins and flat replacement orebodies extending laterally into the limestone. The Great Limestone is expected to be at a depth of about 800 feet below the high ground in the south of the area being examined and 1,200 feet in the north. Developments of economic mineralisation in this below comparatively minor mineralisation, such as that at the Sandyford Mine, or below uneconomic mineralisation found by the geochemical traverses, would form deep targets, difficult to locate by drilling, in view of the known variations in dip of veins as they pass through beds of different rock types in the Orefield.

However, the mineralisation on the White Vein is in the Grit Sills (see table above) and Firestone between 216 and 363 feet above the Great Limestone. Thus economic mineralisation could occur in the area under examination not much below the level of the confluence of the Burnhope and Feldon Burns, as apparently confirmed by the reported occurrence of the Grit Sill in the Swandale Shaft nearby (always provided this can be correctly correlated with the Grit Sills of the Ramshaw District).

However, the White Vein was developed downwards into the Great Limestone, but absence of stoping suggests that no economic mineralisation was found or that it was dominantly fluorspar and unattractive at the time, and no large orebodies occur above the Great Limestone on the Boltsburn Veins.

Thus, any economic mineralisation below the area under examination is likely to be in either the Great Limestone or the Grit Sills, but unlikely to be in both. Choosing between them for the eventual drilling target may prove difficult and call for farther and more detailed study of publications on and records of the Orefield. Collection of information will therefore continue as the field work progresses.

GEOCHEMICAL SURVEY

The flat dip has produced peat-covered plateaux or "fells", with locally poor drainage, deeply dissected by streams or "burns" that flow over a series of waterfalls and rapids due either to hard grit or calcareous bands or to successive phases of stream rejuvenation.

The geochemical survey is designed to locate probably uneconomic mineralisation at surface that can be followed down by geophysics and drilling to more favourable beds.

Traverses up the ridges climb fairly steeply up the stratigraphical succession to the area of monotonous lithology comprising the fells, but any anomalies on the fells are likely to be near their sources and so to give more accurate indications of any mineralisation than traverses on the streams, although the latter provide more attenuated sections through the succession. Samples on the ridges are therefore being taken at 100-foot intervals and on the streams at 500-foot intervals.

All samples are being taken by auger. On the ridges, auger-holes are being sunk to bedrock or sub-outcrop material that cannot be penetrated, so far to 7½ feet or less. Where this produces more than one bag of sample, the lower samples will be analysed. Surface peat, mostly less than 6 inches thick but so far found to be as much as 5 feet thick is being discarded. On the streams, samples are being taken from muddy and sandy material between boulders and pebbles in the stream banks between about a foot above and a foot below water level.

The 82 samples collected so far comprise 23 from Feldon Burn (completing that traverse), 8 from Burnhope Burn, and 51 from the ridge and fell between the Feldon Smelt Mill and Black Hill (see map attached).

The samples will be sent to the laboratories of Daniel C. Griffiths & Company Limited, 39/41 Freehold Street, Hull HU3 104B, for analysis for lead and zinc. (Their terms have been approved by Mr Treves).

FUTURE PROGRAMME

Some time has been lost because of unexpected access problems, wet weather, and uncertainties about the areas for grouse-shooting on particular days, and completion of the approved geochemical survey will take another 10 to 15 days. The programme thereafter will be planned after a short interval for analysis of the samples and interpretation of the results.

ACKNOWLEDGMENTS

Mr H. Green, Manager, Weardale Lead Company Limited, has given a considerable amount of practical help in getting the programme started.

The Institute of Geological Sciences, Leeds, and Mr D.A.C. Mills in particular, have provided copies of unique records and maps, and discussed the programme in a most helpful manner. They have offered to assist in core-logging when any drilling is done, thus making available their detailed knowledge of the stratigraphy and facies variations of the region.

Mr Weeks of Wm Armstrong & Son, 35 Colinwood Buildings, Colinwood Street, Newcastle-on-Tyne, provided details of local authorities and owners of various rights over the area. Others were contacted direct, and relationships are therefore good with everyone concerned.

pp F. H. Fitch
Mackay & Schnellmann Ltd.

London
2 September 1971

ACMIN WEARDALE PROJECT II

PROGRESS REPORT FOR SEPTEMBER 1971

Mackay & Schnellmann Limited continued work in September 1971 on the area covered by the exploration licence granted to ACMIN Explorations (U.K.) Limited by the Weardale Lead Company Limited in the North Pennines Orefield, England.

Reconnaissance geochemical stream sediment and soil sampling on traverses agreed with Mr R.H. Jack of ACMIN Exploration N.L. was completed on Saturday 18 September, despite several days of bad weather and continued difficulty in hiring local help, and 295 samples were delivered to the assayers on Monday 20 September. Results were promised for the 29th or 30th, and copies will be attached to this report if possible. The up-dated working plan also attached shows the locations of the samples. The geochemical results will be added to copies of this plan and forwarded as early as possible in October with recommendations for the next exploration phase. If geochemical anomalies are sufficiently strong and distinct to indicate an early move into drilling, the application for outline planning permission for this will be completed and submitted through Macfarlanes.

Airphotographs of the area have now been received and preliminarily examined.

Local gamekeepers, farmers, landowners and other interested parties have been kept informed of the movement of personnel over the area and remain on good terms with the company's geologists.

The Sunderland and South Shields Water Authority has refused to release the log of the Tees/Tyne Aqueduct test bore, but efforts are being made to get this apparently unreasonable ruling reversed.

All possible sources of information on the Sandyford Mine have been consulted, but no written records can be found.

GEOLOGY

The old workings on Eudon Burn have now been examined, and evidence of galena, sphalerite and fluorspar mineralisation in the Grit Sills has been found, as shown on the attached working plan.

An old shaft, with evidence of mineralisation, has also been found on Burnhope Burn below Belmont Farm.

No direct evidence of veins or heavy faulting that might correspond with the White Vein has been found in the field.

Evidence of old excavations has also been found at the end of the "B" geochemical traverse at the confluence of Eudon and Burnhope Burns, but these may have been for Upper Felltop Limestone for use in the lime kilns within the area.

The Upper Felltop limestone, although shown with a continous outcrop on the 1-inch geological map, appears surprisingly lacking in carbonates and hence difficult to identify with certainty in the field. This could be due to a combination of downward transgression of the Grindstone Sill into washouts and unusual weathering converting originally siliceous limestone into a mixture of silica and limonite.

The airphotographs show a linear depression, not directly visible on the ground, crossing Eudon Burn just above the confluence of Sladeyford Sike and extending across the "A" traverse roughly at sample point A90 to Feldon Burn. This feature lines up well with the Boltsburn Vein.

The photographs show evidence of faulting in various parts of the area, also not directly visible on the ground, and also of old workings on Beautie Sike, off Burnhope Burn, although only slight traces of these were found on the ground.

F. H. Fitch,
Mackay & Schnellmann Ltd.

London
27 September 1971.

ACMIN WEARDALE PROJECT I

SUPPLEMENTARY PROGRESS REPORT, OCTOBER 1971

GEOCHEMICAL RECONNAISSANCE RESULTS

Assay results for the reconnaissance geochemical stream sediment and soil samples collected by Mackay & Schnellmann Limited from the area covered by the exploration licence granted to ACMIN Explorations (UK) Limited by the Weardale Lead Company Limited in the North Pennine Orefield, England, were forwarded to ACMIN, Sydney, early in October 1971.

2. These should now be corrected as follows:

(a) A3/No.1, Tube 3, should read A31/No.1, Tube 3.

(b) A composite of A5/No.2 and A5/No.3 gave 130 ppm lead and 100 ppm zinc.

(c) A composite of A18/No.2 and A18/No.1 gave 120 ppm lead and 90 ppm zinc.

(d) Check-assaying of A40/No.1 gave 170 ppm zinc.

(e) The missing figure for A53/no.1 is 190 ppm zinc

(f) The missing figure for X1 is 450 ppm zinc.

(g) Check-assaying of X2 gave 360 ppm zinc.

INTERPRETATION

3. Statistical analysis of the soil traverse results gave:

	Lead ppm		Zinc ppm	
	A Traverse	B Traverse	A Traverse	B Traverse
Background	160	70	100	80
Threshold	520	135	240	120

No analysis was made for the stream sediment samples as the very high results obviously due to contamination would have to be excluded and the remaining results are too few for valid analysis.

4. Graphs relating the soil sample results to background and threshold, and comparing the results for lead and zinc, accompany this report together with maps showing all the results classified into less than 100, 100 to 250, 251 to 500, and more than 500 ppm for lead and zinc separately.

5. These show that high values were obtained in the following places:

(a) Above the confluence of the Burnhope and Feldon Burns for lead and zinc, and on the A traverse nearby for lead, presumably due to contamination from the old Feldon Smeltmill.

(b) On Burnhope Burn below Sandyford Mine and presumably also due to contamination.

(c) A99 to 101, high lead and zinc, possibly indicating mineralisation on an extension of the Boltsburn Vein.

(d) A31 and 32, high lead but only background zinc, possibly indicating mineralisation.

(e) A69, high zinc but only background lead, possibly indicating mineralisation.

6. Lead values in samples A110 and 114 were slightly high, but the samples were from near grouse-shooting butts and could have been contaminated with lead shot. No explanation can be given for the slightly high values in A130 and 141, but they are not sufficiently anomalous to warrant further investigation at this stage.

RECOMMENDATIONS

7. The high values around A99 to 101, A31 and 32, and A69 warrant further investigation. However, A99 to 101 came from an area of peat bog, and the other high values, although from areas with thin peat, were for only one of the metals, unconfirmed by the other.

8. As much as 1% lead may be deposited in soil near the discharge of acid springs in England, and as much as 2% when such soils are rich in organic matter. Zinc may also be deposited from zinc-rich waters where these enter an immobilizing organic environment.

9. Lead mineralisation in the Swandale Mines, just outside the area under consideration, contained as much as 4 to 24 oz. of silver per ton, and mercury is being used more and more commonly as a pathfinder to mineralisation.

10. Assays of samples A90 to 109, A25 to 40, and A67 to 71 for silver and mercury (straddling the interesting sampling points to give indications of background metal values) are therefore recommended (a) to seek evidence that the apparent anomalies are due to mineralisation and (b) to check whether such assays should be made as a matter of routine in this area.

11. If this is successful, the following are recommended:

(a) Similar assays for the samples discussed in paragraph 6 above, to check whether they are being justifiably ignored.

(b) Additional geochemical soil sampling as follows:

(i) On a grid based on sample locations A95 to 104 and extending for 5 locations on each side of the A Traverse, at 100-foot intervals.

(ii) On a similar grid based on sample locations A27 to 36.

(iii) Fill-in sampling at 25-foot intervals between sample locations A67 and 71, to check whether the apparent anomaly at A69 is likely to be due to the outcropping of a narrow vein.

12. This additional geochemical sampling is recommended before any geophysical work because the method now appears to be suitable for this area, and observations made during the reconnaissance soil sampling showed that geophysical methods may suffer unduly from the widespread occurrence of peat and associated acid water. If the additional geochemical results are satisfactory, trenching to bedrock (now known to be generally at shallow depths in the area) might be substituted for geophysical work, or the exploration might proceed directly to drilling.

13. In view of the latter possibility, immediate application for outline planning permission for drilling and engineering works, e.g. construction of access roads and water pipe-liner, is recommended.

14. Snow, rain, gales and freezing fog become steadily more likely to interfere with work in the area from now on, and could have a serious effect or even completely prohibit work at any time between mid-November and mid-March. The grouse-shooting season is virtually over, but work may again be restricted during the grouse breeding season from March to May. An early decision on the above recommendations is therefore advisable.

F. H. Fitch
Mackay & Schnellmann Ltd

London
October 1971

ACMIN WEARDALE PROJECT I

PROGRESS REPORT, NOVEMBER 1971

The experimental silver and mercury assays on samples previously assayed for lead and zinc have been completed and indicate that mercury could be a useful pathfinder. A suggestion for further work along these lines is made below.

2. The grid geochemical soil sampling across sample locations A27 to 36 and A95 to 104 has been completed, the samples assayed for lead and zinc, and the results plotted and contoured. The anomalous indications are sufficiently clear to provide targets for shallow core-drilling to determine the sources of the anomalous values.

3. The fill-in sampling between A67 and A71 has also been completed, the samples assayed for lead, and zinc and the results plotted graphically. These indicate that the apparent anomaly at A69 may be genuine.

Silver and Mercury Assays

4. Assay results for silver and mercury for samples A25 to 40, A67 to 71, and A90 to 109 have been obtained, and copies are attached. These results have been plotted against the lead and zinc values, and the resultant graphs are also attached.

5. A25 to 40 Anomalous silver and mercury values between A30 and A32 correspond with the anomalous 6,400 ppm lead at A32, the silver being slightly more widely dispersed than the lead, and the mercury even more widely dispersed, due to its greater mobility in porous rocks and soils.

6. A67 to 71 Neither silver nor mercury is anomalous, except for the 35 ppm silver in A67, which is at present inexplicable.

7. A90 to 109 The silver values fail to peak with the lead and zinc, but anomalous mercury values correspond well with the lead and zinc peaks at A99, again showing wider dispersion.

8. <u>Conclusion</u> Geochemical assaying for silver appears not to be worth adopting as a routine procedure, but mercury appears to form a dispersion halo around high lead and/or zinc values, which could make it a useful pathfinder in any further reconnaissance sampling, and further investigation of its behaviour in the area seems justifiable.

9. The grid geochemical results described below suggest that lead and zinc assaying are reliable in themselves once an anomaly has been detected, and hence that, although mercury assaying may be useful as a reconnaissance procedure, it is not needed thereafter.

<u>Grid Sampling</u>

10. <u>Grid C</u>. Geochemical soil sampling grid C was extended on both sides of traverse A between sample points A95 and 104. The samples were assayed for lead and zinc, with the results already copied to ACMIN, Sydney, and contoured on the attached plans for each metal. These plans have been printed on transparencies to facilitate overlaying for comparison. They also show the locations of the grid samples with reference to traverse A.

11. Statistical analysis of the results, although somewhat unreliable because of the small number of samples, indicates lead threshold at 450 ppm and zinc at 250 ppm.

12. The lead and zinc anomalies centred on sample points A99 and C36 are generally coincident and confirmatory, and the contours indicate a southeasterly trend, which corresponds roughly with the trend of the White Vein.

13. The zinc anomaly centred on samples point C53 lies roughly on the Boltsburn trend from A99, but is not confirmed by the lead values.

14. The lead and zinc anomalies centred on sample point C3 are off the A99/C36 trend but, being on the edge of the grid, are as yet of unknown significance. The grid needs to be extended in this direction in due course, if drilling establishes that such anomalies in the area are indicative of mineralisation.

15. Grid D Geochemical soil sampling grid D was extended on both sides of traverse A between sample points A27 and 36. Sample locations and contoured lead and zinc assay results are shown on attached plans for each metal.

16. Statistical analysis indicated lead threshold at 500 ppm and zinc at 150 ppm.

17. The lead anomaly at A32 was traced southwest to D66, where a new zinc anomaly was found, but the contouring indicated no distinct trend.

18. New lead anomalies were found centred on D8, D10, and D50, unconfirmed by zinc, but all these are on the edges of the grid and are as yet of unknown significance. D100 is possibly anomalous, but the same comment applies.

19. Conclusions. The lead and zinc anomalies at A99, C36, D66 are sufficiently strong and well-defined to provide targets for shallow core-drilling to determine the sources of the anomalous values. The zinc anomaly at C53 provides a subsidiary target. If this drilling showed the anomalies to be due to significant mineralisation, the grids should be extended to check on the new anomalies at C3, D8, D10, and D50.

Fill-in Sampling

20. Samples E1 to 12 were taken at 25 foot intervals to fill in between A67 and 71. The relationships between the samples and the previous and new assay results are shown on the attached graph, together with the silver and mercury results discussed above.

21. This graph shows a new anomaly of 4,800 ppm lead at E5, between samples A68 and 69, confirmed by high zinc. Together with the previous anomalous zinc result at A69, this suggests the possible presence of a narrow zone of mineralisation that should be further investigated in due course. This could be most conclusively done by drilling if a machine is brought into the area for the purposes considered in paragraph 19 above.

Recommendations

22. The next step should be core-drilling to between 100 and 200 feet at up to ten localities at and/or near sample points A99, C76, C53, D66 and A69/5E. A drilling contractor will be asked whether this can be done during the coming winter months.

23. This should precede any further geochemical soil sampling but, if it shows the anomalies to be due to significant mineralisation the grids should at least be extended in due course to check on the new anomalies at C3, D8, D10 and D50, and a new grid should be sampled around the A69/5L anomaly.

24. The proposal in paragraph 11 (b) (i) of the Supplementary Progress Report, October 1971, to assay for silver and mercury in samples A110 to 114 and A130 to 141 should be shelved for the time-being, as neither metal has shown itself reliable as a means of checking on doubtful anomalies.

25. However, consideration should be given to assaying for mercury in all the samples from grids C and D to supplement the indications of the behaviour of this metal given by the assays for samples A25 to 40 and A90 to 109, and hence to check on its value as a reconnaissance pathfinder. Although this work could be done during the expected close-down of field work in the forthcoming winter months, which may delay the recommended drilling, the timing for it is a matter for decision by ACMIN, who may prefer to postpone it until the vital question of the possible significance of the already discovered anomalies has been determined, and no action will be taken pending receipt of their instructions.

F.H. Fitch
Mackay & Schnellmann Ltd.

London
December 1971

Date: 24/11/71 REPORTING STATE:

Unit: ppb = (1×10⁹)

OUR REF 4500/4C

	YOUR Lab. Ref:	Hg		YOUR REF	Hg
11	F3	210	A90	F92	72
25	F28	58	A91	F93	138
26	F29	106	A92	F94	148
27	F30	102	A93	F95	176
28	F31	66	A94	F96	184
29	F32	58	A95	F97	170
30	F33	174	A96	F98	200
32	F34	58	A97	F99	370
33	F35	30	A98	F100	300
34	F36	20	A99	F101	330
35	F37	28	A100	F102	290
36	F38	48	A101	F103	176
37	F39	20	A102	F104	152
38	F40	50	A103	F105	158
39	F41	44	A104	F106	186
40	F42	80	A105	F107	86
67	F69	72	A106	F108	144
68	F70	64	A107	F109	114
69	F71	50	A108	F110	116
70	F72	34	A109	F111	92
71	F73	42			

REMARKS:

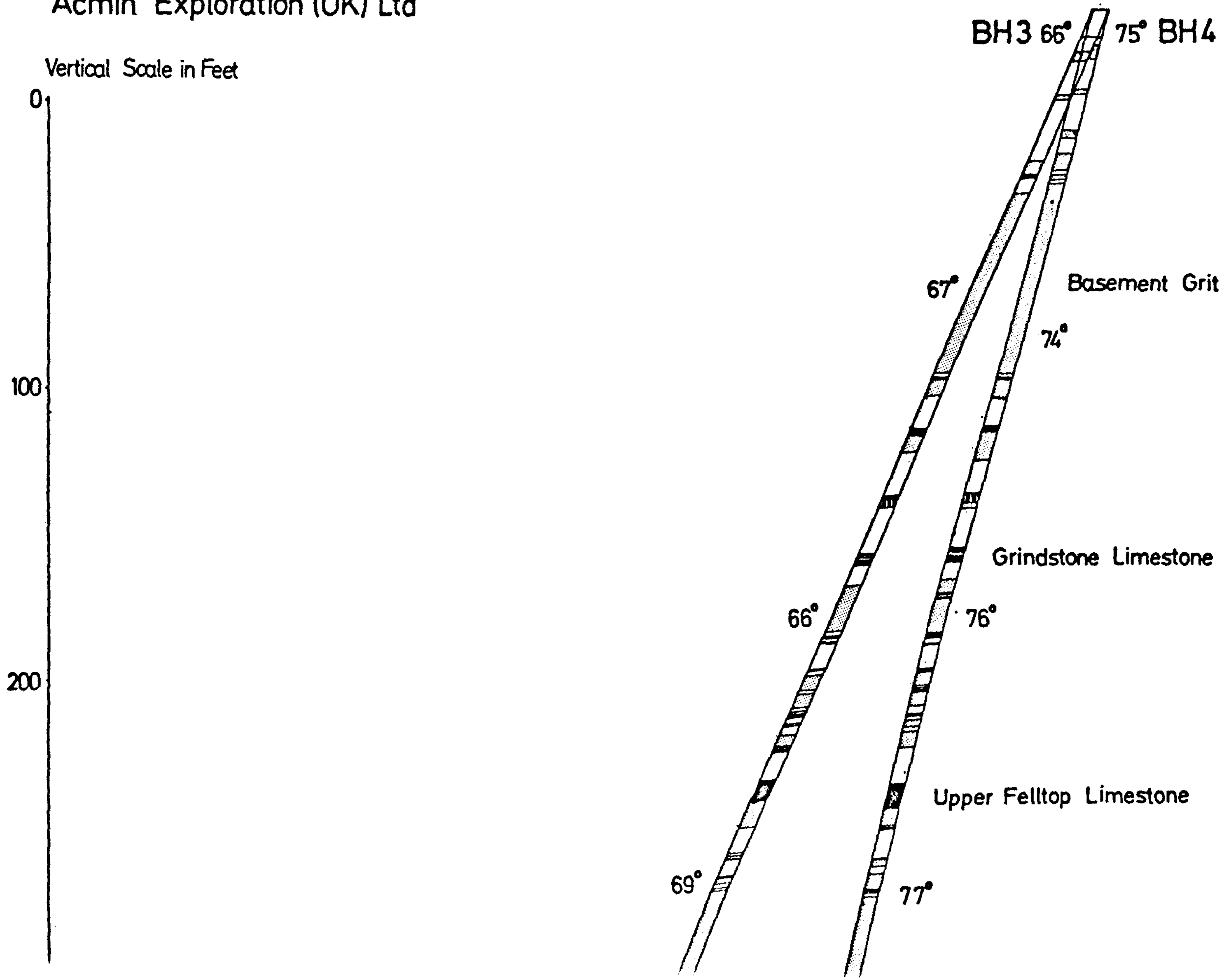
LAB176/5T671Q

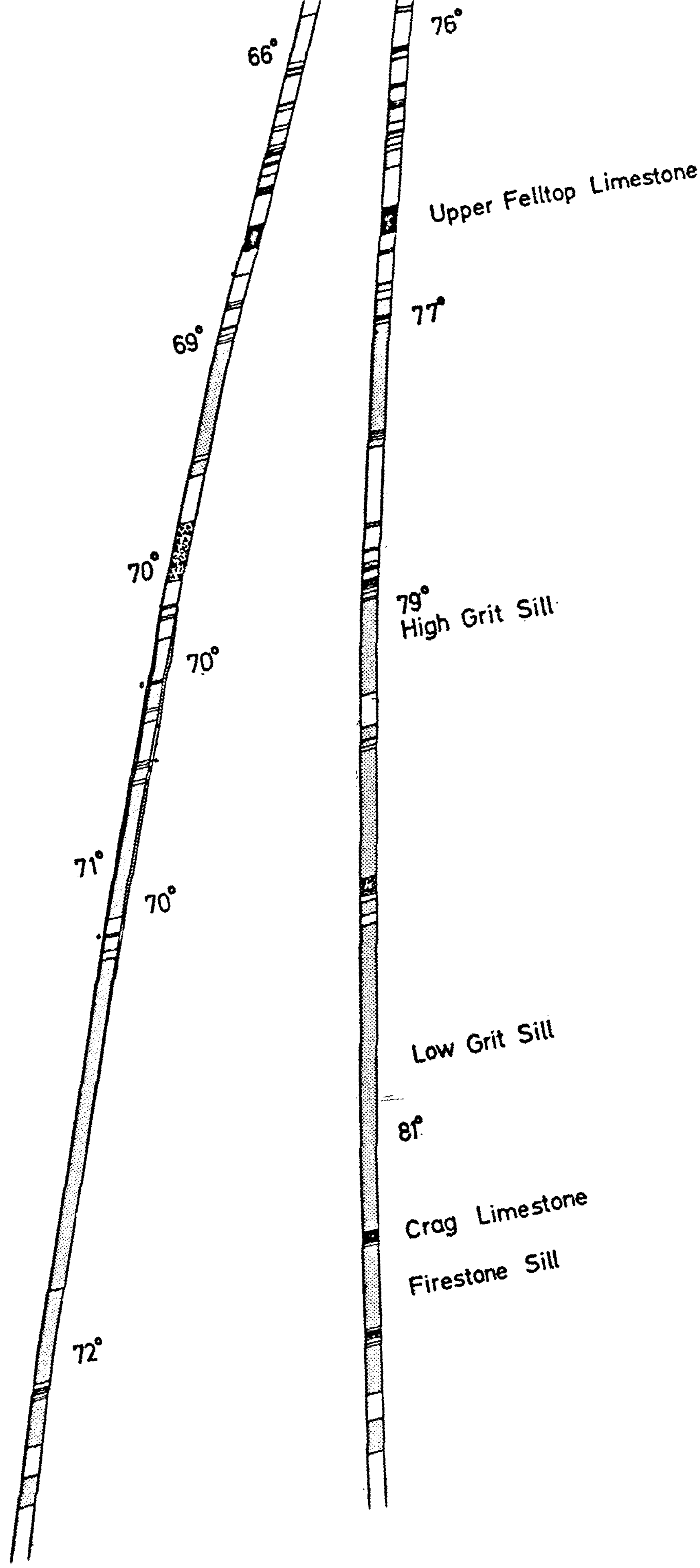
~~SAMPLE~~ Tube NO	~~TUBE~~ Sample NO	T%	Δ	Sple weight	Dilution ml.	Further Dilution	p.p.m.			
3	A31	96	·0177	2g	100	NONE	16			
29	A25	98	·0088	"	"	"	8			
1	A26	99	·0044	"	"	"	4			
30	A27	98	·0088	"	"	"	8			
31	A28	99	·0044	"	"	"	4			
32	A29	99	·0044	"	"	"	4			
33	A30	99	·0044	"	"	"	4			
34	A32	96.5	·0155	"	"	"	14			
35	A33	98.5	·0066	"	"	"	6			
36	A34	99	·0044	"	"	"	4			
37	A35	98.5	·0066	"	"	"	6			
38	A36	99	·0044	"	"	"	4			
39	A37	98.5	·0066	"	"	"	6			
40	A38	99	·0044	"	"	"	4			
41	A39	99	·0044	"	"	"	4			
42	A40	98.5	·0066	"	"	"	6			
0.8g 69	A67	96.5	·0155	.08g	"	"	35			
70	A68	99	·0044	2g	"	"	4			
71	A69	99	·0044	"	"	"	4			
72	A70	98	·0088	"	"	"	8			
73	A71	98.5	·0066	"	"	"	6			
92	A90	98.5	·0066	"	"	"	6			
93	A91	97.5	·0110	"	"	"	11			
94	A92	98.5	·0066	"	"	"	6			
95	A93	98	·0088	"	"	"	8			
96	A94	97.5	·0110	"	"	"	11			
97	A95	98.5	·0066	"	"	"	6			
98	A96	99	·0044	"	"	"	4			
99	A97	99	·0044	"	"	"	4			
100	A98	98.5	·0066	"	"	"	6			
101	A99	98.5	·0066	"	"	"	6			
102	A100	98.5	·0066	"	"	"	6			
103	A101	98.5	·0066	"	"	"	6			
104	A102	9.8.5	·0066	"	"	"	6			
105	A103	99	·0044	"	"	"	4			
106	A104	98.5	·0066	"	"	"	6			
107	A105	99	·0044	"	"	"	4			
108	A106	99	·0044	"	"	"	4			
109	A107	99	·0044	"	"	"	4			
110	A108	99	·0044	"	"	"	4			
111	A109	99	·0044	"	"	"	4			

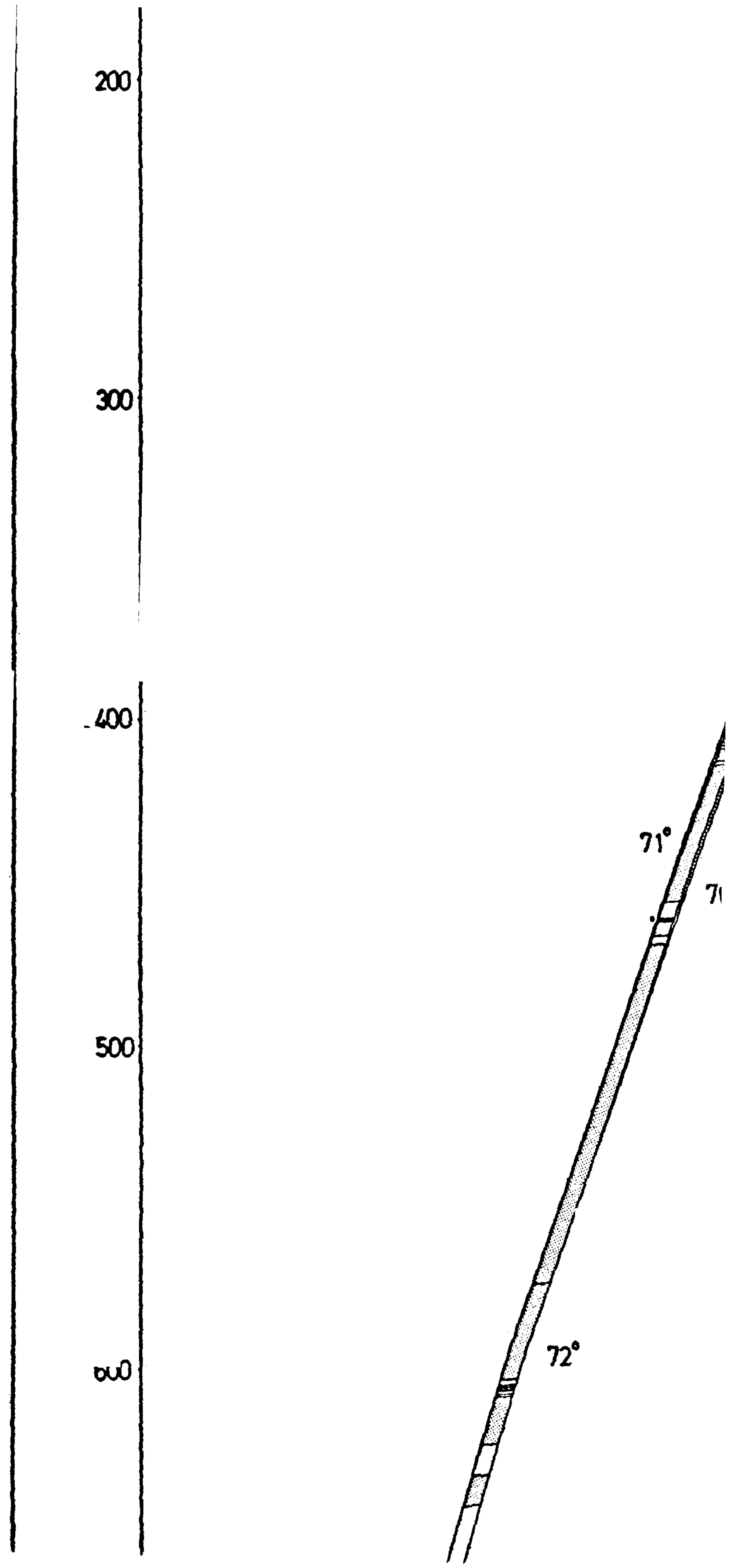
Fig. 3

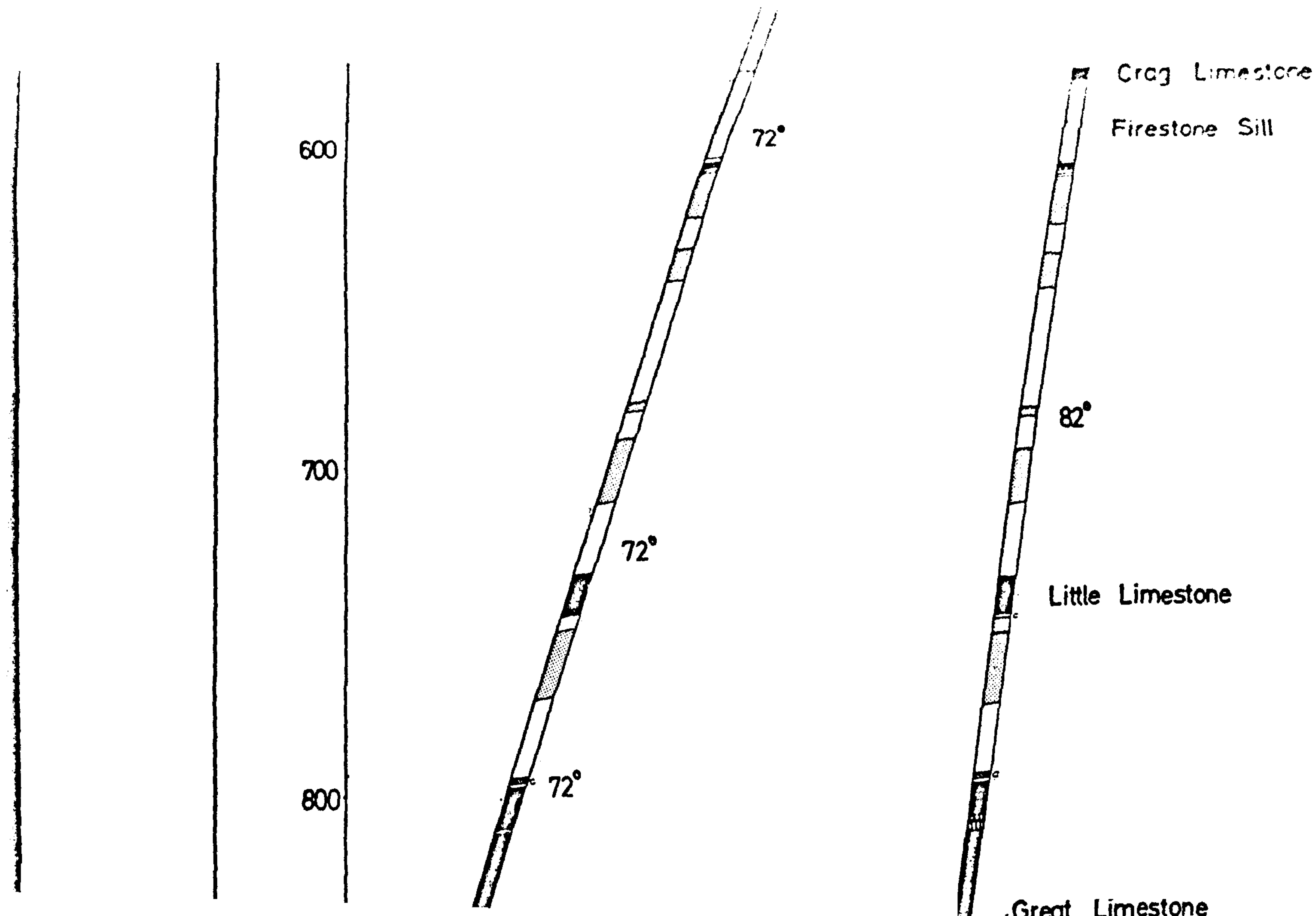
Simplified Graphic Log of Boreholes BH3, BH4

Acmin Exploration (UK) Ltd

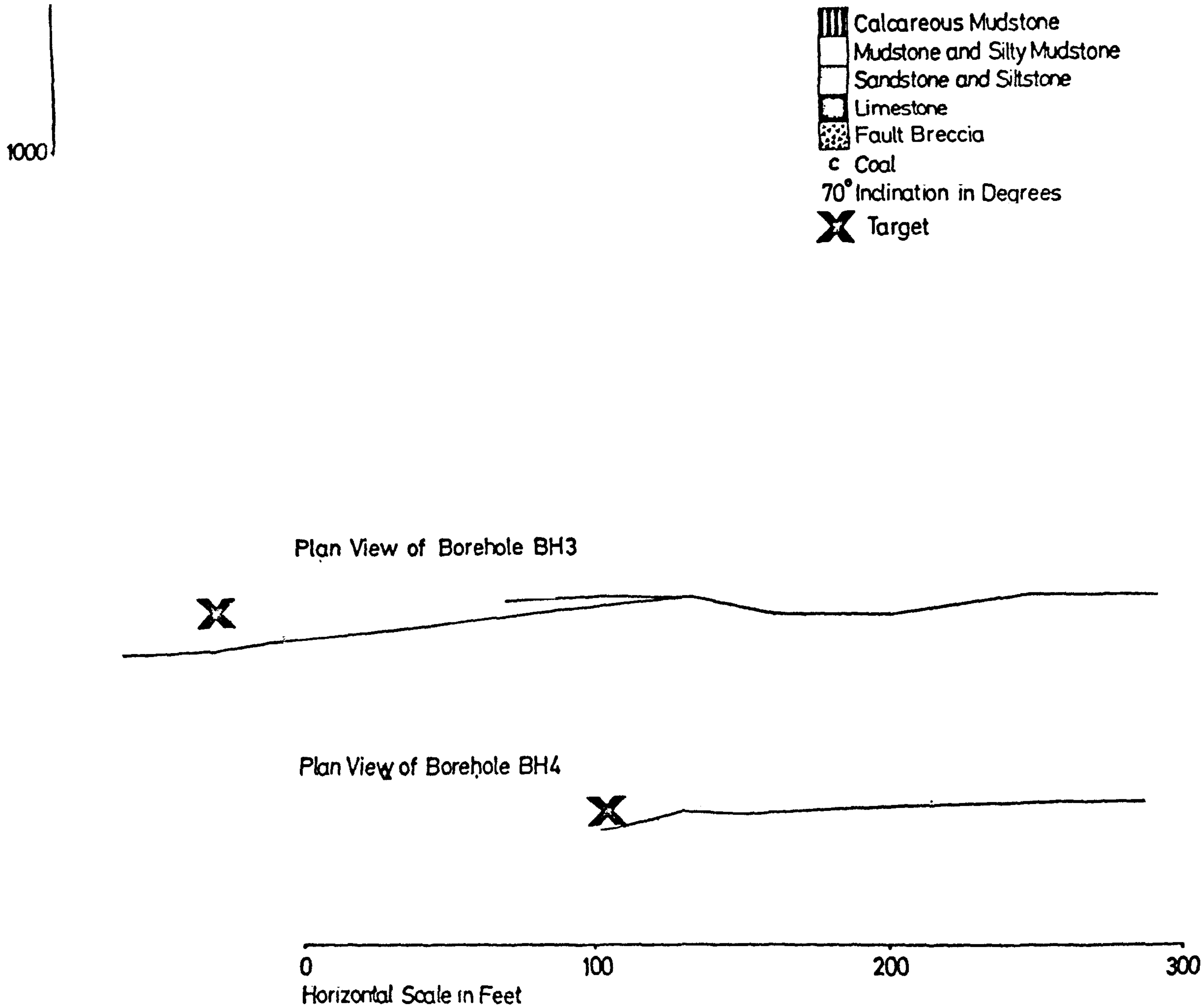



66°
76°
Upper Felltop Limestone
77°
69°
70°
79°
High Grit Sill
70°
71°
70°
Low Grit Sill
81°
Crag Limestone
Firestone Sill
72°


200
300
400
500
600
71°
72°



Crag Limestone
Firestone Sill
600
72°
700
72°
82°
Little Limestone
800
72°
Great Limestone



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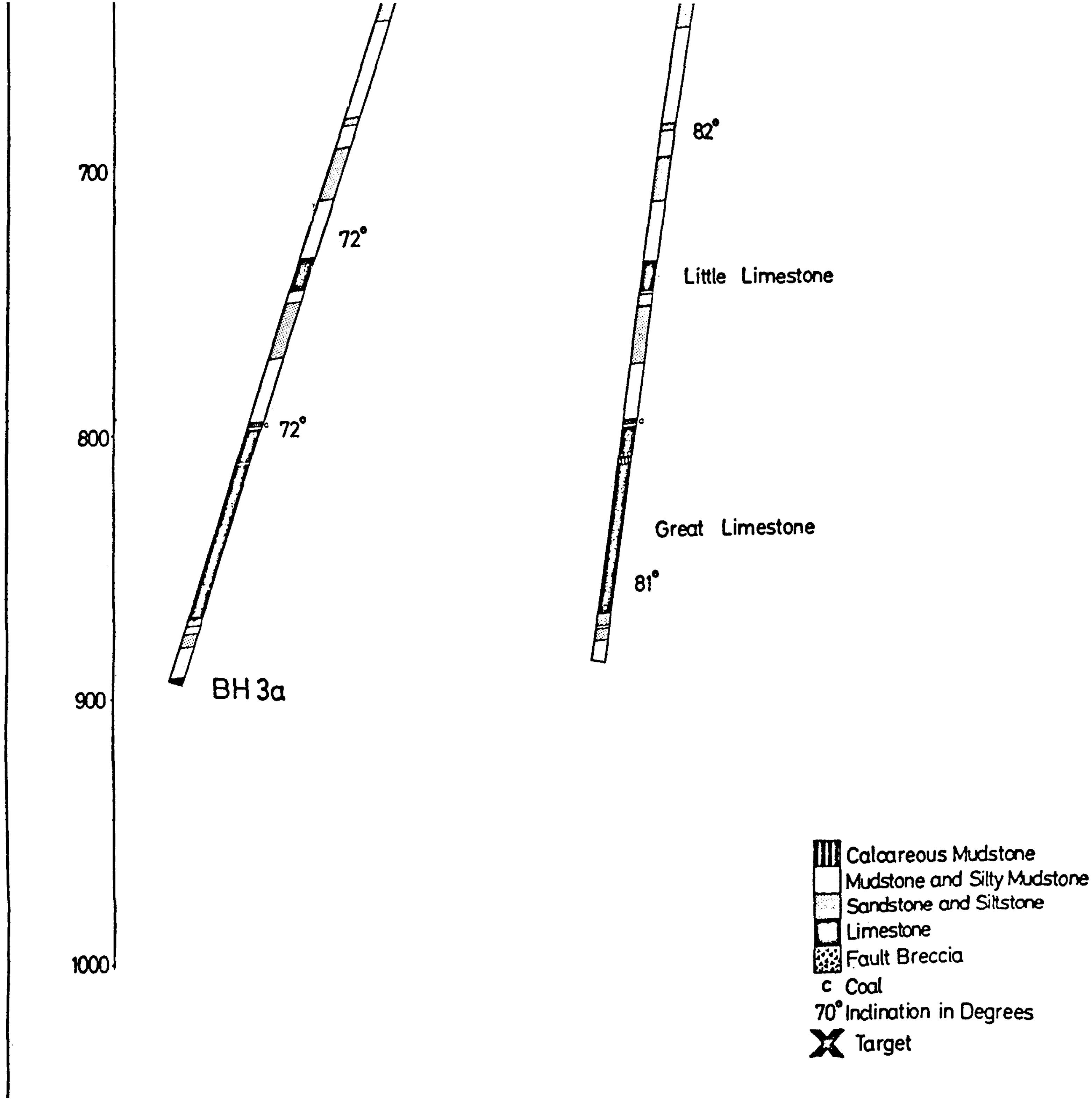
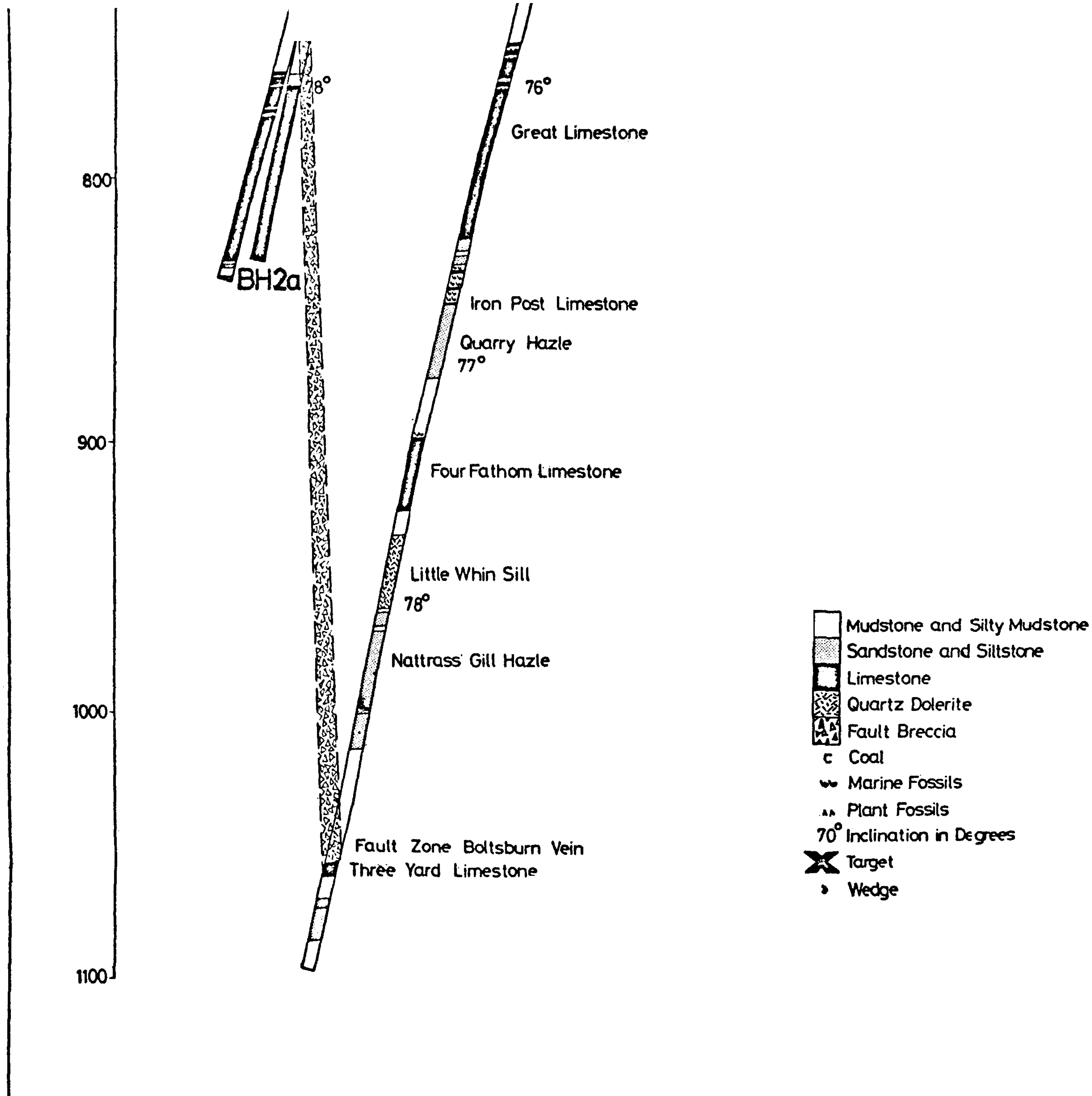
May 1973

Fig. 3.



700
800
900
1000
72°
72°
BH 3a
82°
Little Limestone
Great Limestone
81°
Calcareous Mudstone
Mudstone and Silty Mudstone
Sandstone and Siltstone
Limestone
Fault Breccia
c Coal
70° Inclination in Degrees
Target



800
900
1000
1100
BH2a
78°
76°
Great Limestone
Iron Post Limestone
Quarry Hazle
77°
Four Fathom Limestone
Little Whin Sill
78°
Nattrass Gill Hazle
Fault Zone Boltsburn Vein
Three Yard Limestone
Mudstone and Silty Mudstone
Sandstone and Siltstone
Limestone
Quartz Dolerite
Fault Breccia
c Coal
Marine Fossils
Plant Fossils
70° Inclination in Degrees
Target
Wedge

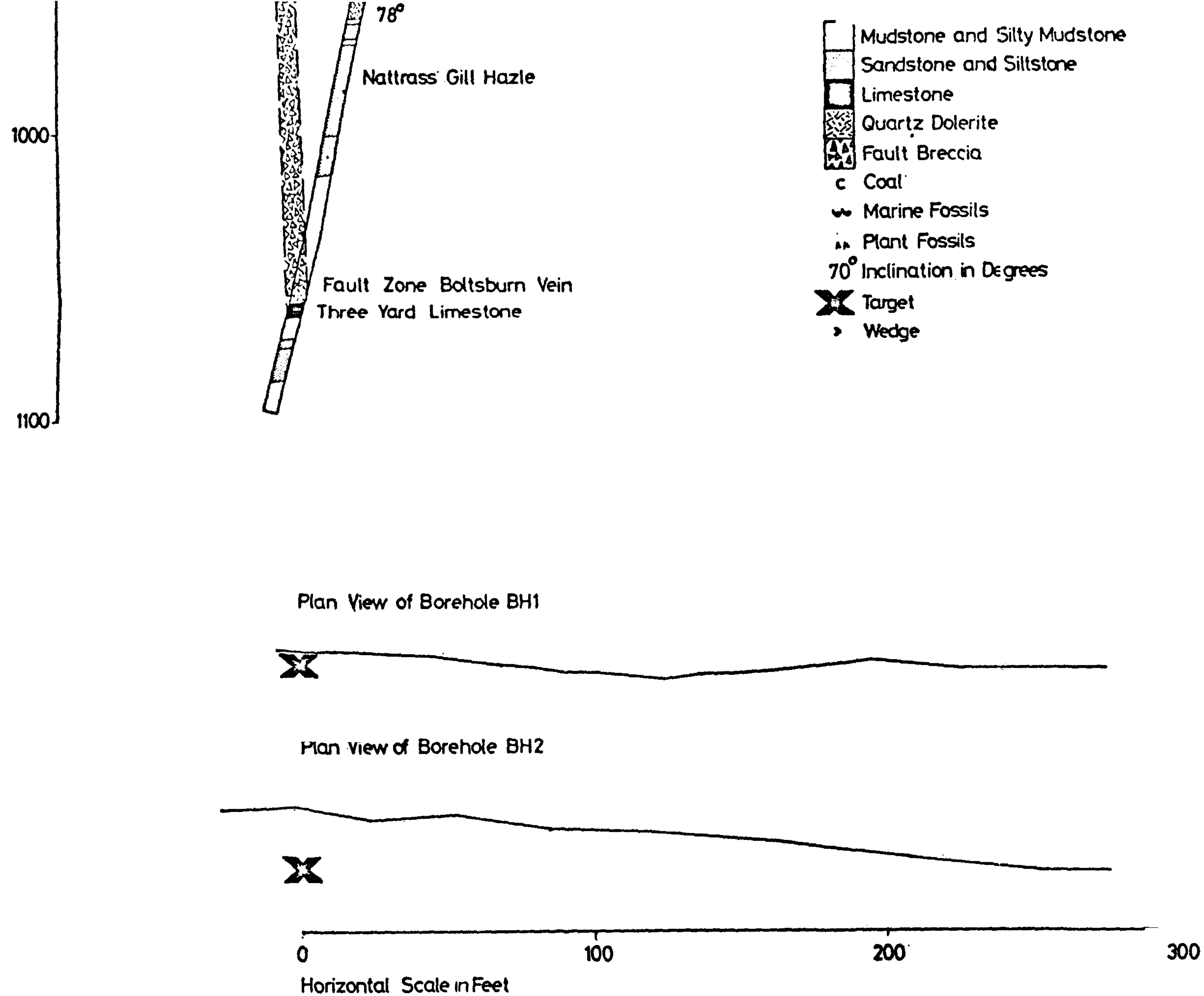


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Fig. 1.

Simplified Graphic Log of Boreholes BH1, BH2, BH3

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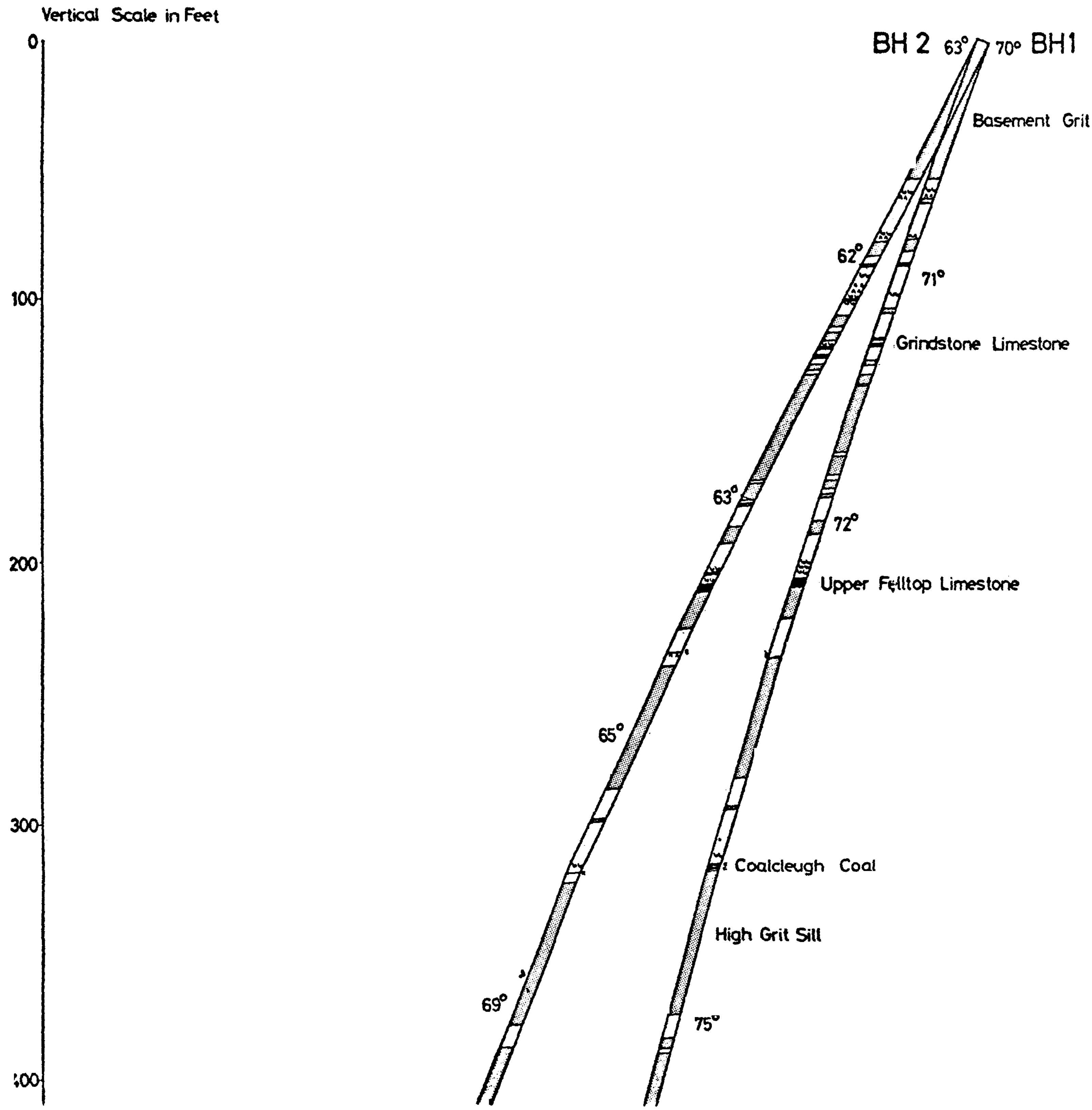
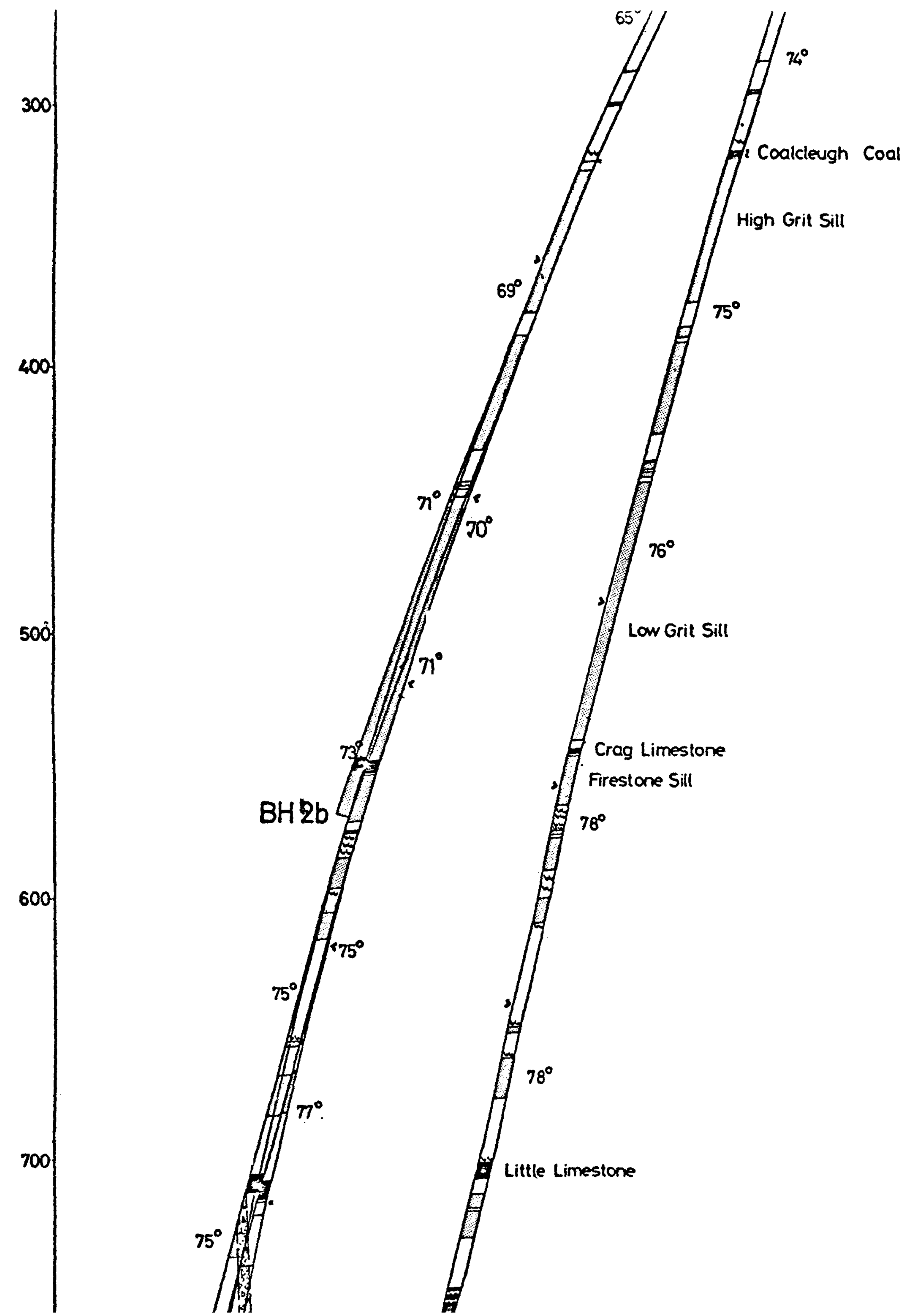




300
400
500
600
700
65°
74°
Coalcleugh Coal
High Grit Sill
69°
75°
71°
70°
76°
Low Grit Sill
71°
73°
Crag Limestone
Firestone Sill
BH 2b
78°
75°
75°
78°
77°
Little Limestone
75°

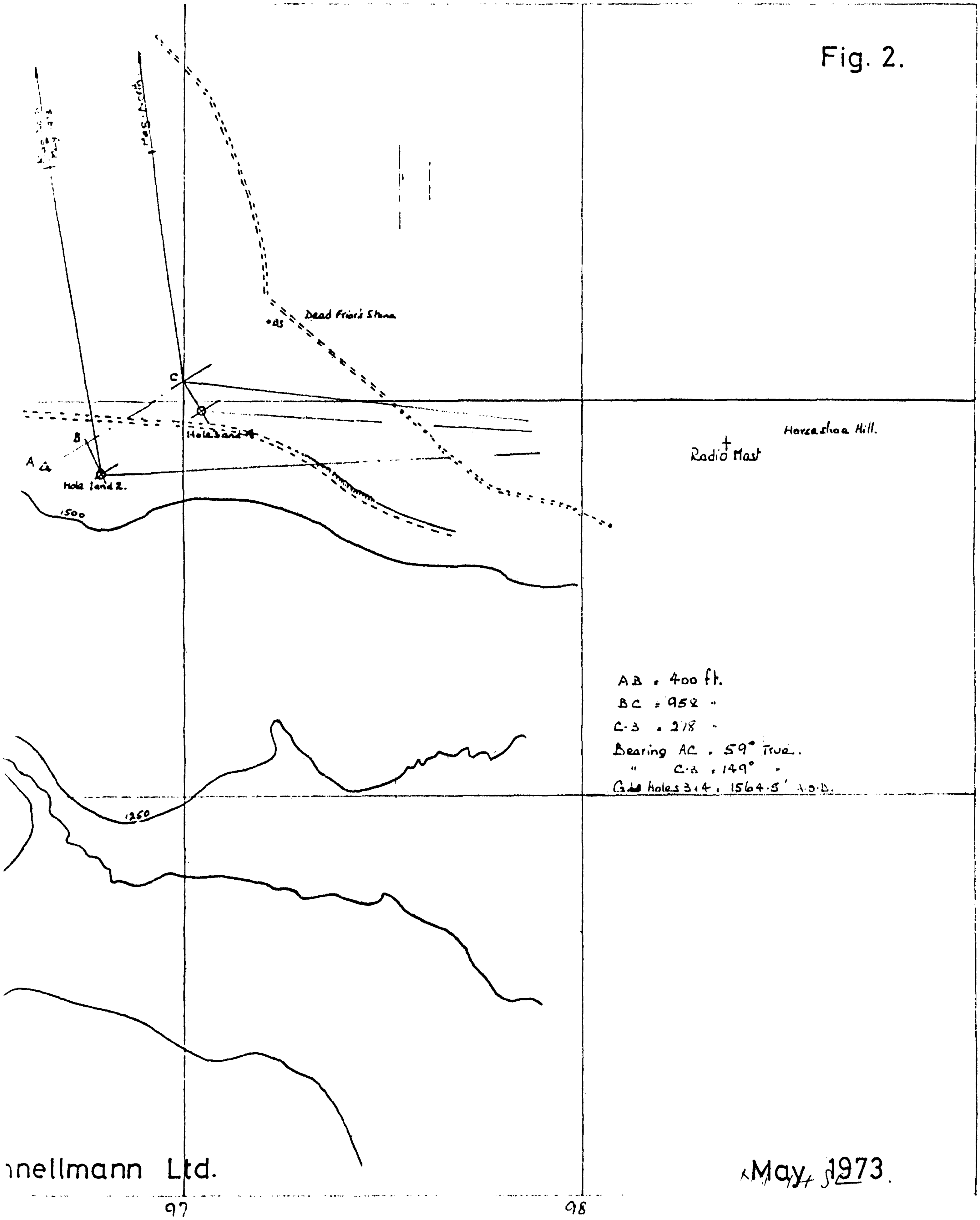
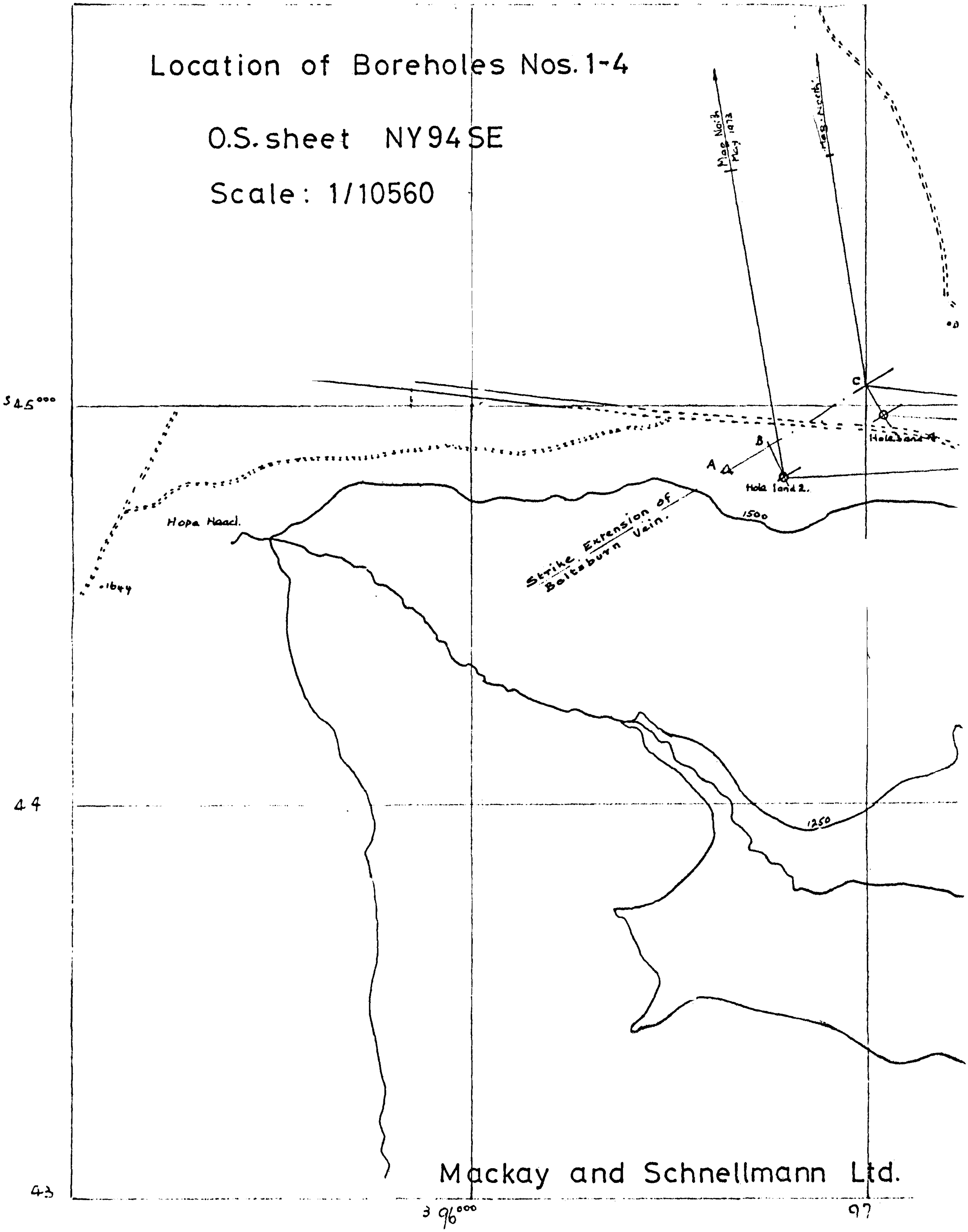

Dead Friar's Stone
C
B
A
Hole 1 and 2.
1500
1250
Horsehoe Hill.
Radio Mast
AB = 400 ft.
BC = 958 "
C-3 = 278 "
Bearing AC = 59° True.
" C-3 = 149° "
nellmann Ltd.
May 1973.
97
98

Fig. 2.



Location of Boreholes Nos. 1-4
O.S. sheet NY94SE
Scale: 1/10560
Mag. North May 1973
Mag. North
C
B
A
Hole 1 and 2.
Hole 3 and 4
1500
Hope Head.
·1644
Strike Extension of Boltsburn Vein.
1250
345000
44
43
396000
97
Mackay and Schnellmann Ltd.