TOWARDS A PROCESS-RESPONSE MODEL FOR CLIFFED COASTS:

THE CASE OF NORTH-EAST YORKSHIRE

by

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VOLUME 3

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The data presented in this volume have been formally presented as part of this Ph.D. thesis because, being measurements of erosion or form at specific points in time, they can never be repeated. Therefore it was felt that they should be made available for the use of other research workers with the proviso that they remain under the strict control of the writer. The innumerable measurements of form made on the cliffs, shore platform, coastline, and superficial deposits, as well as measurements of the rate of erosion of the coastline can be repeated by other workers in the field or laboratory (albeit only after a considerable expenditure of energy) and so are not presented here.

Appendix III consists of the data collected at the Hawsker Bottoms cliff in 1971 and 1972. The reader will find the nature of the data more intelligible if he has first read Chapter 3 of the thesis.

Appendix IV lists all the M.E.M. measurements made at various sites between Robin Hood's Bay and Port Mulgrave during 1970, 1971 and 1972. The parts of the thesis which are primarily concerned with this data are Chapters 4, 5 and 6.

Appendix V is composed of all the worksheets (in reduced form) used to record cliff morphology. The method of construction of the sheets and the measurement techniques employed to gather the data are described in Chapter 2.

APPENDIX III

DATA COLLECTED AT HAWSKER BOTTOMS

Introduction

Appendix III lists first the data concerned primarily with the marine-activated cliff. The locations of the four sites at which debris was collected and weighed are shown in Fig. 3.1 of the thesis.

The second part of this appendix consists of the measurements of erosion made on erosion pins inserted in the bevel. The general locations of these erosion pin sites are also shown in Fig. 3.1.

The third section of the appendix tabulates the distances between pairs of screws emplaced in the sandstone scarp in order to measure the rates of opening of joints. The technique to be followed in making these readings is described in Chapter 3.

The fourth part shows measurements made on every block of rock greater than 25cm long which fell from the sandstone scarp in 1971 and 1972. The crosses referred to in this table are painted on the rock; the locations of a few are shown in Fig. 3.1. These blocks have pink spots on them. Blocks deemed to be in transit across the bevel have blue spots and those now lying on talus cones have yellow spots. The areas of blue and yellow rocks are shown in Fig. 3.10.

In the final section of this appendix is shown the size of the overhang of the sandstone scarp at the paint crosses.

Key:

- indicates that no reading was taken

Site 1

From Time	From Date	To Time	To Date	Weight Shale (gm)	Weight Sandstone (gm)
1800	26.4.71	1000	28.4.71	545	-
1000	28.4.71	1530	28.4.71	255	-
2000	4.5.71	1345	5.5.71	188	-
1345	5.5.71	1345	6.5.71	68	-
1345	6.5.71	1045	7.5.71	266	-
1045	7.5.71	1400	18.5.71	2915	-
1400	18.5.71	1430	19.5.71	15790	-
1430	19.5.71	1400	20.5.71	290	-
1400	20.5.71	1045	21.5.71	130	-
1515	24.5.71	1400	25.5.71	150	-
1400	25.5.71	1015	26.5.71	95	-
1015	26.5.71	1915	26.5.71	10	-
1915	26.5.71	1030	27.5.71	160	-
1030	27.5.71	1700	27.5.71	40	-
1700	27.5.71	0945	28.5.71	70	-
0945	28.5.71	2030	1.6.71	450	-
2030	1.6.71	1330	2.6.71	20	-
1330	2.6.71	1500	3.6.71	205	-
1500	3.6.71	1115	4.6.71	210	-
1115	4.6.71	1815	7.6.71	3380	-
1815	7.6.71	2200	8.6.71	1540	-
2200	8.6.71	1600	9.6.71	150	-
1600	9.6.71	1045	10.6.71	70	-
1045	10.6.71	1830	10.6.71	130	-
1830	10.6.71	1900	14.6.71	2650	-
1900	14.6.71	1145	15.6.71	1100	-
1145	15.6.71	1215	16.6.71	500	-
1215	16.6.71	1145	17.6.71	3570	0
1145	17.6.71	1100	18.6.71	800	0
1100	18.6.71	1800	21.6.71	1725	0
1800	21.6.71	1630	22.6.71	620	0
1630	22.6.71	1715	23.6.71	235	0
1715	23.6.71	1830	28.6.71	2860	0
1830	28.6.71	1900	29.6.71	1370	1.9
1900	29.6.71	1200	1.7.71	395	0
1200	1.7.71	0915	2.7.71	85	0
0915	2.7.71	1845	5.7.71	5015	0
1845	5.7.71	1500	6.7.71	20	0
1500	6.7.71	1715	7.7.71	505	0.8
1715	7.7.71	1515	8.7.71	225	0
1515	8.7.71	1015	9.7.71	410	0
1015	9.7.71	1830	12.7.71	22305	0
1830	12.7.71	1800	13.7.71	45	0
1800	13.7.71	1800	14.7.71	250	0
1800	14.7.71	2100	15.7.71	23825	6.8
1245	16.7.71	1600	19.7.71	2690	0
1600	19.7.71	1545	20.7.71	10	0
1545	20.7.71	0900	21.7.71	25	0
0900	21.7.71	1500	3.8.71	6360	0
1500	3.8.71	1645	4.8.71	2555	0
1645	4.8.71	1700	5.8.71	265	0

(continued)

Site 1 (continued)

From Time	From Date	To Time	To Date	Weight Shale (gm)	Weight Sandstone (gm)
1700	5.8.71	1245	6.8.71	185	0
2000	11.8.71	1230	12.8.71	20	0
1230	12.8.71	1115	13.8.71	55	0
1115	13.8.71	1715	16.8.71	355	0
1715	16.8.71	1430	17.8.71	165	0
1430	17.8.71	1445	18.8.71	185	0
1445	18.8.71	1900	2.9.71	29070	1.6
1900	2.9.71	1500	3.9.71	85	0
1500	3.9.71	1700	6.9.71	1880	0
1700	6.9.71	1800	7.9.71	520	0
1800	7.9.71	1800	8.9.71	1370	6.2
1800	8.9.71	1730	9.9.71	110	0
1730	9.9.71	0945	10.9.71	35	0
0945	10.9.71	1630	13.9.71	245	0
1630	13.9.71	1045	14.9.71	85	0
1045	14.9.71	1500	15.9.71	190	0
1500	15.9.71	1545	16.9.71	10	0
1545	16.9.71	1215	17.9.71	60	0
1215	17.9.71	1545	20.9.71	2750	0
1545	20.9.71	1545	21.9.71	245	0
1545	21.9.71	1745	22.9.71	30	0
1745	22.9.71	1530	23.9.71	80	0
1730	6.10.71	1800	7.10.71	1100	0
1800	7.10.71	0945	8.10.71	55	0.7
0945	8.10.71	1445	13.10.71	7055	3.5
1445	13.10.71	1515	14.10.71	10100	0
1515	14.10.71	1345	15.10.71	430	0
1345	15.10.71	1500	19.10.71	1955	0
1500	19.10.71	1515	20.10.71	7900	0
1745	25.10.71	1630	26.10.71	25	0
1630	26.10.71	1530	27.10.71	250	0
1530 BST	27.10.71	1600 GMT	1.11.71	3685	0
1600	1.11.71	1545	2.11.71	1350	0
1445	15.11.71	1200	16.11.71	1970	0.7
1515	30.11.71	1330	1.12.71	20	0
1045	8.12.71	1130	9.12.71	270	0
1130	9.12.71	1145	10.12.71	1700	0
1145	10.12.71	1415	20.12.71	2150	0.3
1415	20.12.71	1330	21.12.71	2150	0
1630	4.1.72	1015	5.1.72	420	0
1015	5.1.72	1045	6.1.72	15	0
1045	6.1.72	1100	7.1.72	5	0
1100	7.1.72	1445	10.1.72	2100	0
1445	10.1.72	1630	11.1.72	8120	0
1630	11.1.72	1100	13.1.72	1800	0

Site 2

From Time	From Date	To Time	To Date	Weight Shale (gm)	Weight Sandstone (gm)
1800	26.4.71	1000	28.4.71	5418	-
1000	28.4.71	1530	28.4.71	1306	-
2015	4.5.71	1400	5.5.71	11886	-
1400	5.5.71	1400	6.5.71	5689	-
1400	6.5.71	1100	7.5.71	4497	-
1100	7.5.71	1530	18.5.71	157675	-
1530	18.5.71	1500	19.5.71	4900	-
1500	19.5.71	1415	20.5.71	1130	-
1415	20.5.71	1100	21.5.71	1635	-
1100	21.5.71	1630	24.5.71	125340	-
1630	24.5.71	1415	25.5.71	3170	-
1915	25.5.71	1030	26.5.71	2060	-
1030	26.5.71	1330	26.5.71	1760	-
1330	26.5.71	1615	26.5.71	6700	-
1615	26.5.71	1915	26.5.71	365	-
1915	26.5.71	1015	27.5.71	3760	-
1015	27.5.71	1715	27.5.71	2740	-
1715	27.5.71	0945	28.5.71	1950	-
0945	28.5.71	2130	1.6.71	46000	-
2130	1.6.71	1345	2.6.71	1970	-
1345	2.6.71	1445	3.6.71	3090	-
1445	3.6.71	1130	4.6.71	840	-
1130	4.6.71	1830	7.6.71	11890	-
1830	7.6.71	2215	8.6.71	3970	-
2215	8.6.71	1800	9.6.71	36020	-
1800	9.6.71	1030	10.6.71	16700	-
1030	10.6.71	1845	10.6.71	1550	-
1845	10.6.71	2000	14.6.71	51690	-
2000	14.6.71	1200	15.6.71	2130	-
1200	15.6.71	1245	16.6.71	13920	-
1245	16.6.71	1245	17.6.71	7235	70.0
1245	17.6.71	1400	18.6.71	30990	-
1400	18.6.71	1900	21.6.71	26855	-
1900	21.6.71	1730	22.6.71	17140	90.0
1730	22.6.71	1800	23.6.71	11860	27.7
1800	23.6.71	2000	28.6.71	37660	76.4
2000	28.6.71	1945	29.6.71	18140	151.5
1945	29.6.71	1330	1.7.71	26860	133.5
1330	1.7.71	1000	2.7.71	4010	35.5
1000	2.7.71	2215	5.7.71	304135	184.9
2215	5.7.71	1530	6.7.71	2275	14.8
1530	6.7.71	1800	7.7.71	20560	29.0
1800	7.7.71	1600	8.7.71	9680	53.7
1600	8.7.71	1115	9.7.71	2185	35.9
1115	9.7.71	1930	12.7.71	13885	109.0
1930	12.7.71	1830	13.7.71	1820	50.0
1830	13.7.71	1900	14.7.71	3265	89.2
1215	16.7.71	1715	19.7.71	25410	119.3
1715	19.7.71	1615	20.7.71	1715	42.6
1615	20.7.71	1000	21.7.71	940	47.3

(continued)

Site 2 (continued)

From Time	From Date	To Time	To Date	Weight Shale (gm)	Weight Sandstone (gm)
1000	21.7.71	1645	3.8.71	138225	257.1
1645	3.8.71	1730	4.8.71	65920	151.9
1730	4.8.71	1715	5.8.71	9490	31.5
1715	5.8.71	1315	6.8.71	9125	22.6
2030	11.8.71	1245	12.8.71	1640	3.3
1245	12.8.71	1130	13.8.71	1240	9.8
1130	13.8.71	1745	16.8.71	4925	496.4
1745	16.8.71	1445	17.8.71	2875	25.6
1445	17.8.71	1515	18.8.71	2805	23.4
1515	18.8.71	1830	2.9.71	76150	725.4
1830	2.9.71	1515	3.9.71	2770	6.1
1515	3.9.71	1730	6.9.71	11600	83.9
1730	6.9.71	1815	7.9.71	4320	21.9
1815	7.9.71	1815	8.9.71	15685	17.4
1815	8.9.71	1745	9.9.71	3095	8.9
1745	9.9.71	0945	10.9.71	550	8.5
0945	10.9.71	1645	13.9.71	18120	46.1
1645	13.9.71	1100	14.9.71	1745	19.9
1100	14.9.71	1515	15.9.71	7700	2.9
1515	15.9.71	1600	16.9.71	500	4.2
1600	16.9.71	1230	17.9.71	1080	17.5
1230	17.9.71	1615	20.9.71	6875	319.1
1615	20.9.71	1600	21.9.71	1925	13.4
1600	21.9.71	1800	22.9.71	500	19.3
1800	22.9.71	1545	23.9.71	2075	14.6
1545	23.9.71	1600	4.10.71	41675	102.9
1600	4.10.71	1715	5.10.71	2585	17.9
1715	5.10.71	1800	6.10.71	16770	35.2
1800	6.10.71	1815	7.10.71	1850	40.1
1815	7.10.71	1000	8.10.71	485	14.7
1000	8.10.71	1500	13.10.71	11970	98.2
1500	13.10.71	1530	14.10.71	790	16.8
1530	14.10.71	1400	15.10.71	1970	5.3
1400	15.10.71	1515	19.10.71	14210	38.6
1515	19.10.71	1530	20.10.71	1955	26.4
1745	25.10.71	1645	26.10.71	650	1.9
1645	26.10.71	1545	27.10.71	2210	4.5
1545 BST	27.10.71	1615 GMT	1.11.71	6125	103.9
1615	1.11.71	1600	2.11.71	1650	13.4
1500	15.11.71	1215	16.11.71	3920	9.3
1515	30.11.71	1345	1.12.71	85	16.0
1345	1.12.71	1100	8.12.71	5730	143.3
1100	8.12.71	1145	9.12.71	770	2.4
1145	9.12.71	1200	10.12.71	1860	12.1
1200	10.12.71	1500	20.12.71	27875	237.5
1500	20.12.71	1345	21.12.71	4780	10.1
1345	21.12.71	1630	4.1.72	75000	361.8
1630	4.1.72	1030	5.1.72	4100	18.1
1030	5.1.72	1045	6.1.72	2410	9.8
1045	6.1.72	1100	7.1.72	125	2.5
1100	7.1.72	1500	10.1.72	8075	45.6
1500	10.1.72	1615	11.1.72	2500	26.6
1615	11.1.72	1100	13.1.72	13700	34.3

Site 3

From		To		Weight Shale (gm)	Weight Sandstone (gm)
Time	Date	Time	Date		
1800	26.4.71	1030	28.4.71	9429	-
1030	28.4.71	1545	28.4.71	2898	-
2045	4.5.71	1430	5.5.71	4966	-
1430	5.5.71	1430	6.5.71	9032	-
1430	6.5.71	1115	7.5.71	10244	-
1115	7.5.71	1645	18.5.71	119325	-
1645	18.5.71	1515	19.5.71	4030	-
1515	19.5.71	1430	20.5.71	3800	-
1430	20.5.71	1130	21.5.71	8150	-
1130	21.5.71	2030	24.5.71	49450	-
2030	24.5.71	1445	25.5.71	5110	-
1915	25.5.71	1045	26.5.71	1570	-
1045	26.5.71	1345	26.5.71	235	-
1345	26.5.71	1630	26.5.71	750	-
1630	26.5.71	1930	26.5.71	750	-
1930	26.5.71	1000	27.5.71	1420	-
1000	27.5.71	1730	27.5.71	5650	-
1730	27.5.71	0915	28.5.71	6220	-
0915	28.5.71	2230	1.6.71	41790	-
2230	1.6.71	1400	2.6.71	3020	-
1400	2.6.71	1400	3.6.71	2490	-
1400	3.6.71	1145	4.6.71	1470	-
1145	4.6.71	1900	7.6.71	11990	-
1900	7.6.71	2230	8.6.71	3150	-
2230	8.6.71	1630	9.6.71	2310	-
1630	9.6.71	1000	10.6.71	1360	-
1000	10.6.71	1900	10.6.71	1200	-
1900	10.6.71	2115	14.6.71	17350	-
2115	14.6.71	1215	15.6.71	2450	-
1215	15.6.71	1300	16.6.71	9950	-
1300	16.6.71	1330	17.6.71	5930	-
1330	17.6.71	1230	18.6.71	17260	-
1230	18.6.71	1945	21.6.71	16450	-
1945	21.6.71	1830	22.6.71	7805	-
1830	22.6.71	1930	23.6.71	7950	2.2
1930	23.6.71	2145	28.6.71	47815	0.3
2145	28.6.71	2015	29.6.71	17075	25.1
2015	29.6.71	1430	1.7.71	10765	0
1430	1.7.71	1045	2.7.71	5810	0
1045	2.7.71	1700	6.7.71	57585	32.8
1700	6.7.71	1845	7.7.71	10560	47.0
1845	7.7.71	1730	8.7.71	10755	6.2
1730	8.7.71	1230	9.7.71	4170	8.8
1230	9.7.71	2100	12.7.71	33095	605.0
2100	12.7.71	1915	13.7.71	5560	8.9
1915	13.7.71	2000	14.7.71	6760	0.6
2000	14.7.71	1200	16.7.71	58160	-
1200	16.7.71	1815	19.7.71	17905	49.1
1815	19.7.71	1700	20.7.71	7060	0.4
1700	20.7.71	1030	21.7.71	1045	0
1030	21.7.71	1800	3.8.71	62105	245.1
1800	3.8.71	1745	4.8.71	5105	72.8
1745	4.8.71	1745	5.8.71	3250	0.6
1745	5.8.71	1345	6.8.71	8375	59.7

Site 3 (continued)

From Time	From Date	To Time	To Date	Weight Shale (gm)	Weight Sandstone (gm)
2115	11.8.71	1245	12.8.71	415	0
1245	12.8.71	1130	13.8.71	990	2.1
1130	13.8.71	1800	16.8.71	1810	0
1800	16.8.71	1515	17.8.71	2725	6.1
1515	17.8.71	1515	18.8.71	7230	0.9
1515	18.8.71	1715	2.9.71	136490	58650.8
1715	2.9.71	1530	3.9.71	1590	1.2
1530	3.9.71	1745	6.9.71	28075	2.7
1745	6.9.71	1830	7.9.71	9650	50.9
1830	7.9.71	1830	8.9.71	26480	10.6
1830	8.9.71	1800	9.9.71	5605	23.6
1800	9.9.71	1000	10.9.71	1585	0
1000	10.9.71	1715	13.9.71	44270	8.5
1715	13.9.71	1115	14.9.71	1960	0
1115	14.9.71	1530	15.9.71	2550	1.0
1530	15.9.71	1600	16.9.71	1010	0
1600	16.9.71	1245	17.9.71	2470	0
1245	17.9.71	1700	20.9.71	16660	14.0
1700	20.9.71	1615	21.9.71	3790	1.7
1615	21.9.71	1815	22.9.71	3635	31.3
1815	22.9.71	1615	23.9.71	3130	1.0
1615	23.9.71	1630	4.10.71	52110	12.0
1630	4.10.71	1730	5.10.71	6590	0
1730	5.10.71	1815	6.10.71	20000	20.3
1815	6.10.71	1830	7.10.71	3140	2.6
1830	7.10.71	1015	8.10.71	1320	5.4
1015	8.10.71	1530	13.10.71	8915	231.5
1530	13.10.71	1545	14.10.71	2820	4.1
1545	14.10.71	1415	15.10.71	1220	0.5
1415	15.10.71	1545	19.10.71	15490	8.1
1545	19.10.71	1545	20.10.71	1475	0
1545	20.10.71	1800	25.10.71	12820	23.9
1800	25.10.71	1700	26.10.71	3985	1.7
1700	26.10.71	1600	27.10.71	4440	10.2
1600 BST	27.10.71	1645 GMT	1.11.71	25130	0
1645	1.11.71	1615	2.11.71	3485	10.7
1615	2.11.71	1515	3.11.71	815	0
1515	15.11.71	1230	16.11.71	7560	74.0
1500	30.11.71	1400	1.12.71	370	0
1400	1.12.71	1115	8.12.71	6400	3.1
1115	8.12.71	1200	9.12.71	2460	4.0
1200	9.12.71	1215	10.12.71	5165	0
1215	10.12.71	1545	20.12.71	29850	2593.5
1545	20.12.71	1400	21.12.71	4400	11.8
1400	21.12.71	1615	4.1.72	18800	0
1615	4.1.72	1115	5.1.72	4770	0
1115	5.1.72	1100	6.1.72	2900	0
1100	6.1.72	1115	7.1.72	150	0
1115	7.1.72	1515	10.1.72	19090	8.3
1515	10.1.72	1600	11.1.72	13400	0
1600	11.1.72	1115	13.1.72	3875	23.3

Site 4

From Time	From Date	To Time	To Date	Weight Shale (gm)	Weight Sandstone (gm)
1530	19.5.71	1500	20.5.71	270	-
1500	20.5.71	1145	21.5.71	480	-
1145	21.5.71	1730	24.5.71	1100	-
1730	24.5.71	1500	25.5.71	60	-
1500	25.5.71	1100	26.5.71	100	-
1100	26.5.71	1930	26.5.71	0	-
1930	26.5.71	1000	27.5.71	45	-
1000	27.5.71	1745	27.5.71	20	-
1745	27.5.71	0900	28.5.71	10	-
0900	28.5.71	1430	2.6.71	870	-
1430	2.6.71	1915	7.6.71	990	-
1915	7.6.71	2200	14.6.71	2900	-
2200	14.6.71	2000	21.6.71	2410	-
2000	21.6.71	2215	28.6.71	3590	82.2
2215	28.6.71	1730	6.7.71	8230	86.3
1730	6.7.71	2115	12.7.71	2390	411.3
2115	12.7.71	1845	19.7.71	10185	107.0
1845	19.7.71	1830	3.8.71	15890	150.9
1830	3.8.71	1830	10.8.71	3505	82.6
1830	10.8.71	1815	16.8.71	4340	33.2
1815	16.8.71	1600	3.9.71	10120	120.8
1600	3.9.71	1815	6.9.71	1480	44.5
1815	6.9.71	1730	13.9.71	1120	137.3
1730	13.9.71	1715	20.9.71	1280	37.5
1715	20.9.71	1645	4.10.71	3630	33.3
1645	4.10.71	1600	13.10.71	14000	36.8
1600	13.10.71	1615	19.10.71	2770	-
1615	19.10.71	1815	25.10.71	5810	27.0
1815 BST	25.10.71	1700 GMT	1.11.71	1040	1.0
1545	30.11.71	1130	8.12.71	415	2.7
1130	8.12.71	1600	20.12.71	2375	10.1
1600	20.12.71	1130	5.1.72	4870	25.9
1130	5.1.72	1530	10.1.72	235	13.0

Appendix III.2

Erosion Pin Data

Key to nature of surface:

b	unvegetated shale in situ
a	shale fragments covering in situ rock
ab	loose shale fragments but in situ rock visible
g	surface vegetated

Erosion Pin Site 1

Data invalid.

Erosion Pin Site 2

Location: down the ridge shown in Fig. 3.1 ; pins about one metre apart, numbered down ridge.

Pin No.	Initial nature of surface	26.5.71 upper side (mm)	26.5.71 lower side (mm)	20.10.71 upper side (mm)	20.10.71 lower side (mm)	21.4.72 upper side (mm)	21.4.72 lower side (mm)	20.7.72 upper side (mm)	20.7.72 lower side (mm)
1	g	69	74	76	69	69	74	-	-
2	g	128	132	119	127	112	116	-	-
3	g	101	99	100	100	100	100	101	100
4	g	108	106	102	109	107	107	106	110
5	b	27	19	26	25	38	49	37	50
6	b	83	86	69	71	76	78	80	80
7	a	64	64	64	76	60	66	49	66
8	a	52	51	52	51	51	50	46	50
9	a	72	72	73	73	70	72	73	77
10	ab	61	61	53	55	54	56	59	62
11	ab	34	34	27	37	40	42	39	45
12	ab	38	38	37	38	36	37	37	40
13	ab	50	51	50	54	49	51	48	50
14	ab	48	45	40	40	40	41	39	41
15	b	29	32	24	31	24	27	29	32
16	ab	38	39	39	41	40	42	43	48
17	ab	43	42	35	40	33	38	39	42
18	b	28	27	27	24	27	27	26	28
19	b	51	51	40	49	44	48	50	50
20	b	31	36	31	35	33	38	35	39
21	ab	56	55	52	54	50	52	52	52
22	ab	56	55	52	55	54	54	51	55
23	ab	51	51	50	52	45	52	51	52
24	a	72	75	73	75	58	73	60	66
25	ab	37	38	30	37	30	32	28	31
26	ab	45	47	44	47	40	42	40	42
27	a	116	115	111	112	-	-	-	-
28	a	173	174	172	176	153	169	162	167
29	a	62	61	61	61	56	60	60	65
30	a	60	60	59	59	55	58	56	58
31	a	85	84	76	72	72	71	66	68
32	ab	62	60	61	60	57	58	56	58
33	ab	62	61	53	59	60	59	52	54
34	ab	36	38	28	37	29	39	25	36
35	ab	52	52	51	52	48	52	51	50
36	ab	54	54	42	48	48	51	39	39
37	a	78	74	68	69	61	63	52	57
38	ab	66	66	57	61	53	60	29	70
39	ab	120	126	107	126	112	122	98	122
40	ab	98	97	91	91	89	95	90	94
41	ab	40	37	33	37	34	37	39	38
42	ab	44	44	40	42	37	40	37	40
43	ab	39	41	38	40	36	39	39	40
44	ab	41	37	35	37	35	35	35	35
45	ab	51	54	55	55	54	59	45	52
46	ab	36	39	-2*	21	30	33	37	42
47	b	34	41	52	71	12	46	13	61
48	ab	166	173	162	191	173	178	194	189
49	ab	165	165	155	166	142	150	144	164
50	a	70	74	44	87	83	102	104	108

* surface above top of erosion pin

Erosion Pin Site 3

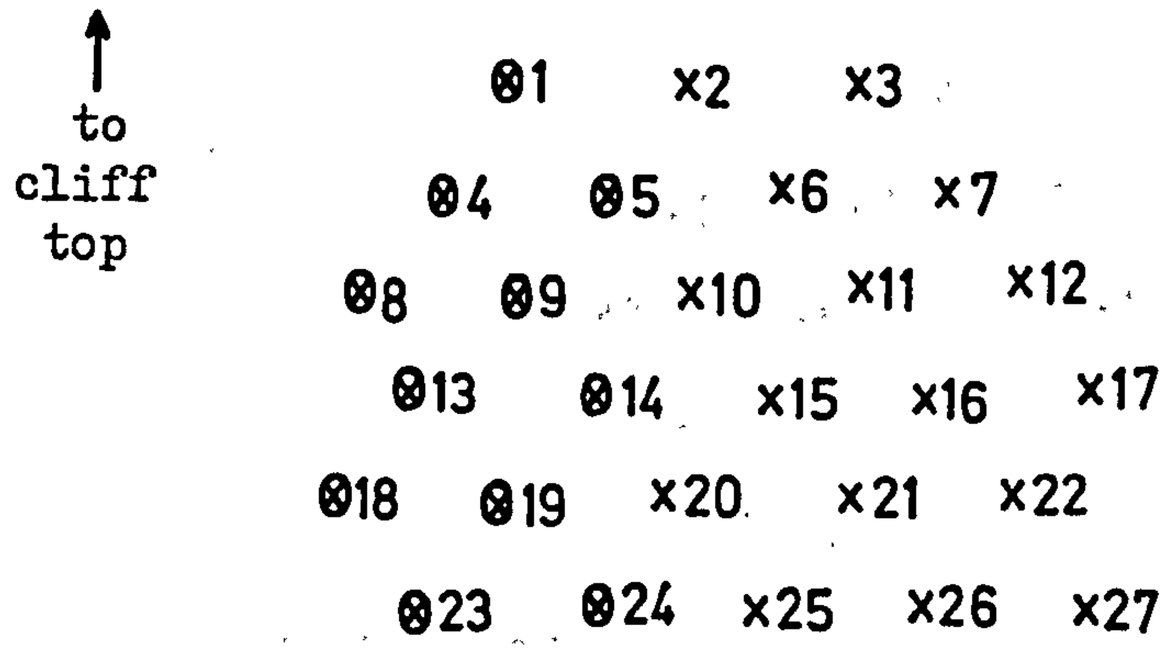
Location: about four metres west of site 2; pins numbered downslope.

Pin No.	Initial nature of surface	25.5.71 upper side (mm)	25.5.71 lower side (mm)	14.10.71 upper side (mm)	14.10.71 lower side (mm)	20.4.72 upper side (mm)	20.4.72 lower side (mm)	20.7.72 upper side (mm)	20.7.72 lower side (mm)
1	g	75	81	-	-	79	84	-	-
2	g	-	-	133	130	131	131	-	-
3	g	65	68	69	69	67	66	72	72
4	g	72	75	81	80	77	80	79	80
5	g	83	84	82	83	86	83	84	87
6	g	31	36	38	36	35	39	41	42
7	g	48	48	47	46	37	40	40	42
8	b	34	31	41	23	41	30	43	38
9	a	24	29	30	34	32	34	32	35
10	g	47	48	33	50	39	44	32	48
11	g	47	47	-	-	-	-	51	48
12	g	133	133	139	142	140	136	*179	177
13	g	-	-	162	160	-	-	-	-
14	g	34	36	37	39	35	36	29	35
15	g	71	71	72	73	70	71	90	90
16	g	92	93	95	95	103	101	104	102
17	g	50	49	54	54	53	53	55	55
18	g	42	44	51	51	53	53	54	54
19	a	144	145	145	144	154	159	153	157
20	a	49	53	50	51	-	-	-	-
21	a	64	63	50	58	41	44	42	43
22	g	58	60	66	70	60	62	62	65
23	g	78	79	82	82	64	71	67	70
24	g	62	62	66	67	-	-	85	83
25	g	55	58	64	70	66	67	68	70
26	g	70	69	64	69	67	69	71	72
27	a	68	71	71	75	50	50	50	51
28	g	61	63	64	65	68	72	76	76
29	g	68	72	77	72	76	69	76	76
30	a	91	94	88	92	79	85	80	86
31	a	67	67	53	56	43	48	46	48
32	g	43	46	42	45	42	45	41	44
33	g	80	85	82	86	82	86	80	84
34	a	44	45	38	35	-	-	63	63
35	a	40	45	26	36	26	37	30	42
36	a	48	46	45	46	45	46	44	43

* new erosion pin installed - readings of 20.4.72 and 20.7.72 cannot be compared

Erosion Pin Site 4

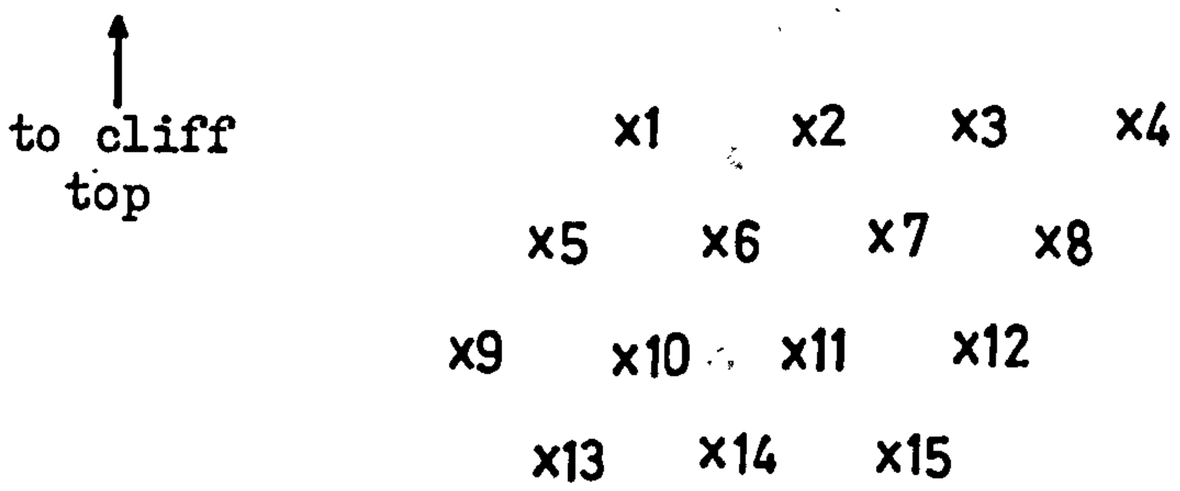
Location: a few metres to the west of site 3 (see Fig. 3.1); erosion pins are arranged in a mosaic as follows:



Pin No.	Initial nature of surface	25.5.71 upper side (mm)	25.5.71 lower side (mm)	15.10.71 upper side (mm)	15.10.71 lower side (mm)	20.4.72 upper side (mm)	20.4.72 lower side (mm)	20.7.72 upper side (mm)	20.7.72 lower side (mm)
1	a	116	110	102	104	112	114	110	112
2	a	112	114	103	106	108	108	95	107
3	a	110	111	95	107	103	107	103	107
4	a	119	120	116	118	113	119	112	115
5	a	99	96	93	95	93	95	95	99
6	a	94	96	93	93	86	91	86	91
7	a	111	112	100	100	106	109	96	109
8	a	127	128	123	126	125	126	128	130
9	a	108	109	103	106	115	115	112	118
10	a	144	143	142	143	142	144	140	145
11	a	126	127	123	123	120	121	120	124
12	a	191	192	168	167	180	185	181	184
13	a	-	-	86	85	82	83	80	85
14	a	135	136	138	140	141	140	140	141
15	a	143	146	128	128	120	120	120	124
16	a	135	135	126	134	128	129	129	132
17	a	139	139	120	121	133	133	127	136
18	a	124	129	130	130	130	130	130	131
19	a	-	-	105	109	105	110	107	110
20	a	143	145	146	147	147	145	146	147
21	a	131	131	123	129	117	125	121	126
22	a	145	144	140	142	138	141	131	143
23	a	131	128	135	140	136	139	137	139
24	a	139	139	140	143	141	141	143	143
25	a	131	132	130	130	122	127	123	126
26	a	123	124	123	113	112	117	119	125
27	a	120	120	106	116	117	116	116	116

Erosion Pin Site 5

Location: see Fig. 3.1 ; erosion pins (all with washers) are arranged as follows:



Pin No.	Initial nature of surface	25.5.71 upper side (mm)	25.5.71 lower side (mm)	15.10.71 upper side (mm)	15.10.71 lower side (mm)	20.4.72 upper side (mm)	20.4.72 lower side (mm)	20.7.72 upper side (mm)	20.7.72 lower side (mm)
1	b	98	97	97	97	91	93	90	91
2	b	67	67	65	65	52	62	58	62
3	b	70	71	68	68	45	44	47	43
4	b	70	68	68	69	54	48	55	51
5	b	70	72	69	71	56	63	60	61
6	b	69	68	67	67	65	65	65	65
7	b	102	100	93	101	65	65	73	71
8	b	74	71	74	74	46	40	57	44
9	b	65	62	64	63	60	60	-	-
10	b	49	50	49	49	45	45	46	47
11	b	71	67	66	66	43	38	43	39
12	b	65	55	52	51	25	21	35	23
13	b	48	41	46	43	38	38	39	39
14	b	54	52	53	55	40	44	44	55
15	b	60	58	56	58	0	0	36	45

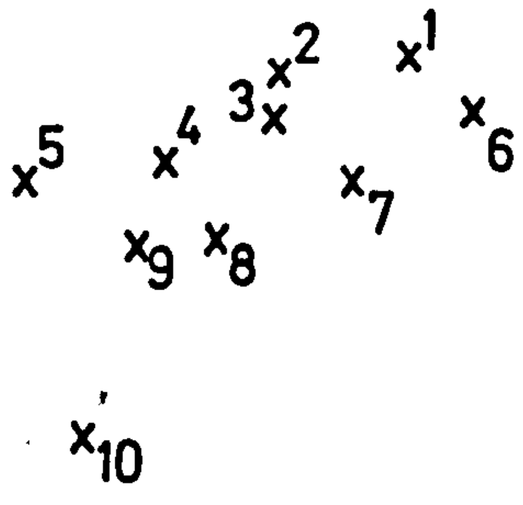
Erosion Pin Site 6

Location: see Fig. 3.1 ; erosion pins are arranged in a line about 0.5m apart, numbered downslope

Pin No.	Initial nature of surface	8.7.71 upper side (mm)	8.7.71 lower side (mm)	15.10.71 upper side (mm)	15.10.71 lower side (mm)	20.4.72 upper side (mm)	20.4.72 lower side (mm)	20.7.72 upper side (mm)	20.7.72 lower side (mm)
1	ab	35	35	43	43	44	48	-	-
2	ab	35	34	36	34	29	32	-	-
3	ab	37	35	35	35	28	30	-	-
4	ab	32	33	32	31	28	28	29	28
5	ab	41	40	37	44	44	47	45	49
6	ab	-	-	27	26	23	23	26	28
7	b	36	36	36	39	34	38	34	37
8	ab	27	25	23	24	22	22	20	20
9	ab	36	36	34	35	28	30	23	31
10	ab	32	35	32	34	30	33	28	32
11	b	47	49	49	50	45	50	46	49

Erosion Pin Site 7

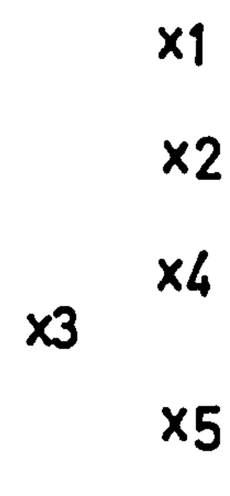
Location: see Fig. 3.1 ; erosion pins are arrayed as follows:



Pin No.	Initial nature of surface	8.7.71 upper side (mm)	8.7.71 lower side (mm)	15.10.71 upper side (mm)	15.10.71 lower side (mm)	20.4.72 upper side (mm)	20.4.72 lower side (mm)	20.7.72 upper side (mm)	20.7.72 lower side (mm)
1	b	56	58	56	57	45	52	51	55
2	b	42	35	34	33	36	35	35	32
3	b	39	40	39	38	35	36	36	36
4	b	40	36	39	38	32	34	34	34
5	b	54	50	51	49	51	49	51	48
6	b	59	61	59	61	56	60	56	61
7	b	24	21	24	20	21	19	20	19
8	b	29	25	26	24	17	20	18	20
9	b	13	11	14	16	10	12	10	13
10	b	39	38	38	35	36	35	35	35

Erosion Pin Site 8

Location: see Fig. 3.1 ; erosion pins are arrayed as follows:



Pin No.	Initial nature of surface	23.6.71 upper side (mm)	23.6.71 lower side (mm)	15.10.71 upper side (mm)	15.10.71 lower side (mm)	20.4.72 upper side (mm)	20.4.72 lower side (mm)	20.7.72 upper side (mm)	20.7.72 lower side (mm)
1	b	40	36	40	38	35	34	36	35
2	b	43	43	43	42	35	42	39	41
3	ab	52	52	52	53	42	49	40	50
4	b	63	62	63	62	60	60	61	60
5	ab	39	40	38	39	20	38	22	36

Erosion Pin Site 9

Location: see Fig. 3.1 ; erosion pins in line numbered downslope.

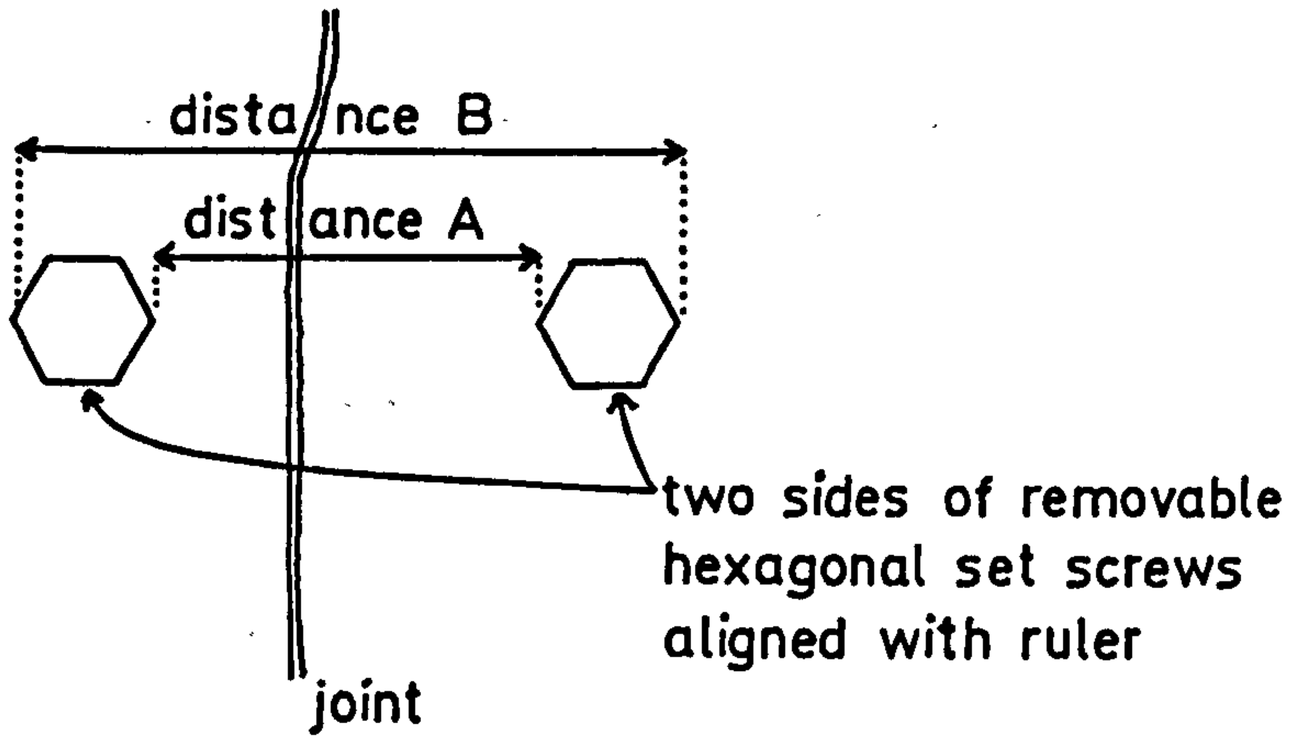
Pin No.	Initial nature of surface	10.6.71		15.10.71		20.4.72		20.7.72	
		upper side (mm)	lower side (mm)	upper side (mm)	lower side (mm)	upper side (mm)	lower side (mm)	upper side (mm)	lower side (mm)
1	g	15	18	19	20	18	19	19	20
2	b	21	19	21	18	20	16	22	17
3	ab	32	32	31	32	27	29	27	28
4	g	36	35	29	28	23	28	23	25
5	g	24	23	20	18	11	11	14	12
6	b	24	25	24	24	8	13	12	13
7	ab	34	33	32	32	29	30	32	32
8	a	33	32	37	37	33	36	35	36
9	ab	48	49	48	48	42	44	43	43
10	a	44	41	36	40	37	42	40	42
11	a	35	35	37	40	33	37	35	40
12	ab	45	45	44	44	37	37	40	43
13	ab	39	39	37	39	33	35	22	34
14	a	22	22	13	13	18	22	14	15

Appendix III.3

Data on Screw-pair Installations

Measurements made on 15.4.71

All readings are means derived using two vernier callipers.



Pair number	Distance A (cm)	Distance B (cm)	Location
1	7.515	10.120	Near point 3 on the sandstone scarp (see Fig. 3.)
2	5.030	7.655	
3	7.800	8.695	
4	6.200	7.380	30 ft. from number 3, near point 6
5	7.820	10.370	
6	7.390	8.620	
7	7.740	8.890	145 ft. from number 6
8	9.205	10.430	90 ft. from number 7
9	6.865	8.100	32 ft. from number 8
10	9.015	10.245	74 ft. from number 9
11	8.865	10.100	
12	8.085	9.320	58 ft. from number 11, near point 49
13	8.450	9.660	
14	6.830	9.380	64 ft. from number 13, near point 54

Appendix III.4

Newly Fallen Sandstone Blocks (>25cm long)

Key: ss - sandstone
sh - shaly or silty sandstone
Dg - Dogger sandstone
* - block in area of yellow painted boulders

Period from 17.11.71 to 10.12.71

Number of cross to west	Distance (m) west of cross	Distance (m) from scarp	Lithology	Length (cm)	Width (cm)	Thickness (cm)
9	0	1.35	ss	28	20	8
9	2.5	2.0	ss	29	15	8
14	0	2.8	ss	29	22	4
14	0	4.0	ss	27	22	1
14	0	4.2	ss	27	26	3
62	2.5	3.0	ss	47	30	5
64	1.2	0.9	ss	51	20	18
64	1.45	0.9	ss	46	17	11
64	1.45	1.1	ss	47	21	11
64	2.0	0.5	ss	30	15	8
64	2.0	0.9	ss	25	12	8
64	3.5	4.15	ss	43	32	3
69	0.1	1.5	ss	43	21	10
69	0.2	2.25	ss	30	25	3

Period from 10.12.71 to 20.4.72

8	0	4.8	Dg	143	70	55
8	0	2.2	ss	34	12	6
8	1.2	1.25	Dg	42	14	8
8	1.5	1.35	Dg	47	9	8
8	1.35	0	Dg	53	50	45
8	1.6	0	Dg	43	25	12
8	1.75	0	Dg	35	25	5
9	3.0	0.9	ss	39	9	8
9	3.0	0.95	ss	30	7	6
10	2.95	0.4	sh	39	31	15
10	3.05	1.2	sh	51	35	18
10	3.1	0.4	sh	30	13	8
10	3.3	1.65	sh	55	36	19
10	3.65	1.4	sh	43	34	15
10	3.65	1.65	sh	35	21	15
10	3.65	1.75	sh	26	16	7
10	3.4	2.35	sh	30	19	8
11	0	2.35	sh	40	33	15
11	0	1.25	sh	30	19	5
11	0.6	1.65	sh	27	18	3

(continued)

(continued)

Number of cross to west	Distance (m) west of cross	Distance (m) from scarp	Lithology	Length (cm)	Width (cm)	Thickness (cm)
11	0.8	2.05	sh	23	20	11
11	1.3	0.2	sh	28	15	14
13	1.0	1.9	sh	43	22	17
15	0	0.2	ss	39	20	5
15	0.3	6.9	ss	33	20	7
15	3.5	5.4	ss	41	20	5
15	3.5	8.0	ss	26	23	5
20	2.8	6.4	ss	37	15	9
20	2.8	2.0	ss	46	13	9
22	1.1	8.5	ss	34	24	3
33	0	0.65	sh	26	16	6
39	2.8	5.1	ss	35	20	5
39	3.8	7.1	ss	32	16	1
39	2.8	8.5	ss	33	14	3
46	0	0.55	ss	25	23	7
46	0	3.8	ss	130	50	29
46	0.9	2.4	ss	31	30	8
45	3.35	4.4	ss	33	10	5
45	3.1	4.4	ss	25	21	5
45	2.8	3.8	ss	27	12	4
45	2.7	5.0	ss	69	40	14
45	2.95	5.65	ss	35	22	8
46	0.55	4.9	ss	25	13	5
45	0.25	5.8	ss	40	27	8
45	0.25	6.0	ss	49	38	11
45	1.15	6.7	ss	35	12	3
45	0	6.0	ss	30	15	2
44	2.4	5.3	ss	25	14	2
44	2.4	6.0	ss	35	28	4
45	0.45	7.35	ss	28	15	5
45	0	8.35	ss	53	35	6
45	0.2	9.1	ss	25	22	3
44	3.6	11.9	ss	63	27	9
44	0.2	11.3	ss	25	19	1
43	0	11.4	ss	60	11	7
43	0	11.5	ss	46	11	4
44	1.6	16.8	ss	35	20	5
44	1.6	17.0	ss	35	20	4
44	1.6	18.0	ss	34	24	9
44	2.5	19.2	ss	31	13	5
44	0.2	21.2	ss	30	18	7
44	1.6	24.8	ss	29	15	8
43	2.9	24.8	ss	33	20	4
44	0	30.7	ss	44	21	9
44	0	32.4	ss	25	19	4
44	2.5	32.9	ss	32	13	6
43	2.6	34.1	ss	120	105	31
43.	2.6	34.9	ss	25	19	4
46	1.2	44.4	ss	25	10	8
46	2.8	48.5	ss	35	19	10
48	0	48.3	ss	55	23	15

(continued)

(continued)

Number of cross to west	Distance (m) west of cross	Distance (m) from scarp	Lithology	Length (cm)	Width (cm)	Thickness (cm)	
46	3.0	54.0	ss	25	16	7	
46	3.4	54.8	ss	30	14	12	
47	1.3	54.6	ss	30	25	10	
49	0.5	42.2	ss	56	19	10	
48	3.3	41.2	ss	60	26	10	
56	1.5	7.7	ss	37	12	5	
57	0	4.4	ss	33	12	6	
60	1.6	1.3	ss	25	22	6	
59	2.7	5.8	ss	26	16	3	
59	2.7	5.6	ss	25	11	5	
62	0	13.8	ss	53	29	6	
63	0.8	11.0	ss	31	22	5	
63	0	2.3	ss	25	15	5	
63	2.7	7.7	ss	42	21	3	
70	1.7	2.5	ss	25	16	6	
67	0	50.6	ss	25	21	8	*
65	3.0	61.6	ss	35	34	5	*
70	3.4	52.8	ss	29	11	9	*
71	1.6	52.8	ss	36	29	12	*
71	1.2	52.35	ss	77	35	22	*
72	0	57.0	ss	32	20	9	*
71	1.2	63.0	ss	74	40	12	*
68	3.7	74.1	ss	36	21	9	*
58	2.1	60.6	ss	47	34	15	*
59	3.6	48.3	ss	25	13	10	*
59	1.4	36.1	ss	47	29	12	*
59	1.4	30.0	ss	42	27	10	*
43	0	36.0	ss	30	17	9	
44	2.8	38.8	ss	75	18	11	
44	2.4	39.5	ss	66	18	6	
43	1.2	54.0	ss	72	40	9	
42	3.7	54.2	ss	25	14	12	*
43	0.2	55.0	ss	30	20	7	*
42	1.3	55.25	ss	25	17	15	*
42	2.0	55.25	ss	25	11	7	*
42	0.6	55.75	ss	33	22	7	*
42	1.3	56.15	ss	25	17	3	*
42	2.3	56.25	ss	30	19	7	*
42	1.3	58.25	ss	33	15	13	*
42	0	57.25	ss	25	25	6	*
41	3.5	59.75	ss	26	22	5	*
41	1.6	60.65	ss	63	31	24	*
42	2.8	61.0	ss	25	14	4	*
42	3.8	56.9	ss	33	17	8	*
44	0	57.4	ss	28	18	10	*
44	1.4	57.2	ss	41	31	9	*
44	0.9	57.4	ss	26	17	14	*
44	1.9	57.3	ss	27	20	3	*
45	0	56.6	ss	27	20	8	*
45	0	58.2	ss	25	12	5	*
44	3.2	58.7	ss	26	17	9	*
45	0.4	59.2	ss	25	14	7	*

(continued)

(continued)

Number of cross to west	Distance (m) west of cross	Distance (m) from scarp	Lithology	Length (cm)	Width (cm)	Thickness (cm)	
45	0	59.9	ss	25	18	6	*
44	2.2	63.8	ss	26	20	10	*
44	2.2	64.7	ss	25	20	5	*
45	0	68.8	ss	29	19	14	*
45	2.7	59.2	ss	26	16	4	*
46	0.5	60.0	ss	35	23	15	*
41	2.0	54.7	ss	26	19	5	*
48	2.9	0.9	ss	75	55	3	
48	3.4	2.6	ss	44	41	3	
48	0.9	2.7	ss	32	28	2	
48	0.3	6.0	ss	55	25	3	
46	0	8.0	ss	33	29	4	
45	3.2	16.2	ss	35	15	7	
45	3.2	15.2	ss	30	15	3	
45	3.3	18.7	ss	34	21	8	
47	0.3	15.2	ss	38	26	3	
45	2.9	44.4	ss	44	18	9	

Period from 20.4.72 to 15.8.72

39	3.6	1.5	sh	35	15	6
39	3.0	1.75	sh	21	20	10
42	0	4.7	sh	39	16	4
63	3.4	4.3	ss	30	7	3
64	0.5	1.2	ss	25	6	2
69	3.3	1.4	ss	27	13	7
69	3.5	1.1	ss	27	18	6
69	3.4	1.0	ss	25	13	5
69	3.8	2.1	ss	25	10	5
69	2.1	1.8	ss	29	25	5
69	3.5	3.0	ss	40	10	5
69	2.7	3.7	ss	30	17	4
69	2.5	4.4	ss	80	40	12
69	2.5	5.0	ss	35	12	2
69	0.5	2.7	ss	25	15	7
70	0.65	1.6	ss	25	13	5
70	1.05	2.4	ss	32	20	6
70	0.7	3.4	ss	25	16	3
70	0	3.4	ss	60	40	12
70	1.2	4.6	ss	30	24	5
70	1.2	4.8	sh	60	37	11
70	0.8	4.6	sh	32	32	8
70	1.0	5.4	ss	55	36	8
70	1.0	6.1	ss	46	24	9
70	0.25	6.6	ss	34	15	6
70	0.2	6.8	ss	27	25	4
70	1.0	7.0	ss	30	11	6
70	0.9	7.4	ss	55	35	11
70	0.9	7.8	ss	40	35	10
70	1.15	7.9	ss	30	27	6

(continued)

(continued)

Number of cross to west	Distance (m) west of cross	Distance (m) from scarp	Lithology	Length (cm)	Width (cm)	Thickness (cm)
70	0.2	7.6	ss	40	27	4
70	0.1	8.0	sh	45	26	5
70	0.6	8.1	ss	25	21	4
70	0.3	8.1	ss	34	34	11
70	0.85	8.4	ss	60	44	8
70	0.35	8.5	ss	45	15	11
70	0.75	9.3	ss	115	58	20
70	1.35	9.4	ss	31	16	5
70	1.2	9.2	ss	27	10	5
70	0.45	10.9	ss	28	15	6
69	2.8	6.6	ss	40	22	7
69	3.1	6.7	ss	26	26	10
69	3.3	6.9	ss	50	35	16
69	3.2	7.4	ss	82	16	15
69	3.4	7.3	ss	35	13	12
69	3.9	7.4	sh	50	29	7
69	3.5	7.8	ss	45	33	5
69	3.8	8.0	sh	46	33	6
69	3.5	7.8	ss	31	26	6
69	3.1	7.9	ss	35	26	6
69	3.9	8.6	ss	63	28	14
69	3.4	8.9	ss	55	30	6
69	3.7	9.1	ss	35	16	6
69	3.7	9.4	ss	40	18	14
69	3.4	9.7	ss	72	52	9
69	3.1	9.7	ss	32	25	5
69	3.1	9.8	ss	32	15	5
69	3.1	9.9	ss	25	15	6
69	2.75	10.0	ss	47	15	10
69	2.2	10.1	ss	42	33	5
69	3.15	10.8	ss	150	95	22
69	3.9	10.2	ss	26	20	4
69	3.9	10.3	ss	26	6	4
70	0	9.7	ss	26	11	5
69	3.9	11.5	ss	41	34	12
69	2.5	11.5	ss	29	13	5
69	2.9	12.4	ss	128	106	25
69	3.6	12.1	ss	46	16	10
69	1.2	11.7	ss	32	19	5
69	2.1	12.7	ss	26	12	5
69	2.0	13.2	ss	40	35	10
69	2.1	14.1	ss	31	20	5
69	2.8	13.7	ss	61	35	12
69	2.8	14.6	ss	34	34	4
70	0	13.0	ss	126	96	25
70	0.85	13.6	ss	150	55	30
70	1.2	13.9	ss	46	34	9
70	1.4	13.4	ss	33	22	3
70	1.7	13.6	ss	31	24	6
70	0.6	12.9	ss	25	17	5
70	0.4	11.2	ss	39	19	5
69	3.6	18.0	ss	30	19	5

(continued)

(continued)

Number of cross to west	Distance (m) west of cross	Distance (m) from scarp	Lithology	Length (cm)	Width (cm)	Thickness (cm)
70	0	19.4	ss	33	24	4
69	0	17.4	ss	76	21	15
69	2.9	19.1	ss	35	12	9
69	3.0	19.9	ss	82	40	10
69	0	21.0	ss	31	22	7
68	3.9	20.9	ss	34	12	4
69	0.9	22.7	ss	54	36	13
70	0	23.2	ss	36	25	9
71	0.5	27.2	ss	53	34	10
69	0	26.9	ss	40	26	5
67	0.5	26.2	ss	46	21	10
70	2.3	1.7	ss	73	31	15
70	2.8	2.1	ss	42	19	11
70	3.1	1.7	sh	35	26	11
71	1.2	2.2	ss	97	62	22
70	1.2	38.0	ss	40	29	4
70	3.6	39.1	ss	42	26	6
69	0	38.1	ss	34	20	3
70	2.5	41.5	ss	38	12	7
71	0	56.2	ss	41	35	31
69	2.5	55.4	ss	36	25	2
66	1.0	58.0	ss	135	35	31
66	2.5	67.0	ss	35	30	9
70	0	71.0	ss	34	32	6
70	3.0	70.0	ss	32	19	4
72	3.5	66.5	ss	103	29	20
72	2.5	71.0	ss	52	48	13
70	3.0	63.5	ss	28	26	25
66	0	26.2	ss	43	15	6
68	0	12.0	ss	38	37	5
71	1.5	1.5	sh	35	20	10
71	1.5	1.6	sh	25	20	7
71	0	3.0	sh	26	15	13

Appendix III.5

Data on the Overhang of the Sandstone Scarp

Key:

No. - number of paint cross; crosses are 4m apart (see Fig. 3.1)

Lith. - lithology on which cross lies:

ss - sandstone
sh - silty shale
Dg - Dogger Sandstone

Dist. overhang - horizontal distance (cm) from cross to tip of overhang

Dist. underhang - horizontal distance (cm) from cross to tip of underhang

No.	Lith.	Dist. (cm) over-hang	Dist. (cm) under-hang
1	Dg	0	0
2	Dg	42	0
3	Dg	156	0
4	Dg	221	0
5	Dg	134	82
6	Dg	142	54
7	Dg	170	15
8	Dg	184	34
9	Dg	211	0
10	ss	229	19
11	ss	175	85
12	ss	151	0
13	ss	128	15
14	ss	105	13
15	ss	192	0
16	ss	130	0
17	ss	78	0
18	ss	93	0
19	ss	23	0
20	ss	78	0
21	ss	77	0
22	Dg	143	0
23	Dg	112	0
24	Dg	208	0
25	Dg	215	0
26	Dg	221	0
27	Dg	250	45
28	Dg	334	59
29	Dg	349	34
30	Dg	392	0
31	Dg	224	33
32	Dg	261	0
33	Dg	273	0
34	Dg	220	0
35	Dg	440	0
36	Dg	200	0
37	Dg	165	0
38	Dg	76	50
39	Dg	380	0
40	Dg	244	0
41	ss	67	65
42	ss	30	0
43	ss	9	5
44	ss	32	93
45	ss	0	0
46	ss	9	0
47	ss	8	25
48	ss	111	0
49	ss	39	0
50	ss	7	0
51	ss	28	15
52	ss	53	63
53	Dg	151	0
54	Dg	190	0
55	Dg	93	0
56	Dg	17	130
57	Dg	0	90
58	Dg	177	0(250)
59	Dg	167	0(250)
60	Dg	51	35(420)
61	ss	90	276
62	ss	92	81
63	ss	78	21
64	ss	18	46
65	ss	43	0
66	ss	41	37
67	ss	115	38
68	ss	118	57
69	sh	96	0
70	ss	171	86
71	sh	253	0
72	sh	127	0
73	ss	25	21

APPENDIX IV

MICRO-EROSION METER DATA

Introduction

The M.E.M. data of Appendix IV have been derived by means of the micro-erosion meter described in Appendix II and owned by the Department of Geography, the University of Leeds. It is doubtful whether readings made with another instrument, even one with the same specifications, at the M.E.M. sites would be truly comparable with the data given here.

The sites are arranged in order from south-east to north-west. General data, M.E.M. data and, where appropriate, beach data are given for each site. The general data refer mainly to the location of the site and to the orientation of the instrument on each M.E.M. unit. Despite the information that is given it is usually necessary to have great patience and sharp eyes to find the units in the field.

The M.E.M. data (measurements in inches) are readily intelligible. Where two successive sets of readings for a particular unit are not comparable because, for example, some or all of the M.E.M. studs had been removed by marine erosion or vandalism in the intervening period, two parallel vertical lines separate the readings. A hyphen taking the place of a reading indicates that none was taken because either the unit could not be found or the sea was covering the unit.

The beach data (in inches) show the height of the M.E.M. stud above (positive) or below (negative) the surface of the beach where the unit is on a vertical face. Where the unit is beneath the beach covering a ramp the distance below the surface of the beach is positive. For those times when no beach covered the unit, either there is a blank in the data or the word "bare" is given. A hyphen has the same meaning as above.

Cobble Beach, White Stone Hole - General Data

Grid reference: 94850770

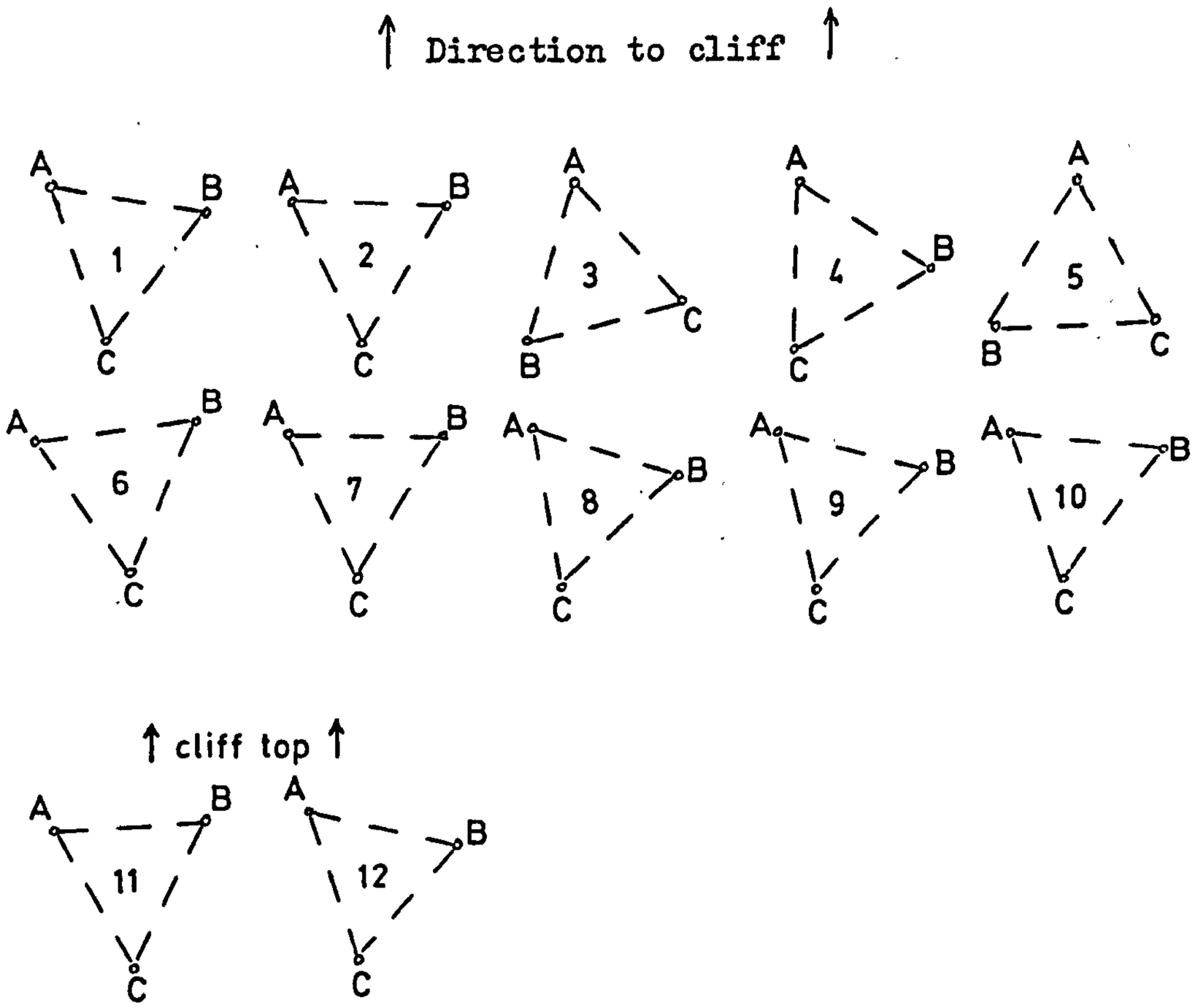
Geology: Jet Rock Series

Location of units: distance from unit 1 to unit 2 = 19.5 feet
2 to unit 3 = 18.75 feet
3 to unit 4 = 5.25 feet*
4 to unit 5 = 7 feet*
5 to unit 6 = 7.5 feet*
6 to unit 7 = 18.5 feet*
7 to unit 8 = 22.75 feet*
8 to unit 9 = 15 feet*
9 to unit 10 = 18.75 feet*
10 to unit 11 = 4 feet**
11 to unit 12 = 2 feet toward Whitby**

(* units 4 to 10 are usually under cobble beach)
(** units 11 and 12 were sited on vertical joint planes at the cliff foot)

See also Fig.5·16b

Orientation of M.E.M.:



Cobble Beach, White Stone Hole - M.E.M. Data

Unit no.	Flat leg on	Dates of measurements							
		12.11. 70	18.1. 71	14.3. 71	4.5. 71*	1.7. 71	3.9. 71	19.4. 72**	13.7. 72
1	A	2.263	2.223	2.150	2.143	2.134	2.132	1.998	1.995
	B	2.199	2.105	2.087	2.042	2.039	2.001	1.882	1.841
	C	2.298	2.184	2.179	2.176	2.114	2.059	1.932	1.920
2	A	1.898	1.861	1.826	1.812	1.805	1.726	1.645	1.649
	B	1.906	1.896	1.879	1.853	1.809	1.749	1.703	1.557
	C	1.948	1.907	1.845	1.826	1.785	1.776	1.650	1.640
3	A	2.117	2.002	1.986	1.955	1.900	1.782	1.482	1.477
	B	2.003	1.939	1.909	1.890	1.785	1.660	1.413	1.208
	C	1.989	1.930	1.919	1.902	1.891	1.799	1.501	1.495
4	A	1.841	1.716	1.647	1.522	1.504	1.410	1.206	1.187
	B	1.815	1.702	1.635	1.526	1.515	1.415	1.198	1.181
	C	1.863	1.736	1.668	1.590	1.579	1.474	1.248	1.218
5	A	2.096	2.001	1.979	1.953	1.652	1.650	1.413	1.404
	B	2.001	1.917	1.890	1.858	1.615	1.614	1.228	1.223
	C	2.006	1.938	1.914	1.874	1.791	1.788	1.417	1.405
6	A	1.913	1.837	1.833	-	1.826	1.824	1.644	1.638
	B	1.906	1.820	1.818	-	1.810	1.809	1.576	1.571
	C	1.832	1.826	1.720	-	1.707	1.703	1.485	1.481
7	A	1.642	1.620	1.559	1.317	1.282	1.263	0.971	0.962
	B	1.691	1.590	1.534	1.481	1.449	1.409	1.099	1.083
	C	1.482	1.458	1.419	1.265	1.255	1.244	0.886	0.880
8	A	1.990	1.785	1.673	1.651	1.660	1.545	1.128	0.997
	B	1.949	1.708	1.697	1.679	1.644	1.405	0.991	0.923
	C	1.717	1.674	1.655	1.636	1.638	1.322	0.820	0.815
9	A	-	1.985	1.963	1.944	1.944	-	1.640	1.635
	B	-	1.912	1.907	1.897	1.897	-	1.563	1.562
	C	-	1.882	1.875	1.854	1.702	-	1.493	1.493
10	A	2.060	2.062	2.073	2.073	2.077	-	1.858	-
	B	1.977	1:983	2.008	2.002	2.003	-	1.851	-
	C	2.046	2.052	1.909	1.911	1.913	-	1.893	-
11	A	2.347	2.348	2.348	2.349	2.348	-		
	B	2.377	2.379	2.379	2.381	2.380	-		
	C	2.354	2.356	2.355	2.354	2.354	-		
12	A	1.703	1.702	1.706	1.709	1.709	-		
	B	1.330	1.335	1.334	1.335	1.334	-		
	C	1.453	1.348	1.345	1.352	1.350	-		

* units 5 to 7 measured on 5.5.71
** units 7 to 10 measured on 17.4.72

Cobble Beach, White Stone Hole - Beach Data

Unit no.	Dates of measurements							
	12.11. 70	18.1. 71	14.3. 71	4.5. 71	1.7. 71	3.9. 71	19.4. 72	13.7. 72
1								thin mud
2								thin mud
3		cobbles 6 in.						
4	shale 2 in.	cobbles 6 in.			boulder	boulder	boulder	cobbles and shale
5	shale 5 in.	cobbles, shale 6 in.	shale 4 in.	cobbles, shale 4 in.	boulder	pebbles 12 in.		cobbles, shale 3 in.
6	shale 6 in.	cobbles, shale 6 in.	cobbles, shale 7 in.	- - -	boulder; shale 6 in.	boulder		cobbles, shale 3 in.
7	shale 8 in.	cobbles, shale 6 in.	boulders; shale 3 in.	cobbles, shale 3 in.			boulder	cobbles, shale 3 in.
8.	shale 4 in.			shale 1 in.				shale 5 in.
9	boulder	shale 2 in.						shale 6 in.
10	shale 4.5 in.			shale 2 in.			shale 15 in.	thick talus shale
11								
12								

Shale Beach, White Stone Hole - General Data

Grid reference: 94830773

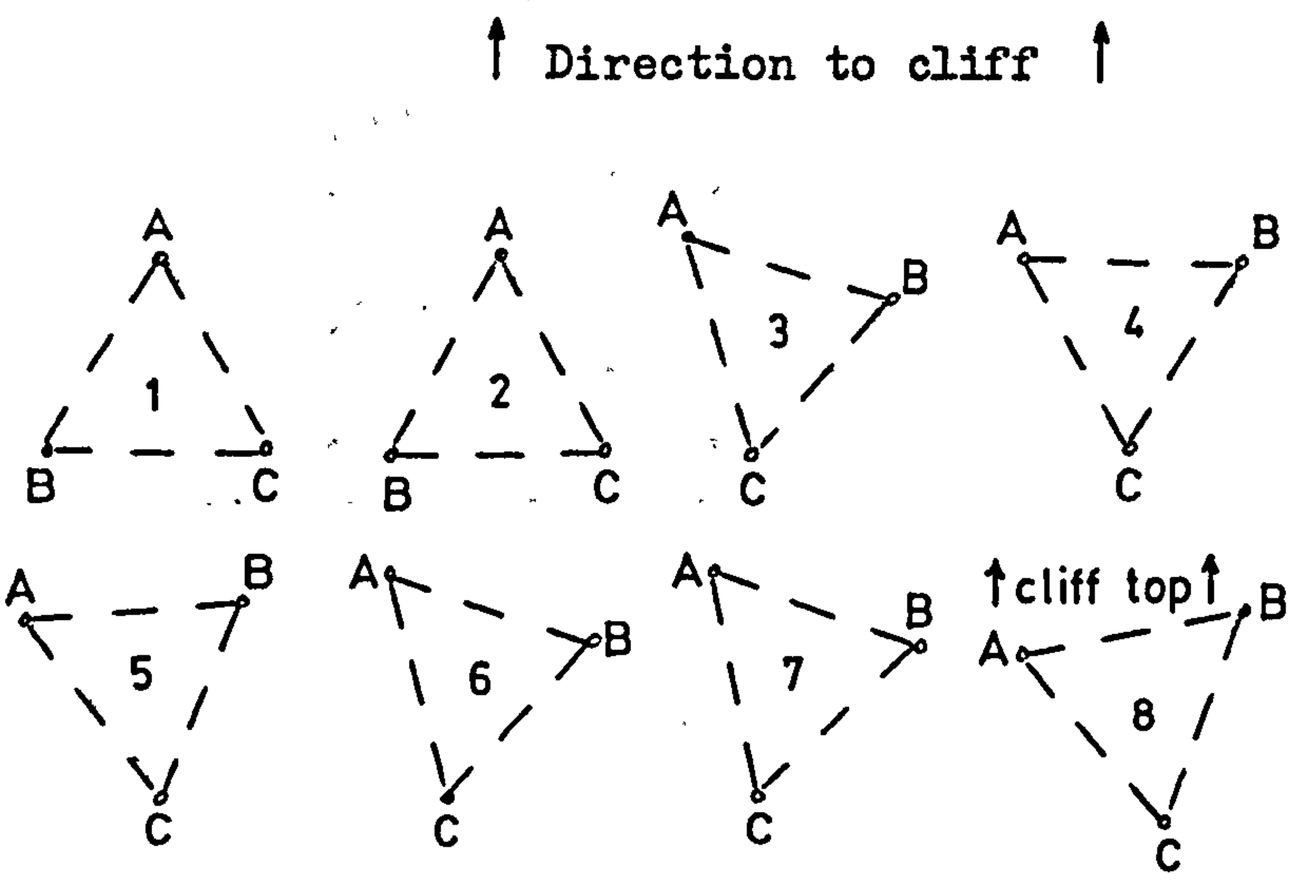
Geology: Jet Rock Series

Location of units: distance from unit 1 to unit 2 = 65 feet
2 to unit 3 = 41.5 feet*
3 to unit 4 = 20 feet*
4 to unit 5 = 18.75 feet*
5 to unit 6 = 15.7 feet*
6 to unit 7 = 23 feet*
7 to unit 8 = 3 feet**

(* units 3 to 7 are usually under beach)
(** unit 8 is sited on a vertical joint plane at the cliff foot)

See also Fig.5·16c

Orientation of M.E.M.:



Shale Beach, White Stone Hole - M.E.M. Data

Unit no.	Flat leg on	Dates of measurements							
		12.11. 70	18.1. 71	14.3. 71	5.5. 71*	1.7. 71	2.9. 71	17.4. 72**	13.7. 72
1	A	1.230	1.230	1.229	1.227	1.226	1.224	1.223	1.221
	B	1.242	1.243	1.241	1.239	1.236	1.233	1.232	1.230
	C	1.303	1.302	1.300	1.298	1.296	1.295	1.294	1.292
2	A	2.101	2.093	2.087	2.079	2.070	-	2.038	-
	B	2.101	2.087	2.080	2.071	2.064	-	2.025	-
	C	2.111	2.104	2.100	2.092	2.088	-	2.063	-
3	A	2.019	1.986	1.837	1.828	1.810	-	1.762	1.705
	B	1.809	1.796	1.785	1.775	1.755	-	1.697	1.690
	C	1.853	1.836	1.814	1.785	1.765	-	1.714	1.711
4	A	2.103	2.040	2.006	1.996	1.985	-	1.910	1.900
	B	2.073	2.038	1.983	1.968	1.966	-	1.850	1.843
	C	2.090	2.057	1.997	1.983	1.975	-	1.880	1.878
5	A	1.866	1.858	1.854	1.750	1.749	-	1.741	1.734
	B	1.792	1.762	1.763	1.765	1.764	-	1.735	1.740
	C	1.767	1.753	1.750	1.746	1.745	-	1.697	1.693
6	A	2.088	2.080	2.077	2.077	2.073	-	2.057	2.054
	B	2.067	2.055	2.055	2.055	2.054	-	2.038	2.032
	C	2.092	2.086	2.081	2.082	2.080	-	2.061	2.056
7	A	2.060	2.058	2.056	2.054	2.051	-		
	B	2.083	2.083	2.042	2.039	2.036	-		
	C	2.110	2.083	2.080	2.074	2.071	-		
8	A	2.179	2.178	2.180	2.180	2.180	-	2.210	-
	B	2.514	2.513	2.518	2.512	2.527	-	2.486	-
	C	2.425	2.426	2.406	2.406	2.406	-	2.429	-

* Units 1 and 2 measured on 4.5.71
** Unit 1 measured on 19.4.72

Shale Beach, White Stone Hole - Beach Data

Unit no.	Dates of measurements							
	12.11. 70	18.1. 71	14.3. 71	5.5. 71	1.7. 71	2.9. 71	17.4. 72	13.7. 72
1								thin mud
2						-		-
						-		-
						-		-
3				shale 2 in.		-	pebbles 3 in.	
						-		
						-		
4				shale 4 in.		-		
						-		
						-		
5		shale 2 in.	shale 6 in.	shale 9 in.	shale 6 in.	-	shale 12 in.	cobbles 6 in.
						-		
						-		
6			shale 8 in.	shale 7 in.	shale 25 in.	-	shale 12 in.	shale 9 in.
						-		
						-		
7				shale 3 in.	shale 6 in.	-		shale talus
						-		
8						-		shale talus
						-		

White Horse Conglomerate Area - General Data

Grid reference: 94850778

Geology: Jet Rock Series (units 1, 2, 4 and 5) and Conglomerate (units 3 and 6)

Location of units: Units 1, 2 and 3 are at the easternmost point of the conglomerate.

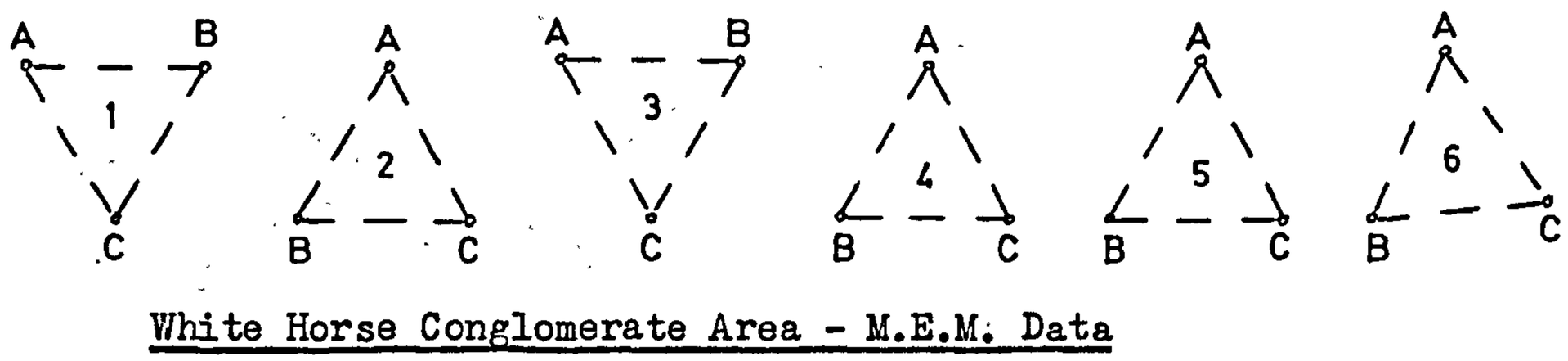
distance from unit 1 to unit 2 = 4 feet
2 to unit 3 = 2 feet and 2 feet towards sea

Units 4, 5 and 6 are 40.5 feet west of units 1, 2 and 3

distance from unit 4 to unit 5 = 2 feet
5 to unit 6 = 1 foot

Orientation of M.E.M.:

↑ Direction to centre of conglomerate area ↑



White Horse Conglomerate Area - M.E.M. Data

Unit no.	Flat leg on	Dates of measurements					
		27.11. 70	19.1. 71	14.3. 71	1.7. 71	19.4. 72	13.7. 72
1	A		1.322	1.257	1.256	1.251	1.253
	B		1.166	1.165	1.165	1.162	1.163
	C		1.237	1.235	1.232	1.222	1.223
2	A		1.698	1.696	1.692	1.545	1.537
	B		1.505	1.502	1.487	1.406	1.404
	C		1.534	1.531	1.492	1.487	1.485
3	A		1.542	1.536	1.536		
	B		1.465	1.460	1.461		
	C		1.488	1.124	1.110		
4	A	2.226	2.225	2.225	2.223	2.211	2.210
	B	1.994	1.993	1.991	1.991	1.991	1.991
	C	2.170	2.170	2.169	2.167	2.168	2.171
5	A	2.161	2.156	2.158	2.133	2.076	2.078
	B	2.125	2.127	2.126	1.972	1.836	1.838
	C	1.998	1.995	1.993	1.875	1.869	1.870
6	A		1.808	1.802	1.804	1.804	-
	B		1.688	1.684	1.684	1.678	-
	C		1.166	1.147	1.151	1.149	-

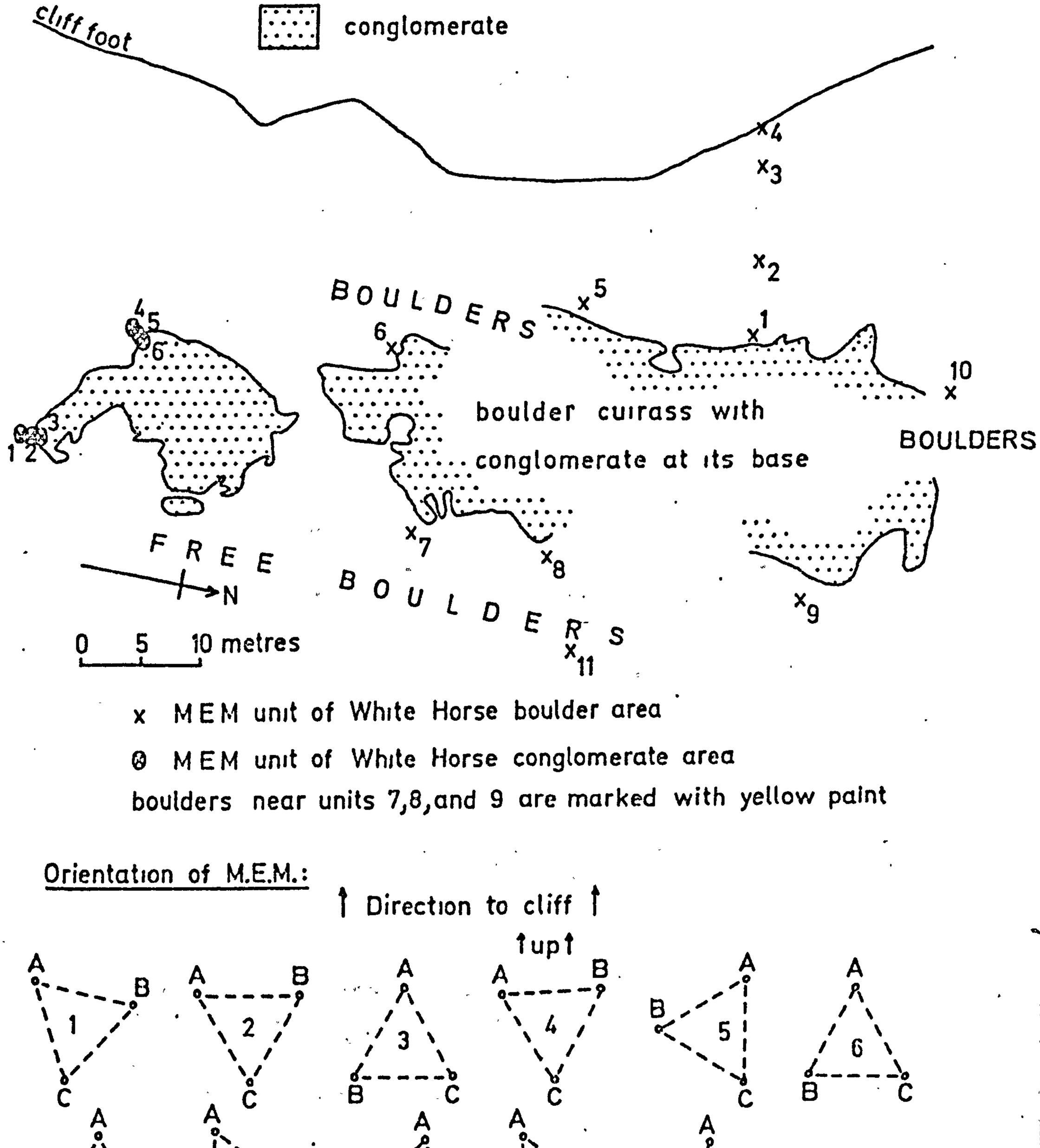
White Horse Boulder Area

General Data

Grid reference: 94850778

Geology: Jet Rock Series

Location of units:

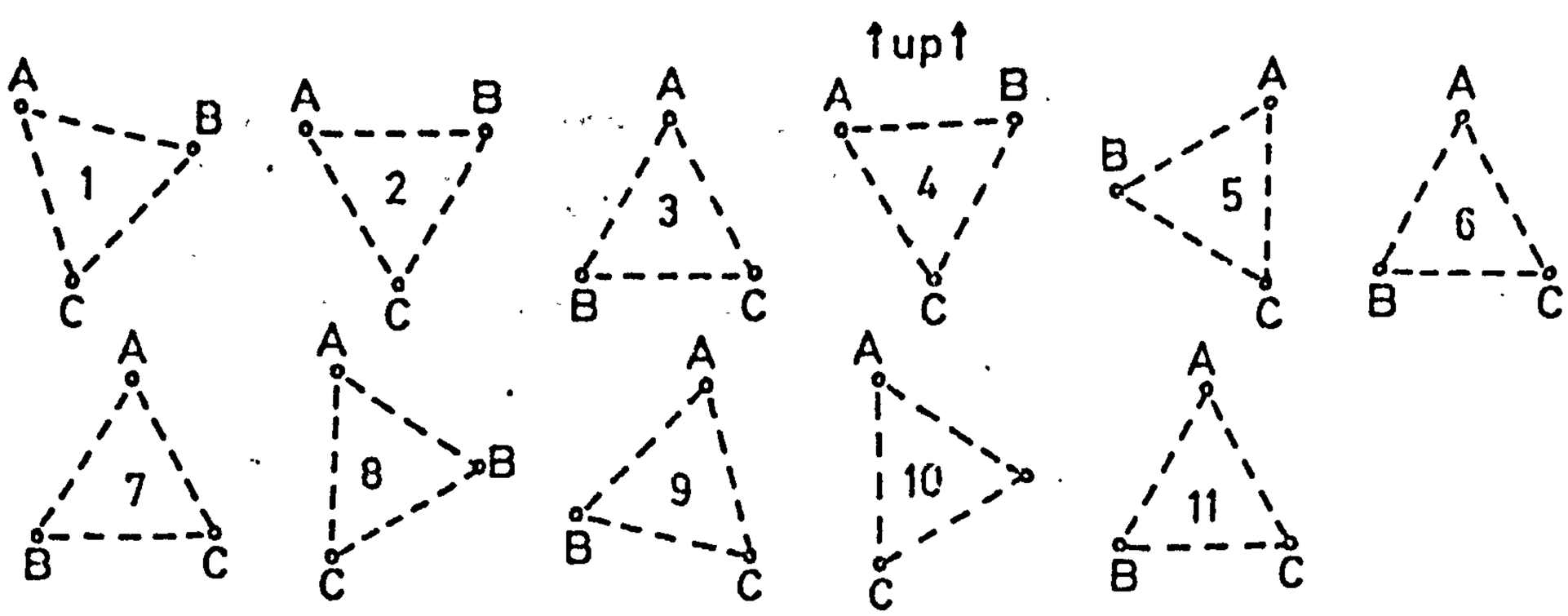


x MEM unit of White Horse boulder area

⊗ MEM unit of White Horse conglomerate area

boulders near units 7,8,and 9 are marked with yellow paint

Orientation of M.E.M.:



White Horse Boulder Area - M.E.M. Data

Unit no.	Flat leg on	Dates of measurements							
		27.11.70 (1)	19.1.71	14.3.71	4.5.71 (2)	1.7.71	2.9.71 (3)	17.4.72	13.7.72
1	A	2.089	2.085	2.084	2.079	2.079	2.082	2.081	2.083
	B	2.005	2.008	2.007	2.006	2.005	2.006	2.005	2.011
	C	1.999	1.998	1.998	2.004	2.009	2.042	2.014	2.027
2	A	1.783	1.783	1.782	1.782	1.786	1.790	1.781	1.799
	B	1.837	1.835	1.834	1.840	1.842	1.847	1.803	1.838
	C	1.746	1.744	1.743	1.741	1.748	1.751	1.749	1.756
3	A	1.607	1.605	1.604	1.602	1.614	1.614	1.434	1.441
	B	1.456	1.463	1.458	1.457	1.462	1.464	1.465	1.469
	C	1.471	1.472	1.472	1.474	1.475	1.480	1.489	1.494
4	A	2.930	2.975	2.995	3.069	3.070	3.204	0.122	-
	B	2.940	2.963	2.988	3.056	3.055	3.355	3.142	-
	C	2.811	2.744	2.761	2.706	2.706	3.232	0.371	-
5	A		0.796	-**	0.794	0.796	0.792**	0.783	0.787
	B		0.751	-**	0.750	0.745	0.742**	0.737	0.751
	C		0.767	-**	0.769	0.769	0.758**	0.756	0.763
6	A		1.269	1.268	1.264	1.266	-	1.220*	1.206*
	B		1.201	1.200	1.197	1.200	-	1.086*	1.086*
	C		1.192	1.191	1.188	1.191	-	1.154*	1.115*
7	A		1.130	1.125	1.124	1.123	1.122	1.056	1.055
	B		0.942	0.942	0.941	0.941	0.940	0.914	0.914
	C		1.033	1.031	1.030	1.028	1.027	1.022	1.020
8	A		1.301	1.300	1.299	1.299	1.300	1.298	1.299
	B		1.390	1.390	1.389	1.389	1.388	1.386	1.387
	C		1.310	1.310	1.309	1.309	1.308	1.307	1.310
9	A		1.005	1.005	1.004	1.004*	1.003*	1.003	1.002
	B		1.015	1.015	1.017	1.015*	1.014*	1.013	1.013
	C		0.976	0.976	0.975	0.975*	0.976*	0.954	0.953
10	A		1.020	1.019	1.014	1.017	1.019	-	1.018
	B		0.973	0.970	0.969	0.972	0.972	-	0.974
	C		1.030	1.029	1.025	1.027	1.027	-	1.025
11	A				0.997	0.993	0.993	0.943	-*
	B				0.942	0.940	0.940	0.903	-*
	C				0.962	0.960	0.960	0.923	-*

(1) Units 3 and 4 measured on 12.11.70
(2) Units 1 to 4 measured on 5.5.71
(3) Units 1 to 5 measured on 3.9.71
* boulder or cobbles covering unit
** shale fragments covering unit

Mosaic A, Saltwick Bay - General Data

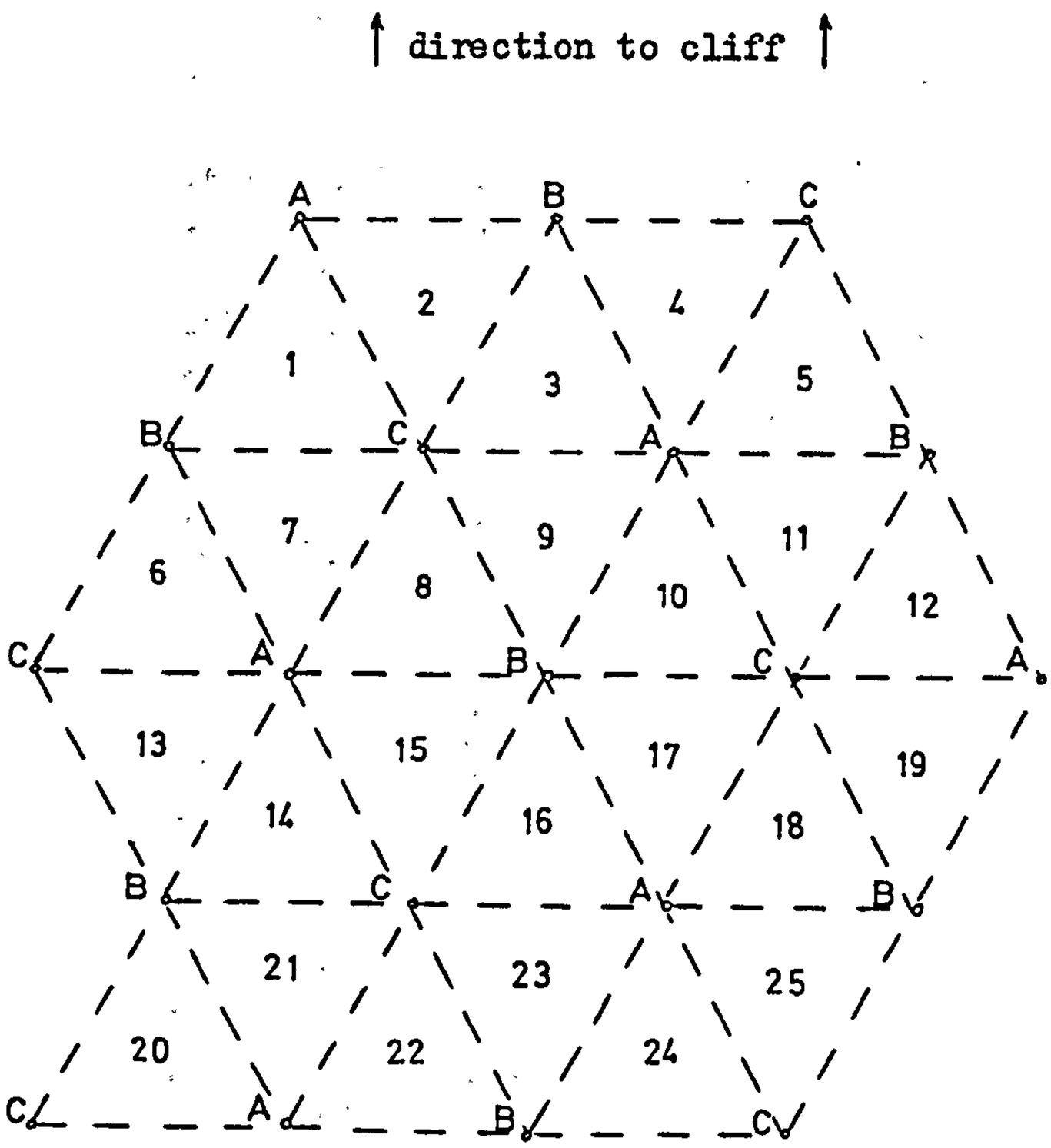
Grid reference: 91581106

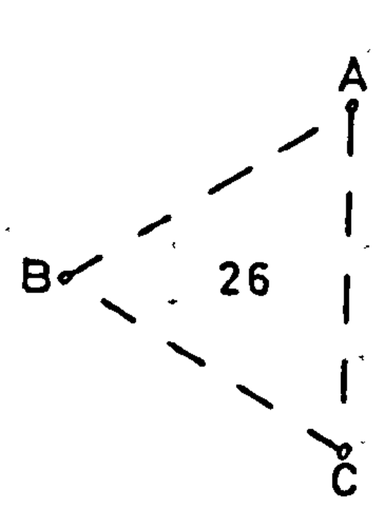
Geology: Bituminous Shales; stratum 45 of Howarth (1962)

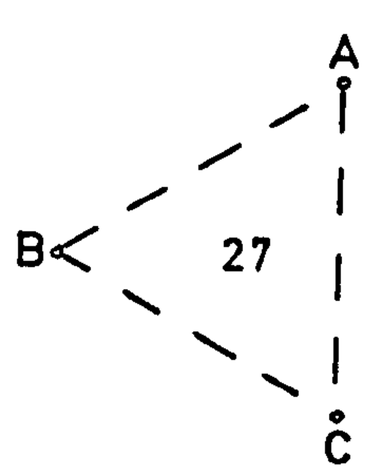
Location of units: on western side of Saltwick Bay and about 140 feet seaward of mosaic B which is at the cliff foot

unit 26 is 30 cm and unit 27 80 cm toward Whitby from stud 12A

Orientation of M.E.M.:







Mosaic A, Saltwick Bay - M.E.M. Data

Unit no.	Flat leg on	Dates of measurements							
		1.11. 70	5.1. 71	28.2. 71	5.5. 71	23.6. 71	6.10. 71	10.4. 72	10.7. 72
1	A	1.646	1.650	1.610	1.609	1.607	1.607	1.602	1.604
	B	1.715	1.720	1.723	1.720	1.720	1.723	1.718	1.719
	C	1.683	1.688	1.698	1.696	1.635	1.635	1.630	1.633
2	A	1.619	1.624	1.643	1.638	1.637	1.531	1.521	1.530
	B	1.510	1.516	1.519	1.520	1.520	1.527	1.472	1.474
	C	1.569	1.568	1.578	1.576	1.575	1.576	1.572	1.584
3	A	1.649	1.651	1.655	1.654	1.654	1.628	1.619	1.623
	B	1.508	1.517	1.519	1.518	1.519	1.521	1.541	1.445
	C	1.641	1.646	1.647	1.649	1.650	1.647	1.457	1.461
4	A	1.699	1.707	1.711	1.713	1.713	1.715	1.590	1.597
	B	1.533	1.540	1.447	1.443	1.445	1.440	1.390	1.395
	C	-	1.449	1.449	1.447	1.448	1.447	1.442	1.441
5	A	1.688	1.690	1.692	1.692	1.692	1.685	1.627	1.629
	B	1.600	1.604	1.608	1.610	1.610	1.607	1.595	1.601
	C	-	1.603	1.607	1.605	1.608	1.571	1.559	1.561
6	A	1.647	1.646	1.647	1.650	1.646	1.644	1.495	1.493
	B	1.785	1.786	1.791	1.696	1.697	1.657	1.626	1.625
	C	1.832	1.836	1.840	1.836	1.830	1.683	1.681	1.672
7	A	1.628	1.612	1.614	1.620	1.609	1.602	1.581	1.550
	B	1.660	1.663	1.664	1.668	1.673	1.628	1.593	1.590
	C	1.566	1.570	1.572	1.572	1.572	1.574	1.580	1.561
8	A	1.545	1.544	1.548	1.545	1.543	1.540	1.500	1.497
	B	1.638	1.639	1.643	1.625	1.627	1.642	1.626	1.630
	C	1.649	1.648	1.590	1.600	1.590	1.592	1.590	1.590
9	A	1.777	1.781	1.801	1.749	1.750	1.748	1.744	1.712
	B	1.718	1.718	1.720	1.719	1.717	1.719	1.717	1.717
	C	1.698	1.655	1.656	1.658	1.659	1.658	1.659	1.590
10	A	1.734	1.737	1.740	1.673	1.675	1.674	1.670	1.669
	B	1.668	1.667	1.667	1.666	1.664	1.660	1.640	1.640
	C	1.631	1.609	1.608	1.607	1.607	1.604	1.600	1.600
11	A	1.740	1.742	1.745	1.763	1.717	1.717	1.628	1.626
	B	1.638	1.642	1.644	1.633	1.631	1.588	1.634	1.618
	C	1.670	1.673	1.674	1.672	1.672	1.669	1.665	1.667
12	A	1.595	1.594	1.596	1.594	1.594	1.590	1.594	1.588
	B	1.490	1.497	1.493	1.492	1.491	1.490	1.473	1.470
	C	1.664	1.661	1.664	1.660	1.662	1.656	1.603	1.600
13	A	1.581	1.583	1.581	1.583	1.582	1.581	1.580	1.584
	B	1.680	1.685	1.687	1.700	1.602	1.598	1.596	1.541
	C	1.720	1.721	1.732	1.670	1.666	1.660	1.658	1.652
14	A	1.569	1.574	1.573	1.575	1.561	1.558	1.557	1.550
	B	1.618	1.640	1.645	1.654	1.653	1.550	1.548	1.545
	C	1.637	1.652	1.658	1.655	1.656	1.650	1.598	1.597

(continued)

(continued)

Unit no.	Flat leg on	Dates of measurements							
		1.11. 70	5.1. 71	28.2. 71	5.5. 71	23.6. 71	6.10. 71	10.4. 72	10.7. 72
15	A	1.373	1.372	1.376	1.373	1.375	1.372	1.375	1.375
	B	1.533	1.533	1.539	1.533	1.534	1.523	1.509	1.508
	C	1.524	1.532	1.526	1.533	1.532	1.540	1.491	1.505
16	A	1.585	1.567	1.567	1.569	1.571	1.573	1.499	1.498
	B	1.522	1.530	1.529	1.530	1.532	1.528	1.527	1.521
	C	1.532	1.537	1.543	1.552	1.528	1.523	1.533	1.525
17	A	1.650	1.651	1.653	1.591	1.592	1.574	1.512	1.513
	B	1.675	1.677	1.678	1.682	1.623	1.620	1.623	1.630
	C	1.591	1.591	1.594	1.593	1.593	1.590	1.573	1.573
18	A	1.652	1.654	1.657	1.656	1.658	1.608	1.548	1.547
	B	1.737	1.743	1.751	1.752	1.755	1.756	1.635	1.520
	C	1.697	1.698	1.708	1.707	1.708	1.706	1.692	1.692
19	A	1.726	1.726	1.730	1.726	1.719	1.725	1.724	1.725
	B	1.714	1.713	1.719	1.719	1.721	1.628	1.580	1.580
	C	1.792	1.790	1.797	1.780	1.779	1.765	1.730	1.683
20	A	1.757	1.756	1.755	1.755	1.753	1.703	1.578	1.574
	B	1.735	1.740	1.741	1.748	1.747	1.683	1.647	1.648
	C	1.815	1.814	1.814	1.817	1.818	1.769	1.645	1.642
21	A	1.698	1.686	1.699	1.698	1.696	1.671	1.533	1.532
	B	1.705	1.707	1.712	1.628	1.629	1.617	1.614	1.613
	C	1.710	1.710	1.713	1.720	1.568	1.568	1.569	1.570
22	A	1.770	1.736	1.739	1.742	1.742	1.622	1.531	1.535
	B	1.816	1.820	1.826	1.822	1.798	1.744	1.645	1.642
	C	1.748	1.722	1.725	1.728	1.654	1.623	1.560	1.567
23	A	1.596	1.602	1.603	1.611	1.595	1.499	1.502	1.502
	B	1.694	1.700	1.700	1.702	1.703	1.702	1.631	1.580
	C	1.612	1.617	1.622	1.642	1.554	1.553	1.558	1.513
24	A	1.578	1.515	1.516	1.534	1.485	1.481	1.483	1.492
	B	1.675	1.681	1.680	1.680	1.677	1.643	1.630	1.620
	C	1.566	1.569	1.571	1.572	1.570	1.572	1.566	1.511
25	A	1.646	1.644	1.649	1.647	1.650	1.614	1.561	1.567
	B	1.752	1.762	1.766	1.766	1.767	1.734	1.703	1.630
	C	1.571	1.573	1.576	1.572	1.572	1.570	1.559	1.567
26	A	1.726	1.723	1.725	1.721	1.724	1.718	1.707	1.704
	B	1.781	1.780	1.781	1.781	1.791	1.730	1.731	1.741
	C	1.762	1.760	1.763	1.759	1.759	1.760	1.756	1.755
27	A	1.760	1.762	1.764	1.758	1.757	1.749	1.700	1.700
	B	1.680	1.680	1.678	1.674	1.675	1.682	1.676	1.673
	C	1.760	1.760	1.757	1.757	1.754	1.755	1.748	1.746

Mosaic B, Saltwick Bay - General Data

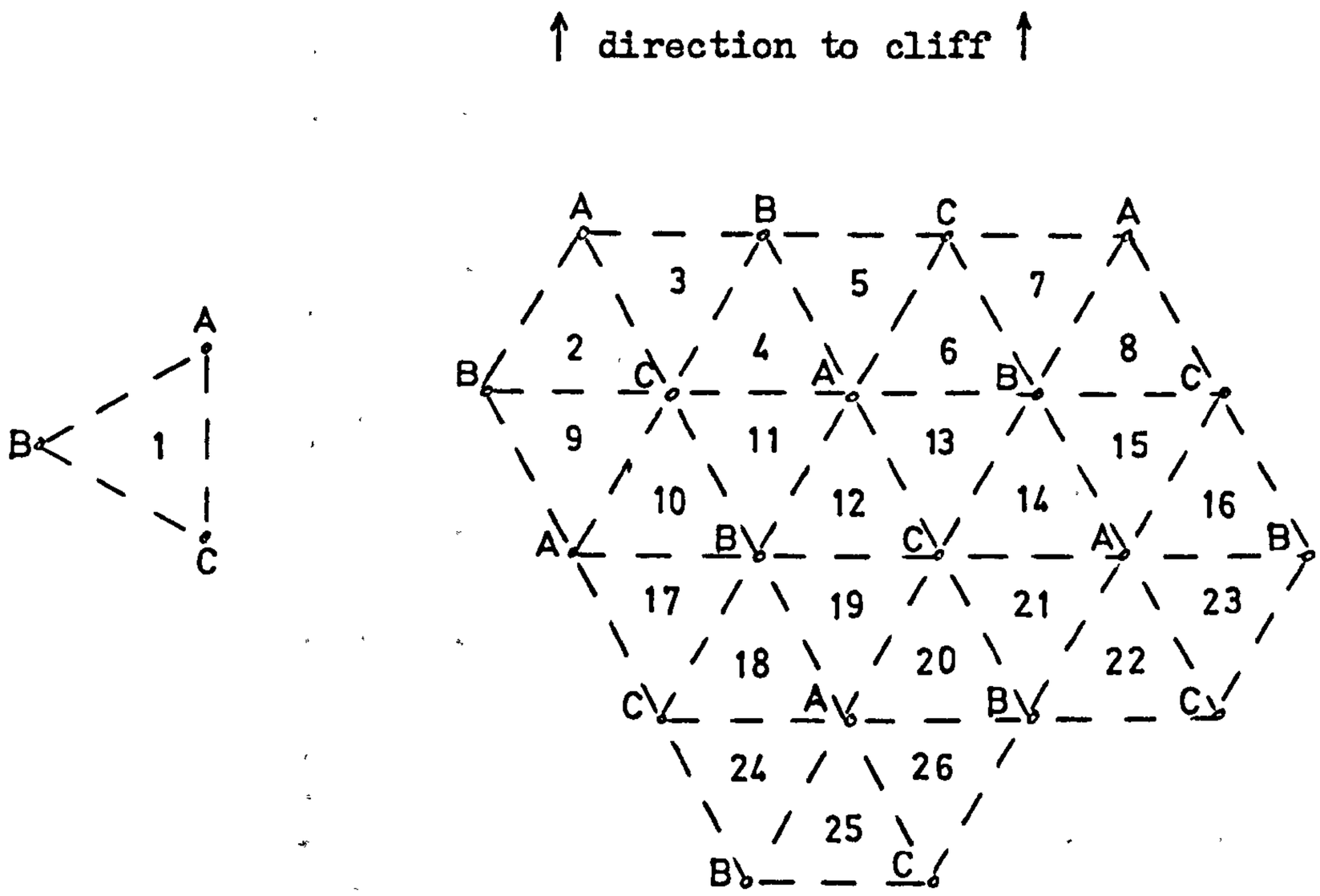
Grid reference: 91531106

Geology: Bituminous Shales; stratum 47 of Howarth (1962)

Location of units: at the landward edge of the shore platform on the western side of Saltwick Bay

unit 1 is 26 cm toward head of bay from stud 2B

Orientation of M.E.M.



Mosaic B, Saltwick Bay - M.E.M. Data

Unit no.	Flat leg on	Dates of measurements							
		1.11. 70	1.1. 71	28.2. 71	4.5. 71	22.6. 71	2.9. 71	11.4. 72	10.7. 72
1	A	2.149	2.151	2.145	2.097	1.965	1.758	1.650	1.555
	B	2.126	2.121	2.107	2.105	1.945	1.707	1.649	1.534
	C	2.125	2.037	2.038	2.036	1.962	1.713	1.544	1.449
2	A	1.888	1.887	1.881	1.836	1.594	1.495	1.365	1.284
	B	1.959	1.920	1.870	1.818	1.711	1.439	1.369	1.267
	C	1.908	1.907	1.903	1.839	1.750	1.519	1.319	1.335
3	A	1.983	1.982	1.976	1.975	1.777	1.608	1.500	1.402
	B	2.088	1.876	1.875	1.874	1.877	1.399	1.391	1.390
	C	2.091	1.974	1.950	1.948	1.843	1.541	1.409	1.385
4	A	1.964	1.997	1.974	1.970	1.914	1.789	1.753	1.684
	B	2.088	2.043	1.954	1.925	1.906	1.655	1.637	1.554
	C	1.968	1.971	1.973	1.963	1.886	1.676	1.570	1.557
5	A	2.016	2.021	1.965	1.942	1.886	1.755	1.689	1.667
	B	2.023	2.023	2.020	2.005	1.901	1.717	1.600	1.559
	C	2.013	2.019	2.005	1.973	1.864	1.736	1.658	1.637
6	A	1.964	1.972	1.941	1.941	1.809	1.729	1.669	1.604
	B	1.875	1.883	1.881	1.854	1.813	1.623	1.580	1.542
	C	2.025	2.003	1.995	1.947	1.815	1.622	1.591	1.550
7	A	1.917	1.920	1.917	1.917	1.865	1.655	1.566	1.442
	B	1.864	1.868	1.865	1.808	1.761	1.644	1.530	1.450
	C	2.040	2.030	2.001	1.996	1.948	1.689	1.656	1.522
8	A	1.893	1.888	1.821	1.804	1.717	1.521	1.346	1.244
	B	1.804	1.804	1.799	1.798	1.686	1.513	1.371	1.336
	C	1.813	1.813	1.805	1.796	1.682	1.459	1.445	1.325
9	A	1.934	1.879	1.878	1.825	1.732	1.599	1.500	1.406
	B	1.899	1.896	1.883	1.864	1.693	1.457	1.365	1.360
	C	2.025	2.009	2.000	1.943	1.802	1.650	1.535	1.453
10	A	1.918	1.914	1.911	1.909	1.807	1.638	1.558	1.360
	B	1.918	1.906	1.904	1.813	1.759	1.647	1.547	1.482
	C	1.942	1.923	1.922	1.862	1.823	1.642	1.599	1.562
11	A	1.979	1.983	1.984	1.918	1.828	1.709	1.601	1.560
	B	1.919	1.920	1.917	1.875	1.744	1.635	1.594	1.486
	C	1.932	1.932	1.923	1.922	1.810	1.646	1.566	1.518
12	A	2.036	2.042	1.975	1.969	1.872	1.698	1.600	1.584
	B	2.015	2.002	1.985	1.910	1.807	1.691	1.588	1.533
	C	1.977	1.976	1.975	1.977	1.820	1.736	1.650	1.587
13	A	1.940	1.945	1.934	1.932	1.857	1.677	1.570	1.525
	B	1.901	1.875	1.874	1.876	1.817	1.677	1.566	1.495
	C	1.877	1.905	1.908	1.908	1.800	1.680	1.615	1.596
14	A	1.828	1.832	1.830	1.828	1.702	1.524	1.399	1.339
	B	1.856	1.870	1.863	1.868	1.804	1.638	1.556	1.444
	C	1.890	1.891	1.894	1.897	1.854	1.727	1.662	1.570

(continued)

(continued)

Unit no.	Flat leg on	Dates of measurements							
		1.11. 70	1.1. 71	28.2. 71	4.5. 71	22.6. 71	2.9. 71	11.4. 72	10.7. 72
15	A	1.845	1.847	1.804	1.802	1.655	1.453	1.403	1.316
	B	1.784	1.790	1.785	1.785	1.685	1.507	1.455	1.350
	C	1.825	1.824	1.804	1.802	1.750	1.570	1.476	1.381
16	A	1.800	1.802	1.730	1.728	1.622	1.403	1.362	1.222
	B	1.721	1.736	1.696	1.596	1.536	1.381	1.312	1.277
	C	1.783	1.782	1.763	1.762	1.685	1.566	1.416	1.337
17	A	1.772	1.775	1.766	1.765	1.694	1.545	1.438	1.367
	B	1.892	1.893	1.886	1.853	1.725	1.601	1.468	1.359
	C	1.800	1.800	1.800	1.757	1.688	1.489	1.354	1.293
18	A	2.042	2.040	2.036	2.038	1.947	1.867	1.807	1.789
	B	1.965	1.962	1.955	1.911	1.809	1.654	1.603	1.509
	C	1.902	1.906	1.908	1.909	1.829	1.628	1.564	1.457
19	A	2.097	2.096	2.027	2.027	2.020	1.898	1.855	1.805
	B	2.048	2.051	2.007	2.000	1.898	1.722	1.632	1.616
	C	2.047	2.051	2.048	2.051	1.937	1.768	1.713	1.695
20	A	2.068	2.066	2.069	2.068	2.069	1.950	1.854	1.825
	B	1.966	1.965	1.965	1.959	1.924	1.732	1.591	1.508
	C	2.077	2.076	2.031	2.029	1.813	1.654	1.715	1.608
21	A	1.744	1.746	1.747	1.748	1.656	1.493	1.410	1.399
	B	1.780	1.779	1.771	1.770	1.698	1.526	1.417	1.371
	C	1.958	1.963	1.960	1.943	1.874	1.702	1.569	1.463
22	A	1.604	1.542	1.532	1.526	1.438	1.458	1.330	1.297
	B	1.701	1.700	1.688	1.687	1.543	1.551	1.481	1.484
	C	1.616	1.574	1.562	1.557	1.464	1.692	1.542	1.330
23	A	1.599	1.597	1.568	1.563	1.466	1.442	1.278	1.215
	B	1.550	1.550	1.549	1.549	1.455	1.323	1.272	1.235
	C	1.535	1.534	1.530	1.531	1.430	1.633	1.452	1.299
24	A	2.040	2.046	2.026	2.017	1.943	1.878	1.780	1.654
	B	1.837	1.842	1.837	1.790	1.743	1.617	1.500	1.331
	C	1.879	1.874	1.869	1.864	1.693	1.587	1.470	1.357
25	A	2.097	2.089	2.082	2.073	1.948	1.946	1.779	1.728
	B	1.870	1.871	1.871	1.871	1.836	1.598	1.573	1.468
	C	2.039	2.038	2.035	1.999	1.973	1.806	1.771	1.711
26	A	2.240	2.212	2.200	2.107	2.065	1.998	1.875	1.856
	B	1.990	1.990	1.988	1.990	1.857	1.729	1.678	1.608
	C	2.062	2.060	2.059	2.056	1.970	1.875	1.824	1.711

Platform Profile, Saltwick Bay - General Data

Grid reference: 91501113

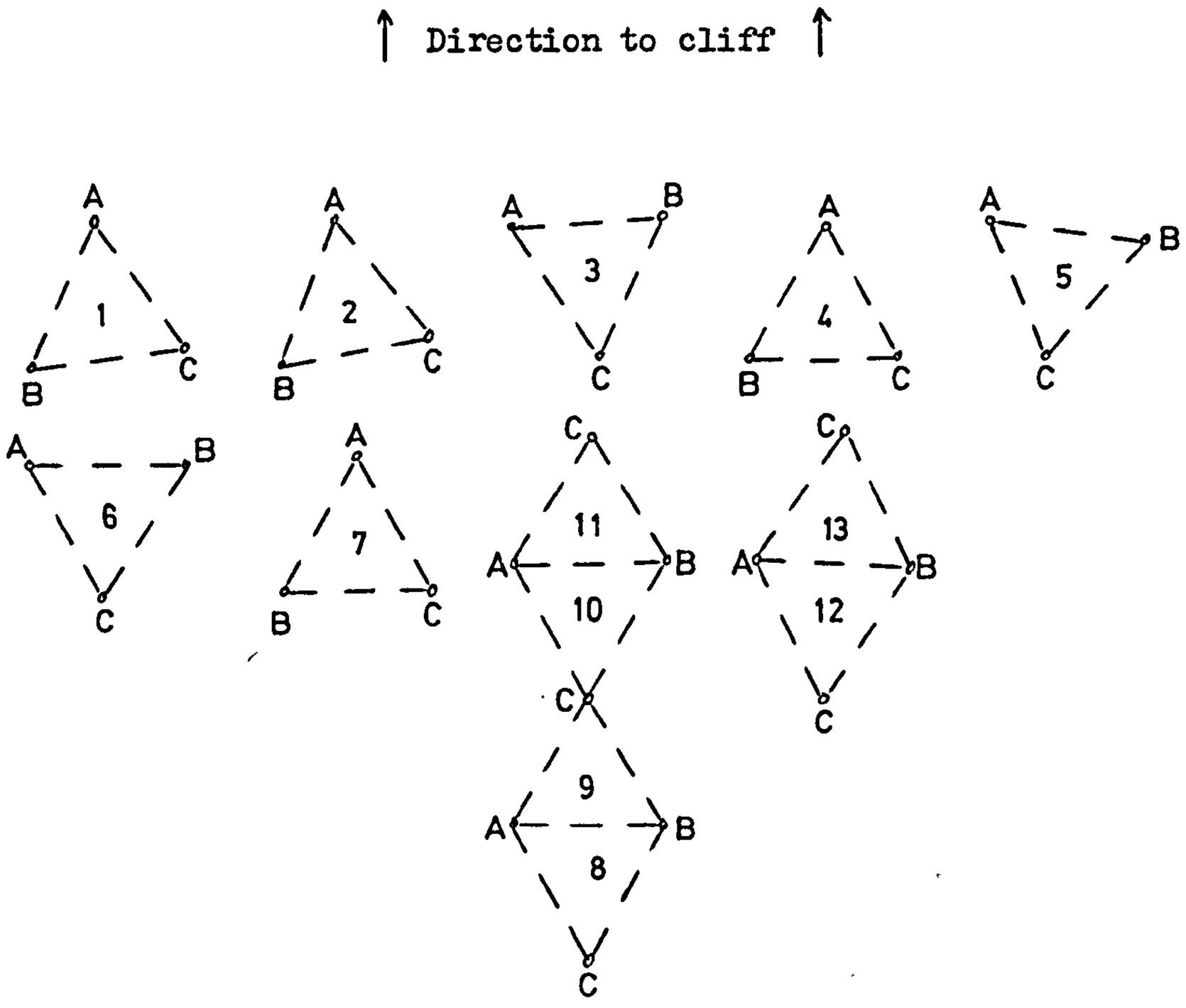
Geology: Bituminous Shales; strata 43 to 47 of Howarth (1962)

Location of units: distance from unit 1 to unit 2 = 97.7 feet
2 to unit 3 = 82 feet
3 to unit 4 = 37 feet
4 to unit 5 = 44 feet
5 to unit 6 = 21.5 feet
6 to unit 7 = 6.5 feet
7 to unit 8 = 6.5 feet
unit 11 to unit 12 = 1 foot
unit 13 to cliff foot = 1 foot

units 14 to 17 are in cliff (unit 17 highest)

See also Figs.5-15a and b

Orientation of M.E.M.:



Platform Profile, Saltwick Bay - M.E.M.' Data

Unit no.	Flat leg on	Dates of measurements							
		9.9. 70	31.10. 70	5.1. 71	28.2. 71	5.5. 71	7.7. 71	6.10. 71	12.4. * 72
1	A	1.120	1.120	1.124	1.123	1.123	1.121	1.120	1.123
	B	1.143	1.149	1.152	1.157	1.162	1.092	1.092	1.095
	C	1.149	1.149	1.143	1.138	1.140	1.148	1.118	1.115
2	A	-	1.347	1.347	1.345	1.346	1.346	1.344	1.345
	B	-	1.332	1.335	1.335	1.333	1.333	1.330	1.332
	C	-	1.357	1.360	1.357	1.354	1.355	1.351	1.350
3	A	2.567	2.567	2.590	2.599	2.605	2.603	2.600	2.607
	B	2.659	2.656	2.666	2.671	2.664	2.666	2.664	2.667
	C	2.657	2.679	2.678	2.682	2.682	2.684	2.682	2.680
4	A	2.452	2.523	2.523	2.537	2.535	2.524	2.396	2.400
	B	2.455	2.485	2.490	2.486	2.516	2.506	2.410	2.413
	C	2.512	2.530	2.556	2.555	2.598	2.551	2.540	2.513
5	A	-	2.521	2.525	2.525	2.525	2.521	2.517	2.505
	B	-	2.521	2.526	2.517	2.516	2.521	2.509	2.500
	C	-	2.507	2.508	2.506	2.404	2.504	2.394	2.391
6	A	-	2.220	2.213	2.212	2.498	2.491	2.490	2.423
	B	-	2.357	2.354	2.360	2.440	2.437	2.435	2.435
	C	-	2.183	2.186	2.182	2.282	2.283	2.288	2.288
7	A	-	2.332	2.329	2.357	2.351	2.346	2.343	2.343
	B	-	2.343	2.340	2.342	2.345	2.341	2.339	2.339
	C	-	2.390	2.415	2.422	2.425	2.423	2.423	2.423
8	A	-	1.675	1.663	1.651	1.655	1.653	1.627	1.608
	B	-	1.950	1.931	1.923	1.920	1.911	1.903	1.902
	C	-	1.950	1.951	1.948	1.954	1.941	1.917	1.903
9	A	1.540	1.450	1.422	1.428	1.418	1.412	1.383	1.372
	B	1.650	1.690	1.686	1.696	1.702	1.696	1.584	1.582
	C	1.523	1.296	1.234	1.240	1.248	1.238	1.213	1.200
10	A	1.785	1.712	1.704	1.700	1.661	1.651	1.626	1.600
	B	1.773	1.726	1.722	1.718	1.722	1.638	1.627	1.623
	C	1.634	1.612	1.594	1.584	1.586	1.390	1.377	1.360
11	A	1.571	1.589	1.584	1.582	1.581	1.574	1.558	1.480
	B	1.701	1.646	1.598	1.590	1.587	1.563	1.507	1.500
	C	1.713	1.615	1.610	1.585	1.573	1.555	1.485	1.480
12	A	2.090	2.070	2.071	2.073	1.975	1.961	1.814	1.690
	B	2.077	1.985	1.980	1.984	1.984	1.968	1.767	1.728
	C	2.007	1.911	1.912	1.922	1.933	1.805	1.704	1.700
13	A	2.142	2.101	2.122	2.124	2.123	1.960	1.792	1.747
	B	2.211	2.195	2.190	2.193	2.199	2.077	1.847	1.685
	C	2.272	2.215	2.223	2.230	2.221	2.140	1.952	1.878
14	A	2.832	2.813	2.775	2.780	2.685			
	B	2.789	2.764	2.806	2.781	2.782			
	C	2.961	2.965	2.972	2.873	2.995			

(continued)

(continued)

Unit no.	Flat leg on	Dates of measurements							
		9.9. 70	31.10. 70	5.1. 71	28.2. 71	5.5. 71	7.7. 71	6.10. 71	12.4. 72*
15	A	2.190	2.150	2.158	2.155				
	B	2.196	2.110	2.116	2.115				
	C	2.256	2.203	2.203	2.210				
16	A	2.150	2.148	2.152	2.148	2.150	2.150	2.139	2.150
	B	2.139	2.143	2.150	2.154	2.153	2.153	2.150	2.151
	C	2.245	2.241	2.250	2.232	2.241	2.238	2.236	2.247
17	A	2.036	1.854	1.810	1.808	1.811	1.660	1.241	1.090
	B	1.994	1.805	1.807	1.803	1.796	1.540	1.199	1.143
	C	1.900	1.696	1.696	1.692	1.612	1.445	1.216	0.923

* Units 12 to 17 measured on 20.4.72

Unit no.	Flat leg on	11.7. 72
1	A	-
	B	-
	C	-
2	A	1.347
	B	1.349
	C	1.364
3	A	2.522
	B	2.667
	C	2.694
4	A	2.395
	B	2.353
	C	2.507
5	A	2.480
	B	2.495
	C	2.388
6	A	2.415
	B	2.429
	C	2.289
7	A	2.343
	B	2.343
	C	2.422
8	A	-
	B	-
	C	-

Unit no.	Flat leg on	11.7. 72
9	A	1.378
	B	1.583
	C	1.112
10	A	1.483
	B	1.468
	C	1.320
11	A	1.471
	B	1.432
	C	1.435
12	A	1.653
	B	1.574
	C	1.586
13	A	1.621
	B	1.686
	C	1.723
16	A	2.166
	B	2.150
	C	2.244
17	A	0.980
	B	0.860
	C	0.772

Rail Hole Bight and Jump Down Bight - General Data

Grid reference: 911112

Geology: Bituminous shales (bed 47) to Alum Shales (bed 64)

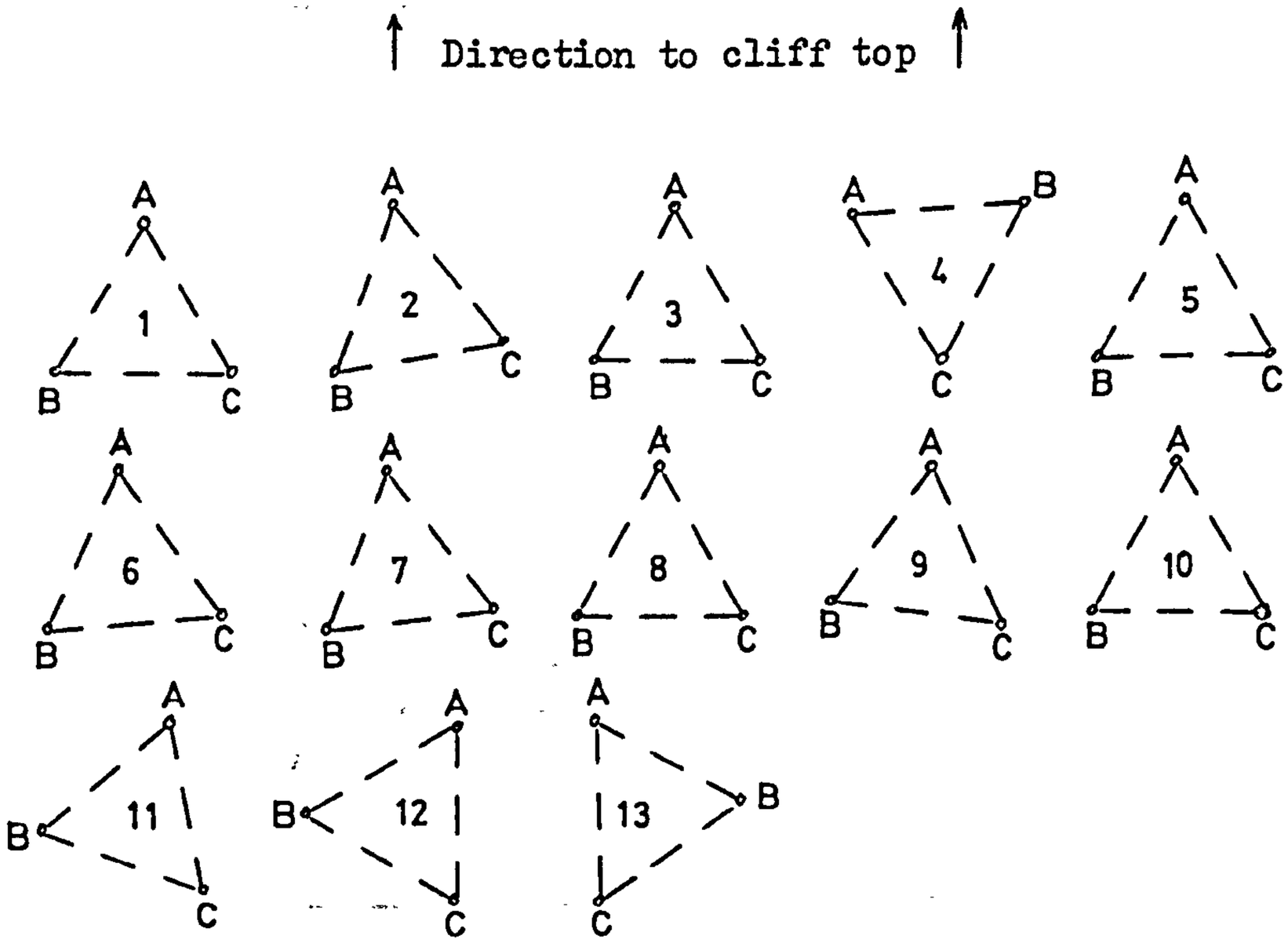
Location of Units: all units are at the foot of the cliff.
unit 1 is at the tip of the headland between Rail Hole and Long Bights
unit 6 is at the tip of the headland between Rail Hole and Jump Down Bights

approximate distance from unit 1 to unit 2 = 120 ft.*
2 to unit 3 = 120 ft.*
3 to unit 4 = 120 ft.*
4 to unit 5 = 120 ft.*
5 to unit 6 = 80 ft.
6 to unit 7 = 120 ft.*
7 to unit 8 = 120 ft.*
8 to unit 9 = 130 ft.
9 to unit 10 = 80 ft.
10 to unit 11 = 56 ft.
11 to unit 12 = 52 ft.*
12 to unit 13 = 120 ft.*

* points near units 1, 2, 3, 4, 5, 7, 8, 12 and 13 are marked with yellow paint

See also Fig. 8.4

Orientation of M.E.M.:



Rail Hole Bight and Jump Down Bight - M.E.M. Data

Unit no.	Flat leg on	Dates of measurements					
		12.1. 71*	20.3. 71	7.7. 71	6.10. 71	11.4. 72	11.7. 72
1	A	2.435	2.264	2.273	2.283	2.289	2.281
	B	2.381	2.373	2.372	2.360	2.322	2.264
	C	2.422	2.187	2.190	2.197	2.199	2.196
2	A	2.476	2.472	1.711	1.717	1.717	1.658
	B	2.408	2.400	2.418	2.152	2.152	2.146
	C	2.125	2.121	2.132	2.143	2.143	1.252
3	A	2.248	2.232	2.215	2.187	1.798	1.800
	B	2.225	2.200	2.176	2.179	1.643	1.728
	C	1.995	1.991	1.988	1.991	1.576	1.571
4	A	2.296	2.280	2.274	2.274	2.274	2.270
	B	2.627	2.627	2.628	2.675	2.675	2.635
	C	2.557	2.566	2.556	2.558	2.558	2.565
5	A	2.390	2.390	2.377	2.379	2.095	2.095
	B	2.416	2.409	2.404	2.406	2.348	2.297
	C	2.525	2.524	2.516	2.431	2.369	2.363
6	A	2.840	2.831	2.834	2.830	2.830	2.823
	B	2.685	2.684	2.689	2.696	2.697	2.697
	C	2.723	2.724	2.722	2.721	2.723	2.722
7	A	2.225	2.225	2.224	2.139	1.578	1.578
	B	2.474	2.370	2.352	2.334	1.312	1.220
	C	2.236	2.245	2.238	2.241	1.927	1.919
8	A	2.876	2.875	2.877	-	-	2.831
	B	3.125	2.988	2.904	-	-	2.855
	C	2.819	2.815	2.799	-	-	2.776
9	A	2.584	2.583	2.581	2.593	2.339	2.330
	B	3.111	3.111	3.049	3.033	2.221	2.218
	C	2.949	2.949	2.947	2.940	2.872	2.376
10	A	3.075	2.417	2.231	2.236	0.548	0.547
	B	2.682	2.157	1.857	1.852	c.-0.4	-
	C	2.766	1.892	1.705	1.693	0.264	0.241
11	A	2.502	2.500	2.501	2.505	2.526	2.533
	B	2.292	2.292	2.293	2.297	2.290	2.295
	C	2.327	2.328	2.328	2.334	2.334	2.333
12	A	1.757	1.754	1.752	1.755	1.756	1.752
	B	1.857	1.853	1.852	1.850	1.846	1.847
	C	1.463	1.461	1.464	1.469	1.466	1.466
13	A	2.261	-	2.258	2.257	2.257	2.257
	B	2.379	-	2.376	2.376	2.376	2.376
	C	2.244	-	2.242	2.241	2.241	2.241

* units 9 to 13 measured on 13.1.71

Fourth Bight, Whitby - General Data

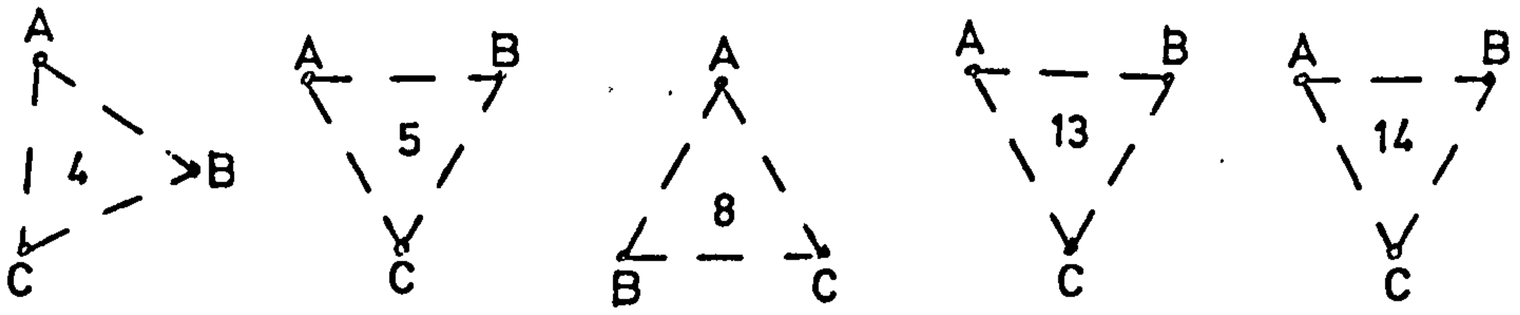
Grid reference: 90271147

Geology: Alum Shales - beds 53 and 55 (Howarth, 1962)

Location of units: all units are at the cliff foot (see Fig.4·16)

Orientation of M.E.M.: only five units remained intact on 10.7.72

↑ Direction to cliff top ↑



Height and Orientation of units:

Unit no.	1	2	3	4	5	6	7
Height (m)	2.00	1.50	2.08	3.11	2.90	2.44	2.01
*Orientation	15	35.5	71	8.5	53	4	1

Unit no.	8	9	10	11	12	13	14
Height (m)	2.25	2.70	2.40	1.53	1.21	1.13	1.98
*Orientation	48	0	83	77	34	78	0

* orientation of normal to unit to direction of wave attack

Notes on M.E.M. Data:

(1) units 12 and 14 measured on 26.11.70

(2) unit 3 measured on 8.1.71 and units 12 and 14 on 6.1.71

(3) units 1, 2, 3 and 9 measured on 16.4.71

(4) unit 8 measured on 15.7.71

(5) unit 8 measured on 26.10.71

(6) units 4, 5 and 6 measured on 10.11.71

(7) units 10 and 14 measured on 14.1.72

Fourth Bight, Whitby - M.E.M. Data

Unit no.	Flat leg on	Dates of measurements							
		27.11.70 (1)	7.1.71 (2)	29.1.71	29.1.71	4.2.71	4.2.71	11.2.71	19.2.71
1	A			1.098		0.851		0.792	0.779
	B			1.115		0.848		0.782	0.775
	C			1.148		0.892		0.850	0.836
2	A			1.412		0.983		0.807	0.750
	B			1.292		0.908		0.789	0.729
	C			0.900		0.723		0.631	0.571
3	A		1.898	1.809		1.742		1.722	1.712
	B		1.927	1.828		1.776		1.768	1.755
	C		1.912	1.835		1.788		1.773	1.753
4	A	1.702	1.435	1.174		0.982		0.973	0.971
	B	1.579	1.487	1.497		1.357		1.352	1.350
	C	2.043	1.942	1.801		1.685		1.676	1.674
5	A	1.824	1.289	1.132		1.027		1.015	1.012
	B	1.557	1.073	0.904		0.856		0.852	0.850
	C	1.876	1.285	1.205		1.058		1.052	1.054
6	A	2.167	1.766	1.751		1.732		1.728	1.710
	B	2.014	1.912	1.873		1.852		1.847	1.768
	C	2.093	2.007	1.984		1.967		1.964	1.954
7	A	1.474	1.152	0.993		0.688		0.596	-
	B	1.916	1.592	1.395		1.222		1.304	1.292
	C	1.525	1.050	0.959		0.811		0.779	0.745
8	A	1.655	1.287	1.000		0.966		0.961	0.958
	B	1.857	1.319	1.163		0.976		0.963	0.956
	C	1.950	1.722	1.645		1.512		1.485	1.468
9	A	1.979	1.953	1.826		1.609		1.606	1.576
	B	1.943	1.907	1.875		1.718		1.714	1.671
	C	1.851	1.767	1.675		1.541		1.541	1.478
10	A	2.132	1.754	1.561		1.398		1.376	1.327
	B	1.671	1.323	1.290		1.244		1.240	1.233
	C	1.510	1.344	1.182		1.028		1.016	0.948
11	A	1.284	1.287	0.093	1.023	0.692		0.658	0.482
	B	1.411	0.570	0.367	1.096	0.882		0.850	0.683
	C	1.214	0.361	0.140	0.980	0.694		0.676	0.585
12	A	2.060	0.971	0.189		0.143	0.693	0.588	0.558
	B	2.007	1.321	1.173		0.616	0.866	0.758	0.726
	C	1.860	0.992	0.570		0.210	0.832	0.685	0.622
14	A	2.083	2.078	2.073		2.073	2.070	2.067	2.067
	B	2.285	2.268	2.272		2.073	2.292	2.292	2.292
	C	2.085	2.072	2.080		2.078	2.140	2.127	2.127

(continued)

(continued)

Unit no.	Flat leg on	Dates of measurements							
		27.2. 71	27.2. 71	13.3. 71	13.3. 71	21.3. 71	27.3. 71	27.3. 71	3.4. 71
1	A	0.605		0.313		0.128	0.065	1.205	1.192
	B	0.649		0.262		0.228	0.198	1.388	1.333
	C	0.646		0.215		0.163	0.142	1.182	1.137
2	A	0.506		-	1.256	1.028	0.939		0.800
	B	0.508		0.030	1.332	1.095	1.010		0.856
	C	0.313		-	1.287	1.083	0.992		0.800
3	A	1.629	1.543			1.477	1.426		1.376
	B	1.674	1.582			1.500	1.460		1.390
	C	1.672	1.596			1.529	1.471		1.409
4	A	0.877	0.836			0.825	0.799		0.681
	B	1.305	1.261			1.240	1.175		0.952
	C	1.614	1.560			1.540	1.415		1.355
5	A	0.912	0.846			0.833	0.805		0.731
	B	0.792	0.760			0.753	0.713		0.415
	C	0.980	0.924			0.909	0.857		0.765
6	A	1.667	1.621			1.606	1.572		1.535
	B	1.727	1.695			1.677	1.657		1.637
	C	1.943	1.910			1.880	1.849		1.819
7	A	0.997		0.909		-	-		0.512
	B	1.670		1.397		1.270	1.045		0.777
	C	1.490		1.424		1.383	1.339		1.187
8	A	0.944		0.911		0.948	0.935		0.895
	B	0.920		0.831		0.969	0.958		0.889
	C	1.395		1.238		1.256	1.235		1.155
9	A	1.367		1.279		1.260	1.072		0.920
	B	1.439		1.365		1.348	1.116		1.008
	C	1.330		1.290		1.284	0.967		0.935
10	A	0.873		0.752		1.911	1.829		1.756
	B	1.103		0.999		1.464	1.391		1.306
	C	0.567		0.385		1.735	1.681		1.653
11	A	-	1.299	1.003		2.038	1.700		1.390
	B	0.193	1.365	1.261		2.047	1.631		1.289
	C	c.0.0	1.386	0.893		1.792	1.543		1.442
12	A	0.551		0.125		2.359	2.326		2.258
	B	0.719		0.435		2.656	2.638		2.608
	C	0.607		0.400		2.510	2.501		2.479
14	A	2.065		2.064		2.065	2.064		2.065
	B	2.290		2.289		2.290	2.288		2.289
	C	2.129		2.127		2.128	2.124		2.145

(continued)

(continued)

Unit no.	Flat leg on	Dates of measurements							
		15.4. 71 (3)	27.4. 71	3.5. 71	3.5. 71	18.5. 71	25.5. 71	2.6. 71	7.6. 71
1	A	1.034	0.639	0.585		0.579	0.503	0.297	0.259
	B	1.100	0.611	0.560		0.554	0.420	0.286	0.232
	C	0.884	0.531	0.375		0.373	0.257	0.039	0.004
2	A	0.416		1.063		0.967	0.749	0.628	0.597
	B	0.476		1.061		0.962	0.778	0.586	0.543
	C	0.451		0.523		0.433	0.353	0.291	0.215
3	A	1.337	1.217	1.141		1.136	1.065	1.025	1.015
	B	1.355	1.237	1.180		1.179	1.123	1.154	1.075
	C	1.372	1.263	1.215		1.210	1.173	1.186	1.143
4	A	0.670	0.539	0.508		0.513	0.483	0.466	0.466
	B	0.885	0.827	0.805		0.807	0.783	0.769	0.770
	C	1.338	1.251	1.235		1.239	1.222	1.214	1.216
5	A	0.709	0.618	0.590		0.592	0.575	0.566	0.567
	B	0.404	0.352	0.324		0.324	0.311	0.307	0.307
	C	0.746	0.689	0.663		0.665	0.602	0.573	0.572
6	A	1.483	1.451	1.440		1.439	1.426	1.415	1.413
	B	1.623	1.525	1.508		1.498	1.482	1.471	1.468
	C	1.813	1.781	1.771		1.762	1.745	1.721	1.691
7	A	0.450	-	-		-	-	-	-
	B	0.702	0.470	0.332		0.316	0.213	0.204	0.208
	C	1.115	0.617	0.545		0.533	0.422	0.410	0.386
8	A	0.861	0.764	0.761	0.724	0.727	0.657	0.632	0.624
	B	0.860	0.750	0.640	1.060	1.060	1.014	1.003	1.001
	C	1.113	0.951	0.905	0.965	0.966	0.907	0.893	0.891
9	A	0.918	0.595	0.537		0.539	0.516	0.514	0.510
	B	1.004	0.745	0.630		0.631	0.596	0.597	0.592
	C	0.931	0.705	0.612		0.610	0.557	0.554	0.542
10	A	1.877	1.393	1.344		1.332	0.447	0.446	0.430
	B	1.383	0.957	0.921		0.917	0.888	0.889	0.883
	C	1.720	1.545	1.422		1.415	1.311	1.308	1.294
11	A	1.222	0.383						
	B	0.928	0.330						
	C	1.258	0.532						
12	A	2.216	2.032	1.859		1.593	1.780	1.601	1.564
	B	2.428	1.619	1.704		1.664	1.860	1.747	1.669
	C	2.584	1.699	1.689		1.650	1.935	1.832	1.778
13	A							0.760	0.773
	B							0.790	0.784
	C							0.590	0.586
14	A	2.062	2.061	2.061		2.060	2.061	2.054	2.048
	B	2.288	2.288	2.286		2.287	2.287	2.286	2.283
	C	2.150	2.136	2.127		2.127	2.141	2.149	2.115

(continued)

(continued)

Unit no.	Flat leg on	Dates of measurements							
		14.6. 71	14.6. 71	21.6. 71	28.6. 71	28.6. 71	6.7. 71	12.7. 71	19.7. 71 (4)
1	A	1.770		1.544	1.456		1.457	1.443	1.158
	B	1.631		1.351	1.303		1.298	1.283	1.075
	C	1.201		1.018	0.921		0.917	0.874	0.595
2	A	0.244	1.720	1.399	1.344		1.319	1.295	0.927
	B	0.254	1.611	1.423	1.361		1.343	1.324	1.016
	C	-	1.660	1.451	1.389		1.356	1.286	0.942
3	A	0.946		0.896	0.882		1.002	1.002	0.952
	B	0.985		0.927	0.909		0.964	0.962	0.899
	C	1.033		0.990	0.974		1.019	1.018	0.938
4	A	0.433		0.426	0.422		0.485	0.491	0.460
	B	0.746		0.741	0.735		0.865	0.865	0.848
	C	1.189		1.173	1.168		1.236	1.241	1.203
5	A	0.546		0.541	0.540		0.540	0.540	0.511
	B	0.288		0.279	0.277		0.275	0.276	0.247
	C	0.536		0.519	0.515		0.514	0.514	0.468
6	A	1.310		1.289	1.272		1.270	1.235	1.140
	B	1.430		1.387	1.369		1.367	1.360	1.328
	C	1.624		1.602	1.590		1.583	1.576	1.542
7	A	-		-	-	0.724	0.721	0.692	0.657
	B	0.075		0	-	1.243	1.239	1.213	1.047
	C	0.209		0.143	0.089	1.413	1.405	1.376	1.203
8	A	0.575		0.557	0.547		0.544	0.542	0.727
	B	0.855		0.831	0.827		0.816	0.819	1.389
	C	0.767		0.752	0.747		0.744	0.746	0.974
9	A	0.171		0.140	0.119		0.115	0.107	0.031
	B	0.300		0.271	0.242		0.241	0.226	0.159
	C	0.406		0.385	0.338		0.337	0.324	0.278
10	A	0.257		0.105	0.104		1.206	1.209	1.192
	B	0.832		0.811	0.810		1.989	1.989	1.962
	C	1.140		1.096	1.093		2.357	2.354	2.285
12	A	1.547		1.545	1.544		1.543	1.544	1.541
	B	1.655		1.654	1.656		1.654	1.656	1.645
	C	1.765		1.764	1.765		1.763	1.761	1.762
13	A	0.775		0.778	0.778		0.782	0.781	0.781
	B	0.784		0.786	0.786		0.787	0.786	0.786
	C	0.578		0.578	0.576		0.576	0.576	0.576
14	A	2.046		2.047	2.047		2.047	2.045	2.046
	B	2.281		2.283	2.283		2.285	2.283	2.284
	C	2.112		2.113	2.111		2.114	2.113	2.113

(continued)

(Continued)

Unit no.	Flat leg on	Dates of measurements							
		19.7. 71	4.8. 71	10.8. 71	10.8. 71	16.8. 71	1.9. 71	7.9. 71	13.9. 71
1	A		1.025	0.995		0.972	0.687	0.678	0.632
	B		0.980	0.962		0.925	0.815	0.790	0.720
	C		0.448	0.430		0.383	0.164	0.154	0.141
2	A		0.677	0.649		0.543	0.228	0.162	0.034
	B		0.784	0.750		0.637	0.386	0.360	0.253
	C		0.704	0.648		0.581	0.282	0.244	0.131
3	A		0.904	0.882		0.866	0.750	0.749	0.751
	B		0.859	0.841		0.796	0.711	0.700	0.700
	C		0.886	0.876		0.847	0.782	0.783	0.778
4	A		0.476	0.484		0.785	0.692	0.707	0.708
	B		0.849	0.853		0.942	0.922	0.930	0.930
	C		1.188	1.188		1.352	1.223	1.234	1.240
5	A		0.495	0.492		0.488	0.446	0.452	0.450
	B		0.238	0.235		0.233	0.220	0.221	0.220
	C		0.453	0.446		0.443	0.420	0.420	0.421
6	A		1.104	1.016		0.988	1.641	1.620	1.599
	B		1.292	1.070		1.059	1.244	1.240	1.220
	C		1.505	1.480		1.411	1.631	1.610	1.579
7	A		0.597	0.578		0.570	0.491	0.487	0.460
	B		0.956	0.931		0.907	0.758	0.748	0.712
	C		1.105	1.086		1.065	0.924	0.910	0.864
8	A		0.695	0.694		0.690	0.650	0.650	0.642
	B		1.356	1.351		1.332	1.186	1.182	1.132
	C		0.945	0.945		0.930	0.865	0.868	0.859
9	A	1.743	1.703	1.689		1.662	1.656	1.592	1.578
	B	2.089	2.040	1.985		1.822	1.816	1.638	1.618
	C	1.800	1.772	1.760		1.723	1.721	1.436	1.429
10	A		1.174	1.171	1.316	1.308	1.262	1.257	1.249
	B		1.949	1.051	1.279	1.259	1.138	1.104	1.016
	C		2.258	0.542	1.085	1.063	0.948	0.953	0.946
12	A		1.530	1.532		1.423	1.337	1.338	1.242
	B		1.630	1.629		1.587	1.528	1.528	1.381
	C		1.758	1.755		1.676	1.617	1.618	1.488
13	A		0.782	0.781		0.776	0.690	0.702	0.663
	B		0.786	0.786		0.786	0.780	0.779	0.768
	C		0.575	0.575		0.562	0.557	0.556	0.545
14	A		2.047	2.046		2.046	2.038	2.042	2.039
	B		2.282	2.281		2.279	2.278	2.278	2.277
	C		2.115	2.113		2.113	2.110	2.111	2.111

(continued)

(continued)

Unit no.	Flat leg on	Dates of measurements							
		20.9. 71	5.10. 71	5.10. 71	13.10. 71	19.10. 71	25.10. 71 (5)	25.10. 71	2.11. 71
1	A	0.629	1.477		1.348	1.272	1.074		1.064
	B	0.725	1.108		0.952	0.894	0.715		0.699
	C	0.138	0.928		0.919	0.916	0.567		0.554
2	A	0.020	1.619		1.410	1.317	1.155		1.060
	B	0.221	1.772		1.654	1.602	1.419		1.374
	C	0.115	1.622		1.448	1.380	1.200		1.154
3	A	0.745	0.560		0.523	0.523	0.375		0.370
	B	0.700	0.464		0.396	0.395	0.329		0.326
	C	0.774	0.550		0.517	0.515	0.420		0.417
4	A	0.710	0.218		0.205	0.208	0.107		0.108
	B	0.930	0.838		0.818	0.818	0.560		0.562
	C	1.233	0.917		0.896	0.894	0.278		0.282
5	A	0.451	0.309	1.212	1.196	1.196	1.134		1.135
	B	0.219	0.136	1.095	1.081	1.081	1.046		1.046
	C	0.420	0.351	1.129	1.118	1.116	0.972		0.969
6	A	1.591	1.353		1.333	1.316	1.580		1.578
	B	1.215	1.150		1.119	1.116	1.690		1.685
	C	1.575	1.444		1.349	1.149	1.832		1.831
7	A	0.479	1.022		0.920	0.916	0.835		0.831
	B	0.675	1.670		1.685	1.686	1.537		1.538
	C	0.837	1.326		0.720	0.725	0.621		0.631
8	A	0.640	1.637		1.607	1.600	1.687		1.687
	B	1.129	1.762		1.740	1.696	1.750		1.749
	C	0.858	1.728		1.697	1.695	1.573		1.579
9	A	1.571	1.499		1.456	1.448	0.616		0.607
	B	1.609	1.505		1.473	1.434	0.900		0.881
	C	1.422	1.379		1.305	1.300	0.797		0.792
10	A	1.249	0.943		0.708	0.690	0	1.393	1.393
	B	1.031	0.796		0.534	0.519	0.495	1.922	1.921
	C	0.946	0.894		0.827	0.813	0.196	1.502	1.583
12	A	1.211	1.166		1.164	1.149	1.150		1.141
	B	1.366	1.347		1.347	1.344	1.343		1.342
	C	1.475	1.431		1.427	1.402	1.400		1.392
13	A	0.672	0.665		0.662	0.664	0.668		0.657
	B	0.767	0.755		0.759	0.756	0.757		0.756
	C	0.539	0.527		0.527	0.524	0.524		0.523
14	A	2.039	2.040		2.039	2.043	2.037		2.036
	B	2.277	2.275		2.276	2.274	2.273		2.273
	C	2.111	2.113		2.112	2.110	2.109		2.113

(continued)

(continued)

Unit no.	Flat leg on	Dates of measurements								
		9.11. 71 (6)	16.11. 71	1.12. 71	8.12. 71	21.12. 71	4.1. 72	10.1. 72 (7)	12.4. 72	10.7. 72
2	A	0.678	0.313							
	B	1.094	0.903							
	C	0.636	0.401							
3	A	0.261	0.238							
	B	0.195	0.166							
	C	0.187	0.125							
4	A	1.426	1.410	1.138	1.084	1.077	1.038	1.036	1.034	0.979
	B	1.828	1.819	1.066	1.003	0.990	0.957	0.955	0.922	0.770
	C	1.668	1.659	1.242	1.217	1.212	1.182	1.179	1.169	0.930
5	A	1.596	1.592	1.198	1.107	1.075	1.026	1.022	-	-
	B	1.515	1.504	1.130	1.088	1.071	0.901	0.902	0.664	0.440
	C	1.352	1.340	1.142	1.116	1.108	0.998	0.997	0.696	0.322
6	A	1.855	1.862	1.582	1.569	1.235	0.934	0.921		
	B	1.578	1.571	1.400	1.381	1.350	0.182	0.180		
	C	1.775	1.777	1.679	1.680	1.671	1.299	1.268		
8	A	1.612	1.603	1.426	1.400	1.375	1.275	1.256	1.221	0.146
	B	1.689	1.681	1.536	1.507	1.483	1.395	1.376	1.326	0.461
	C	1.450	1.441	1.332	1.306	1.275	1.164	1.164	1.135	0.126
9	A		1.444	1.121	0.978	0.958	0.892	0.891	0.369	
	B		1.994	1.759	1.030	0.993	0.841	0.830	0.452	
	C		1.755	1.520	1.487	1.479	1.455	1.454	0.476	
10	A	1.205	1.192	1.085	0.923	0.832	0.646	0.622	-	
	B	1.149	1.135	0.621	0.571	0.520	0.396	0.380	-	
	C	1.233	1.213	0.921	0.857	0.819	0.738	0.713	0.024	
12	A	1.138	1.056	0.936	0.935	0.920	0.538	0.481		
	B	1.341	1.323	1.186	1.185	1.156	0.894	0.890		
	C	1.386	1.343	1.215	1.212	1.192	0.901	0.881		
13	A	0.662	0.654	0.641	0.643	0.634	0.529	0.494	0.475	0.470
	B	0.755	0.754	0.739	0.738	0.737	0.688	0.646	0.614	0.590
	C	0.523	0.514	0.468	0.469	0.463	0.392	0.359	0.343	0.329
14	A	2.035	2.035	2.035	2.034	2.033	2.033	2.026	1.946	1.831
	B	2.267	2.064	2.255	2.260	2.259	2.250	2.239	2.146	2.085
	C	2.110	2.111	2.114	2.107	2.106	2.095	2.068	1.887	1.778

Fourth Bight, Whitby - Beach Data

Unit no.	Stud	27.11.70	7.1.71	29.1.71	4.2.71	11.2.71	19.2.71	27.2.71	27.2.71	13.3.71	21.3.71	27.3.71
	A			0	-1	12	-3	0		0	16	-4
1	B			0	-1	12	-3	0		0	16	-4
	C			-5	-6	7	-8	-5		-5	11	-9
	A			3	2	-1	-1	2		-3	4	0
2	B			-2	-3	-6	-6	-3		-8	-1	-5
	C			-2	-3	-6	-6	-3		-8	-1	-5
	A		-	-2	11	8	-6	-5		-3	14	2
3	B		-	-7	6	3	-11	-10		-8	9	-3
	C		-	-7	6	3	-11	-10		-8	9	-3
	A	-	-	0	13	13	12	1		21	26	5
4	B	-	-	-4	9	9	8	-3		17	22	0
	C	-	-	-4	9	9	8	-3		17	22	1
	A	-	-	6	15	14	11	-1		12	16	14
5	B	-	-	2	11	10	7	-5		8	13	10
	C	-	-	0	9	8	5	-7		6	12	8
	A	-	-	0	10	6	7	1		1	18	3
6	B	-	-	0	10	6	7	1		-2	18	3
	C	0	-	-6	4	0	1	-5		-5	12	-3
	A	-	-	5	5	3	2	7		0	11	11
7	B	-	-	-1	-1	-3	-4	7		0	11	11
	C	-	-	-2	-1	-3	-4	1		-6	5	5
	A	-	-	7	8	8	13	12		6	18	15
8	B	-	-	7	8	8	13	12		6	18	15
	C	-	-	1	2	2	7	6		0	13	9
	A	-	-	-16	-15	-3	-4	-10		-7	4	-12
9	B	-	-	-16	-15	-3	-4	-10		-7	4	-12
	C	-	-	-10	-21	-9	-10	-16		-13	-2	-18
	A	-	-	3	4	-11	5	13		5	11	4
10	B	-	-	-1	0	-15	-1	9		-1	7	0
	C	0	-	-3	-2	-17	1	7		-1	5	-2
	A	6	0	-10	-13	-7	-9	-4	0	-9	0	-4
11	B	0	-6	-16	-19	-13	-15	-10	0	-9	0	-4
	C	0	-6	-16	-19	-13	-15	-10	-6	-15	-6	-10
	A	-	-	-10	-2	7	2	13		0	0	11
12	B	-	-	-4	-8	1	-4	7		0	-4	7
	C	-	-	-4	-8	1	-4	7		6	-4	7

(continued)

(continued)

Unit no.	Stud	3.4.71	15.4.71	27.4.71	3.5.71	18.5.71	25.5.71	2.6.71	7.6.71	14.6.71	14.6.71	21.6.71
	A	-6	10	2	-7	-17	3	-6	-1	2		-7
1	B	-6	10	2	-7	-17	3	-6	-1	2		-7
	C	-11	6	-3	-11	-22	-2	-12	-7	-3		-12
	A	-2	2	2	-2	-5	1	0	2	1	2	-1
2	B	-7	-3	2	-2	-3	3	1	2	2	-3	-6
	C	-7	-3	-4	-6	-9	-3	-4	-4	-4	-3	-6
	A	-1	2	-1	-2	-2	-2	0	2	-1		-6
3	B	-6	-3	-7	-7	-7	-8	-5	-3	-5		-10
	C	-6	-3	-7	-7	-7	-8	-5	-3	-5		-12
	A	12	0	3	18	20	8	5	17	5		5
4	B	8	-4	-2	14	16	3	0	13	0		1
	C	8	-6	-4	12	16	3	-1	11	-1		-1
	A	16	6	9	16	16	12	10	16	10		9
5	B	12	2	6	12	13	8	6	12	8		6
	C	10	0	3	10	12	6	4	11	5		4
	A	11	0	6	14	14	1	3	10	7		3
6	B	11	-2	6	14	14	-1	3	8	6		3
	C	5	-6	0	8	8	-6	-3	3	1		-2
	A	2	3	7	4	3	3	-4	5	7		7
7	B	2	3	7	4	3	3	-4	5	7		7
	C	-4	-3	1	-2	-3	-3	-10	0	1		1
	A	10	9	12	14	14	3	0	10	12		10
8	B	10	9	12	14	8	-1	-6	5	7		5
	C	4	3	8	8	8	-2	-6	4	6		4
	A	-2	-11	6	4	3	-24	-23	6	-8		3
9	B	-2	-11	6	4	3	-24	-23	6	-8		3
	C	-8	-17	0	-2	-3	-30	-29	1	-14		-2
	A	3	6	12	7	11	-6	-8	11	7		16
10	B	-1	3	7	2	6	-12	-12	8	4		10
	C	-3	0	8	4	6	-9	-15	5	2		10
	A	-13	-4	4								
11	B	-13	-4	4								
	C	-19	-10	-2								
	A	-5	8	10	6	6	-4	-6	7	8		22
12	B	-9	4	6	0	0	-9	-12	2	10		17
	C	-9	4	6	0	0	-9	-12	4	13		19
	A							-4	2	12		23
13	B							-2	3	14		23
	C							-10	-2	8		17

(continued)

(continued)

Unit no.	Stud	28.6.71	28.6.71	6.7.71	12.7.71	19.7.71	19.7.71	4.8.71	10.8.71	10.8.71	16.8.71	1.9.71
1	A	10		-3	2	-3		-2	14		-3	-2
	B	12		-4	2	-2		-1	14		-3	-2
	C	16		-10	-3	-7		-6	9		-7	-6
2	A	9		6	11	2		19	1		-1	4
	B	4		0	6	-3		13	-4		-5	-1
	C	3		1	6	-2		15	-3		-5	-2
3	A	11		10	10	3		12	10		0	-2
	B	7		5	6	-1		9	5		-5	-6
	C	6		5	6	-1		7	5		-5	-6
4	A	26		26	28	24		14	25		29	13
	B	18		22	22	19		10	18		25	9
	C	20		20	22	19		20	19		23	9
5	A	16		16	16	16		16	16		16	14
	B	13		12	12	12		12	12		13	11
	C	10		11	11	10		10	11		12	9
6	A	11		6	12	13		12	9		10	4
	B	10		6	11	12		12	9		9	3
	C	5		0	6	8		7	4		5	-2
7	A	-	12	8	8	6		1	11		0	5
	B	-	10	8	8	6		1	11		1	5
	C	5	5	2	3	0		-4	5		-5	0
8	A	15		16	11	16	11	12	18		10	13
	B	11		11	7	11	6	7	14		5	8
	C	11		11	5	11	6	7	13		5	9
9	A	16		14	10	9		10	10		3	-1
	B	16		14	10	9		9	11		4	-1
	C	10		9	5	4		5	6		-2	-5
10	A	18		17	14	12		12	21	15	5	-12
	B	12		12	9	7		6	15	17	7	-12
	C	14		15	10	9		8	17	12	1	-7
12	A	24		22	15	15		14	24		9	23
	B	18		18	11	10		10	20		4	19
	C	20		20	12	12		12	22		6	21
13	A	22		18	12	12		11	23		3	18
	B	22		18	14	13		12	24		4	18
	C	16		12	8	8		7	18		-1	13

(continued)

(continued)

Unit no.	Stud	7.9.71	13.9.71	20.9.71	5.10.71	13.10.71	19.10.71	25.10.71	2.11.71	9.11.71	16.11.71	1.12.71
1	A	10	2	10	-3	6	10	5	17			
	B	11	1	10	-2	6	9	5	17			
	C	6	-3	6	-7	1	5	0	12			
2	A	0	-3	-3	4	-2	-1	7	4	1	-3	
	B	-5	-8	-8	-1	-6	-6	2	-1	-3	-6	
	C	-4	-7	-6	0	-6	-6	3	0	-2	-5	
3	A	9	4	4	-2	11	8	3	12	4	4	
	B	6	0	0	-6	6	4	10	7	0	0	
	C	6	0	0	-7	6	4	10	6	0	-1	
4	A	20	24	8	-2	22	33	25	24	11	24	5
	B	14	19	5	-6	18	27	22	21	6	19	1
	C	15	18	4	-8	16	27	20	18	7	18	0
5	A	16	16	5	3	15	15	14	16	9	10	4
	B	12	12	2	0	12	12	12	13	11	12	6
	C	11	11	0	-3	10	10	11	11	5	6	1
6	A	8	11	0	-1	12	9	13	10	5	-2	-5
	B	9	11	0	-2	12	9	8	5	5	-3	-6
	C	4	6	-5	-7	7	4	8	5	0	-8	-10
7	A	8	6	4	5	9	3	9	6			
	B	8	6	4	0	4	-2	5	1			
	C	3	1	1	0	4	-1	4	0			
8	A	13	0	10	9	13	10	12	12	6	10	4
	B	8	-5	6	4	8	4	6	7	4	5	-1
	C	9	-5	5	3	7	4	6	6	3	5	-1
9	A	10	-7	4	-12	2	2	2	5		-10	-18
	B	10	-7	3	-12	1	2	2	4		-11	-18
	C	5	-12	-1	-17	-3	-3	-3	0		-15	-23
10	A	15	0	11	-3	12	10	9	12	-3	9	-5
	B	18	0	13	0	9	12	11	15	0	12	-3
	C	12	-5	8	-6	6	7	6	10	-6	6	-8
12	A	16	-1	12	14	11	12	13	11	7	14	13
	B	12	-5	7	9	6	7	9	6	3	9	9
	C	14	-3	9	12	8	9	12	8	4	11	11
13	A	13	-5	6	11	6	6	11	6	4	10	10
	B	14	-3	8	12	8	8	12	8	6	12	12
	C	9	-9	2	7	2	3	6	2	0	6	6

(continued)

(continued)

Unit no.	Stud	8.12.71	21.12.71	4.1.72	10.1.72	12.4.72	10.7.72
4	A	24	0	25	25	15	12
	B	21	-3	21	21	12	8
	C	19	-5	19	19	10	7
5	A	10	1	10	10	10	2
	B	12	3	14	14	14	4
	C	6	-2	6	6	6	-1
6	A	-	-4	0	2		
	B	-	-4	0	2		
	C	-	-8	-5	-3		
8	A	15	6	3	7	11	6
	B	9	1	-2	2	6	2
	C	9	1	-2	2	6	1
9	A	6	-14	-11	-6	10	
	B	6	-14	-11	-6	10	
	C	1	-20	-16	-11	5	
10	A	12	-4	-5	4	-	
	B	16	-1	-3	7	-	
	C	10	-7	-8	1	8	
12	A	16	19	-9	-6		
	B	11	15	-11	-5		
	C	13	17	-12	-7		
13	A	12	18	-9	-3	-4	5
	B	14	18	-8	-6	-2	6
	C	8	13	-14	-12	-8	2
14	A				12	3	-
	B				13	3	-
	C				9	-2	-

Ramp Profile in Fourth Bight - General Data

Grid reference: 90271147

Geology: Alum Shales - bed 53 (Howarth 1962)

Location of units: See Fig.4·16

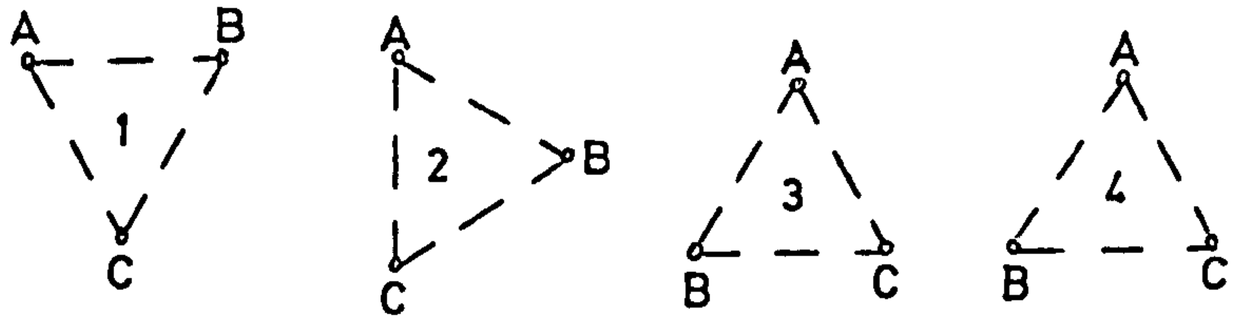
distance from unit 1 to unit 2 = 7.5m

2 to unit 3 = 6.5m

3 to unit 4 = 6.7m

Orientation of M.E.M.:

↑ Direction to cliff ↑



Ramp Profile in Fourth Bight - M.E.M. Data

Unit no.	Flat leg on	Dates of measurements							
		6.7. 71	12.7. 71	19.7. 71	4.8. 71	10.8. 71	16.8. 71	1.9. 71	7.9. 71
1	A	1.696	1.575	1.554	1.554	1.556	1.508	1.497	1.496
	B	1.514	1.513	1.511	1.509	1.478	1.463	1.449	1.449
	C	1.426	1.418	1.398	1.401	1.398	1.368	1.368	1.362
2	A	2.183	2.181	2.165	2.159	2.158	2.152	2.142	2.140
	B	1.810	1.811	1.790	1.783	1.781	1.772	1.764	1.762
	C	1.852	1.846	1.831	1.814	1.823	1.811	1.799	1.797
3	A	1.799	1.796	1.666	1.583	1.573	1.566	1.561	1.534
	B	1.747	1.747	1.600	1.512	1.504	1.493	1.487	1.445
	C	1.792	1.787	1.635	1.544	1.535	1.529	1.526	1.487
4	A	1.935	1.890	1.824	1.787	1.780	1.748	1.736	1.700
	B	1.855	1.836	1.806	1.778	1.770	1.732	1.719	1.666
	C	1.868	1.843	1.822	1.790	1.777	1.738	1.721	1.633

		13.9. 71	20.9. 71	5.10. 71	13.10. 71	20.10. 71	25.10. 71	2.11. 71	9.11. 71
1	A	1.486	1.483	1.466	1.471	1.465	1.465	1.464	1.458
	B	1.444	1.440	1.421	1.418	1.412	1.405	1.396	1.377
	C	1.356	1.353	1.341	1.333	1.282	1.282	1.283	1.272
2	A	2.128	2.139	2.131	2.129	2.129	2.123	2.122	2.086
	B	1.755	1.759	1.743	1.744	1.745	1.743	1.742	1.731
	C	1.790	1.793	1.782	1.781	1.780	1.774	1.774	1.755
3	A	1.531	1.530	1.526	1.526	1.527	1.519	1.517	1.480
	B	1.443	1.441	1.435	1.434	1.434	1.426	1.424	1.388
	C	1.485	1.484	1.483	1.484	1.482	1.473	1.470	1.440
4	A	1.678	1.673	1.665	1.662	1.656	1.624	1.619	1.601
	B	1.643	1.631	1.626	1.624	1.620	1.592	1.586	1.538
	C	1.627	1.616	1.608	1.604	1.602	1.596	1.593	1.583

		16.11. 71	1.12. 71	8.12. 71	21.12. 71	4.1. 72	14.1. 72	12.4. 72	10.7. 72
1	A	1.453	1.386	1.385	1.379	-	-	-	-
	B	1.367	1.347	1.347	1.337	-	-	-	-
	C	1.266	1.254	1.253	1.247	-	-	-	-
2	A	2.084	2.041	2.033	2.030	2.020	-	-	-
	B	1.735	1.710	1.699	1.698	1.683	-	-	-
	C	1.749	1.671	1.661	1.662	1.657	-	-	-
3	A	1.478	1.475	1.468	1.467	1.452	1.451	-	1.426
	B	1.387	1.385	1.376	1.375	1.357	1.357	-	1.332
	C	1.441	1.437	1.419	1.417	1.404	1.403	-	1.378
4	A	1.596	1.593	1.590	1.589	1.584	1.583	1.345	-
	B	1.532	1.531	1.528	1.525	1.524	1.523	1.326	-
	C	1.579	1.577	1.573	1.572	1.567	1.566	1.406	-

Ramp profile in Fourth Bight - Beach data

Depth of M.E.M. units below beach surface (inches)

Date	1	2	3	4
6.7.71	bare	9	3	0.5
12.7.71	bare	12	4	2
19.7.71	bare	9	4	bare
4.8.71	bare	12	5	bare
10.8.71	bare	8	bare	bare
16.8.71	bare	13	6	3
1.9.71	bare	8	bare	0.5
7.9.71	bare	8.5	3	bare
13.9.71	6	15.5	7.5	8.5
20.9.71	4	15	6	2
5.10.71	bare	10	4	6.5
13.10.71	1.5	10	0.5	bare
20.10.71	bare	13.5	6.5	7.5
25.10.71	bare	8	bare	1.5
2.11.71	1	18.5	7	1.5
9.11.71	bare	13.5	2	9
16.11.71	bare	14	3.5	2
1.12.71	bare	8	4	10.5
8.12.71	bare	7.5	bare	bare
21.12.71	bare	7.5	2.5	10
4.1.72	-	20.5	14	11
14.1.72	-	-	8	2.5
12.4.72	-	-	-	2
10.7.72	-	-	10	-

Whitby Harbour - General Data

Grid reference: 90141143

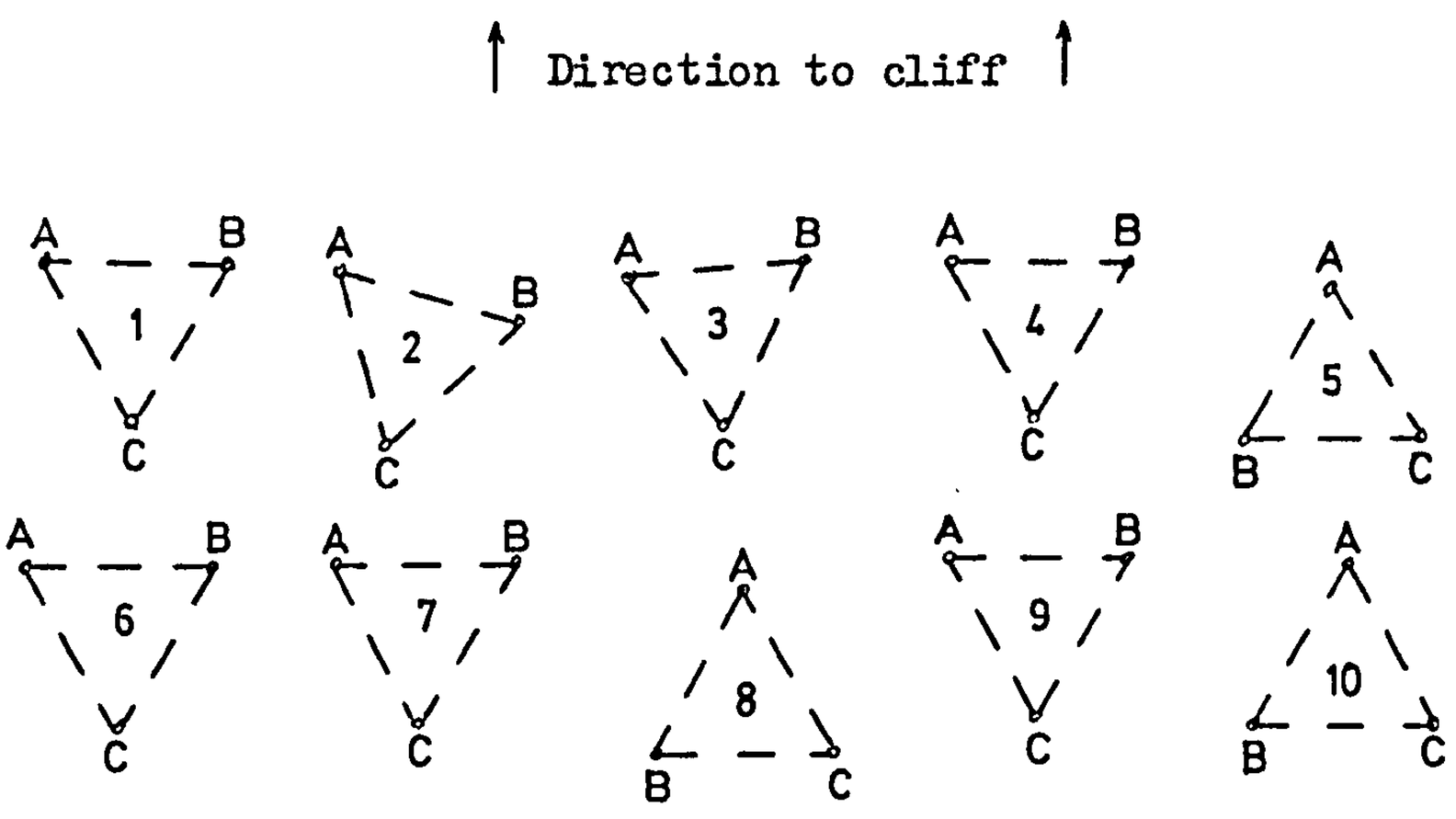
Geology: Alum Shales; strata 53 to 63 of Howarth (1962)

Location of units: unit 1 is at the seaward edge of the rock platform.

Distance from unit 1 to unit 2 = 20.1 ft.
2 to unit 3 = 16.9 ft.
3 to unit 4 = 62 ft.
4 to unit 5 = 25.6 ft.
5 to unit 6 = 20.9 ft.
6 to unit 7 = 26.9 ft.*
7 to unit 8 = 25.5 ft.*
8 to unit 9 = 25 ft.*
9 to unit 10 = 12.5 ft.*
10 to unit 11 = 4.8 ft.

units 11 to 14 are at the base of the cliff (14 highest)
units 7, 8, 9 and 10 are usually under beach.

Orientation of M.E.M.:



Whitby Harbour - M.E.M. Data

Unit no.	Flat leg on	Dates of measurements									
		9.9. 70*	26.11. 70	26.11. 70	6.1. 71	16.4. 71	6.5. 71	8.7. 71	15.7. 71	12.4. 72	11.7. 72
1	A	1.456	1.281		-	1.279	1.276	1.268	-	1.231	1.106
	B	0.850	0.856		-	0.846	0.843	0.839	-	0.833	0.828
	C	1.366	1.367		-	1.356	1.346	1.341	-	1.286	1.254
2	A		2.142		-	2.075	2.067	2.064	-	-	-
	B		2.052		-	2.043	2.037	2.035	-	-	-
	C		1.950		-	1.960	1.952	1.951	-	-	-
3	A	1.066	1.076		-	1.037	1.041	1.085	-	-	-
	B	1.034	1.043		-	1.070	1.076	1.015	-	-	-
	C	1.214	1.212		-	1.211	1.212	1.204	-	-	-
4	A	1.880	1.890		1.886	1.884	1.882	1.876	-	1.821	-
	B	1.804	1.807		1.807	1.799	1.799	1.794	-	1.785	-
	C	1.865	1.854		1.855	1.850	1.850	1.847	-	1.731	-
5	A		1.657		1.654	1.655	1.656	1.651	-	1.651	-
	B		1.519		1.519	1.520	1.516	1.515	-	1.515	-
	C		1.584		1.585	1.586	1.587	1.585	-	1.585	-
6	A	2.127	2.131		2.130	2.126	2.123	2.115	-	2.097	-
	B	2.259	2.243		2.238	2.204	2.196	2.186	-	2.096	-
	C	2.239	2.231		2.229	2.195	2.190	2.186	-	2.152	-
7	A	1.725	1.741	1.851	1.846	1.769	1.827	1.808	-	-	-
	B	1.469	1.440	1.522	1.525	1.512	1.504	1.510	-	-	-
	C	1.725	1.700	1.768	1.728	1.708	1.706	1.704	-	-	-
8	A				0.630	0.602	0.602	0.599	-	-	-
	B				0.676	0.650	0.649	0.646	-	-	-
	C				0.638	0.616	0.614	0.614	-	-	-
9	A				1.048	0.953	0.952	0.952	-	-	-
	B				0.927	0.846	0.843	0.842	-	-	-
	C				0.916	0.895	0.895	0.892	-	-	-
10	A				1.466	1.435	1.423	1.414	-	1.246	-
	B				1.297	1.277	1.187	1.182	-	1.026	-
	C				1.091	1.065	1.051	1.046	-	0.932	-
11	A	2.397	2.040	2.827	2.733	2.724	2.674	2.611	-	1.923	1.898
	B	2.381	2.170	2.933	2.924	2.917	2.811	2.778	-	2.065	1.784
	C	2.458	1.950	2.738	2.670	2.622	2.604	2.575	-	1.835	1.833
12	A		2.364		2.354	2.353	2.347	2.284	-	1.698	1.681
	B		2.005		1.999	1.991	1.981	1.880	-	1.492	1.491
	C		2.283		2.277	2.273	2.271	2.199	-	1.712	1.699
13	A	1.831	0.579		0.572	0.566	0.566	0.553	1.125		
	B	1.848	0.512		0.450	0.449	0.351	0.358	0.895		
	C	1.407	1.009		0.995	0.988	0.993	0.725	0.808		
14	A	2.157	1.618		1.629	1.593	1.588	1.598	1.730		
	B	2.730	1.196		1.201	1.194	1.183	1.145	1.641		
	C	2.094	1.310		0.833	0.825	0.823	0.812	1.263		

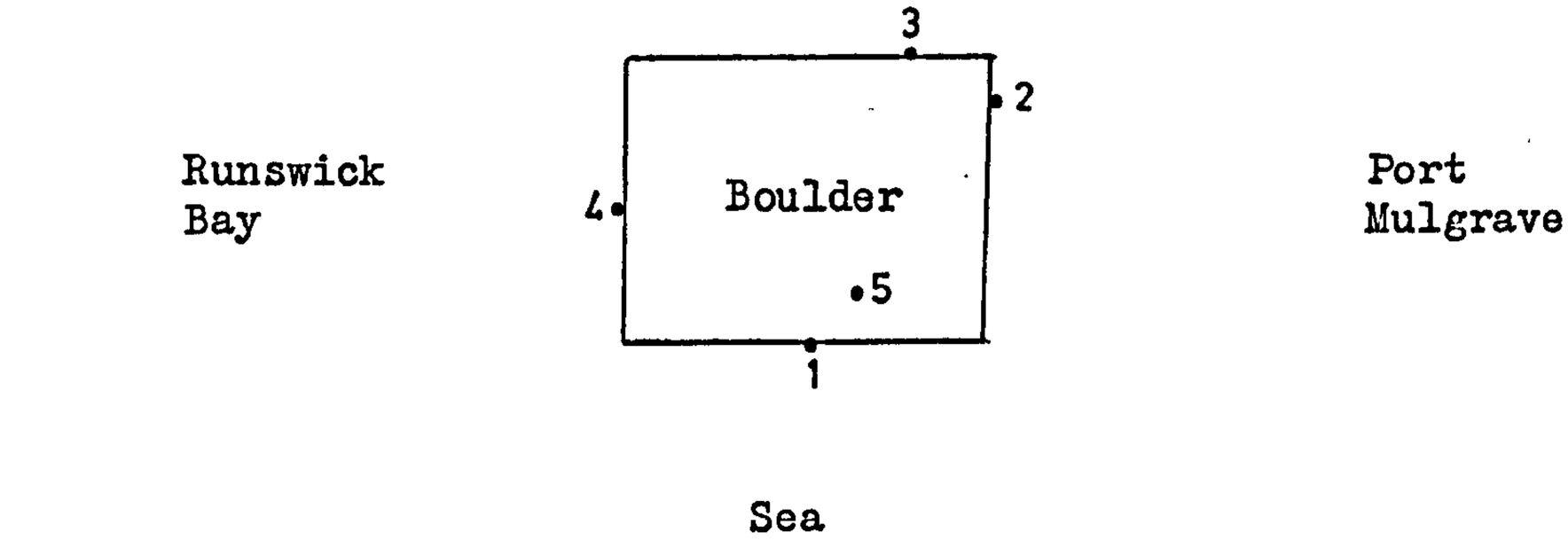
* Unit 1 measured on 14.11.70

Very Large Boulder, Lingrow - General Data

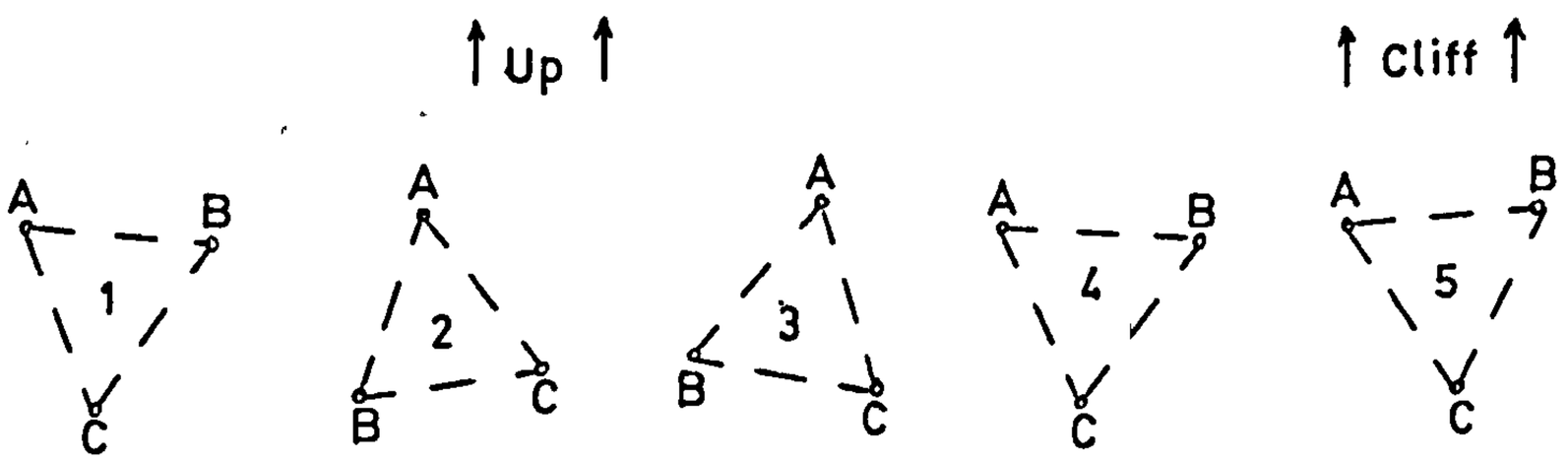
Grid reference: 80841710

Geology: Lower Deltaic Sandstone

Location of units: boulder is easily recognisable as being the seaward of the two largest ones at Lingrow.



Orientation of units:



M.E.M. Data

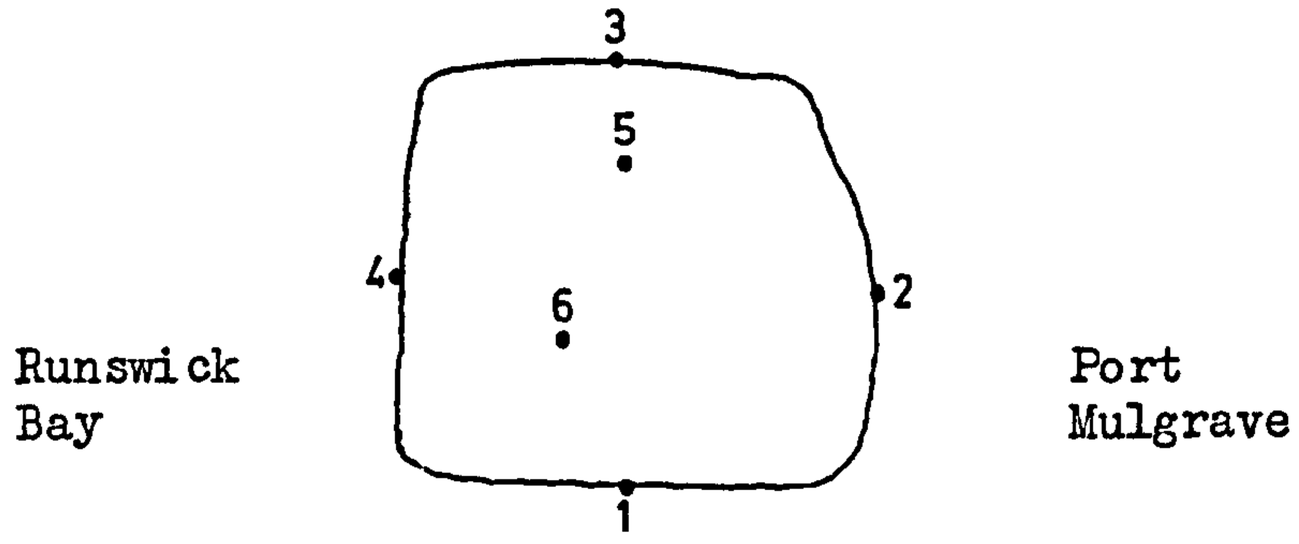
Unit no.	Flat leg on	Dates of measurements					
		7.11. 70	30.12. 70	28.3. 71	6.7. 71	7.10. 71	18.4. 72
1	A	0.789	0.788	0.786	0.787	0.786	0.790
	B	0.785	0.783	0.783	0.782	0.777	0.778
	C	0.744	0.741	0.737	0.739	0.741	0.745
2	A	1.003	1.003	0.998	0.999	0.995	0.993
	B	0.890	0.877	0.875	0.875	0.875	0.877
	C	1.287	1.286	1.283	1.275	1.273	1.272
3	A	1.599	1.599	1.595	1.578	1.586	1.570
	B	1.245	1.233	1.230	1.241	1.238	1.230
	C	1.381	1.379	1.378	1.378	1.374	1.368
4	A	1.506	1.506	1.505	1.503	1.496	1.497
	B	1.986	1.985	1.983	1.984	1.978	1.975
	C	1.503	1.499	1.494	1.492	1.499	1.496
5	A	1.000	1.000	0.997	0.997	0.996	0.995
	B	1.027	1.027	1.025	1.019	1.016	1.012
	C	0.985	0.986	0.978	0.974	0.973	0.972

Boulder on Tall Perch, Lingrow - General Data

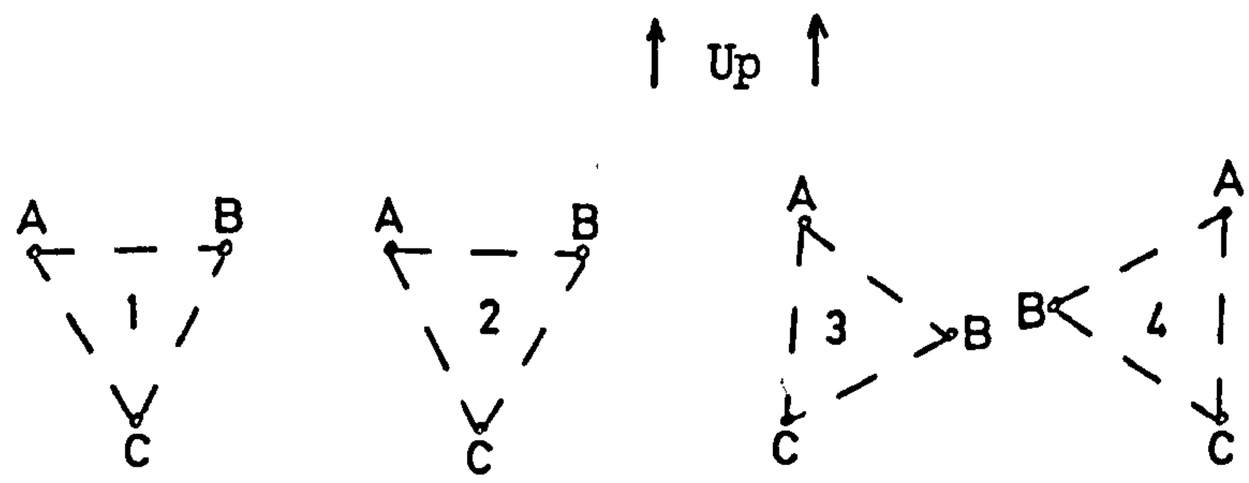
Grid reference: 80841710

Geology: Lower Deltaic Sandstone

Location of units: boulder is on the tall perch marked A in Fig.6·5



Orientation of M.E.M.:



Boulder on Tall Perch, Lingrow - M.E.M. Data

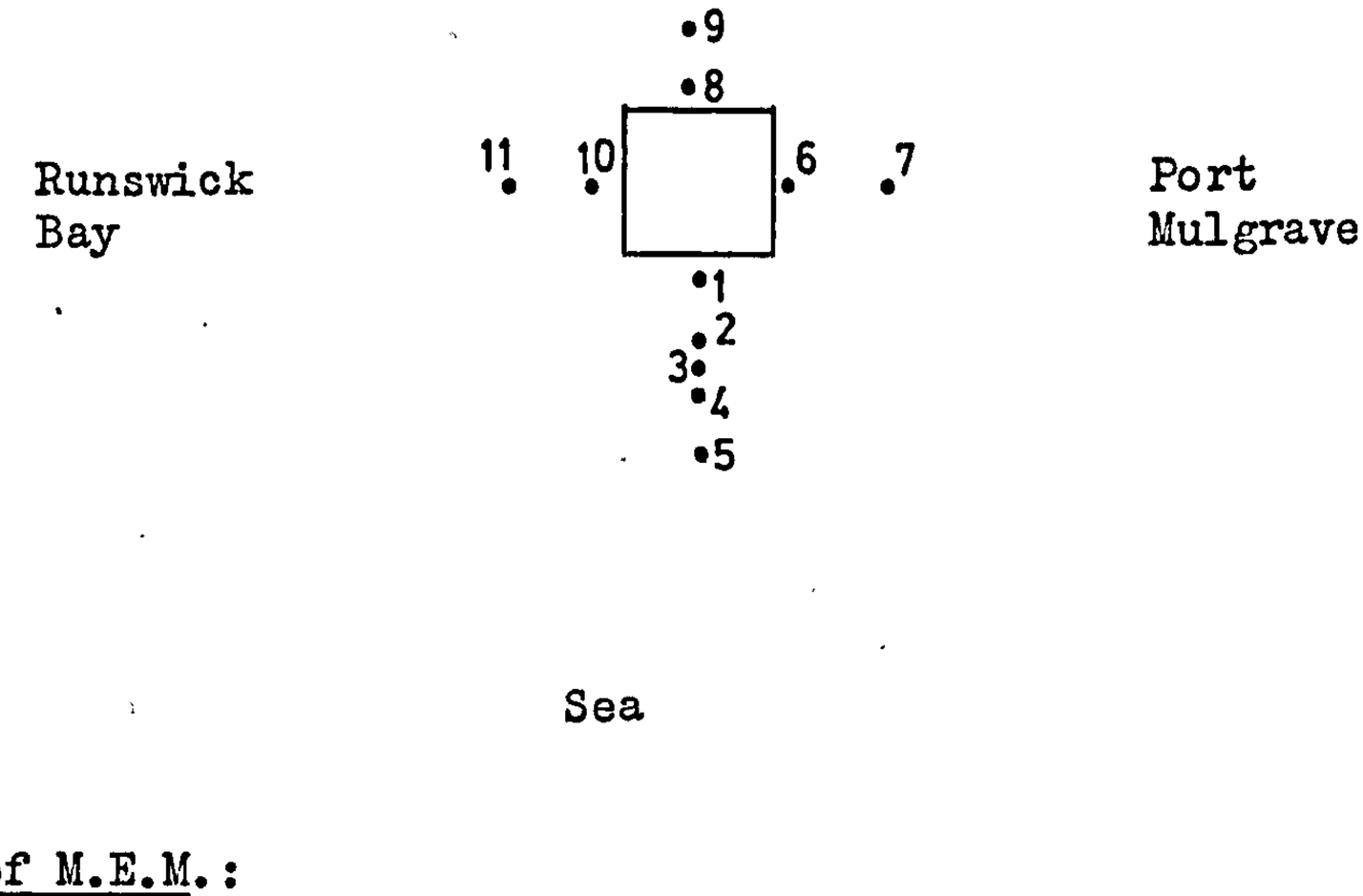
Unit no.	Flat leg on	Dates of measurements					
		7.11. 70	30.12. 70	28.3. 71	6.7. 71	7.10. 71	18.4. 72
1	A	1.585	1.562	1.561	1.559	1.551	1.548
	B	1.968	1.964	1.962	1.961	1.962	1.962
	C	1.011	1.008	1.005	1.000	1.002	1.004
2	A	1.407	1.408	1.405	1.418	1.406	1.408
	B	1.652	1.651	1.650	1.650	1.648	1.648
	C	1.286	1.287	1.286	1.289	1.288	1.286
3	A	1.195	1.197	1.196	1.195	1.195	1.193
	B	0.740	0.735	0.738	0.738	0.734	0.733
	C	0.937	0.934	0.933	0.925	0.934	0.927
4	A	1.329	1.328	1.326	1.325	1.325	1.324
	B	1.295	1.294	1.293	1.289	1.287	1.287
	C	1.259	1.262	1.261	1.260	1.260	1.258
5	A	1.406	1.407	1.405	1.403	1.397	1.398
	B	1.631	1.634	1.633	1.631	1.631	1.625
	C	1.359	1.359	1.357	1.355	1.346	1.348
6	A	0.773	0.772	0.764	0.773	0.770	0.767
	B	0.559	0.560	0.559	0.559	0.557	0.558
	C	1.169	1.163	1.160	1.161	1.160	1.160

Small Perch, Lingrow - General Data

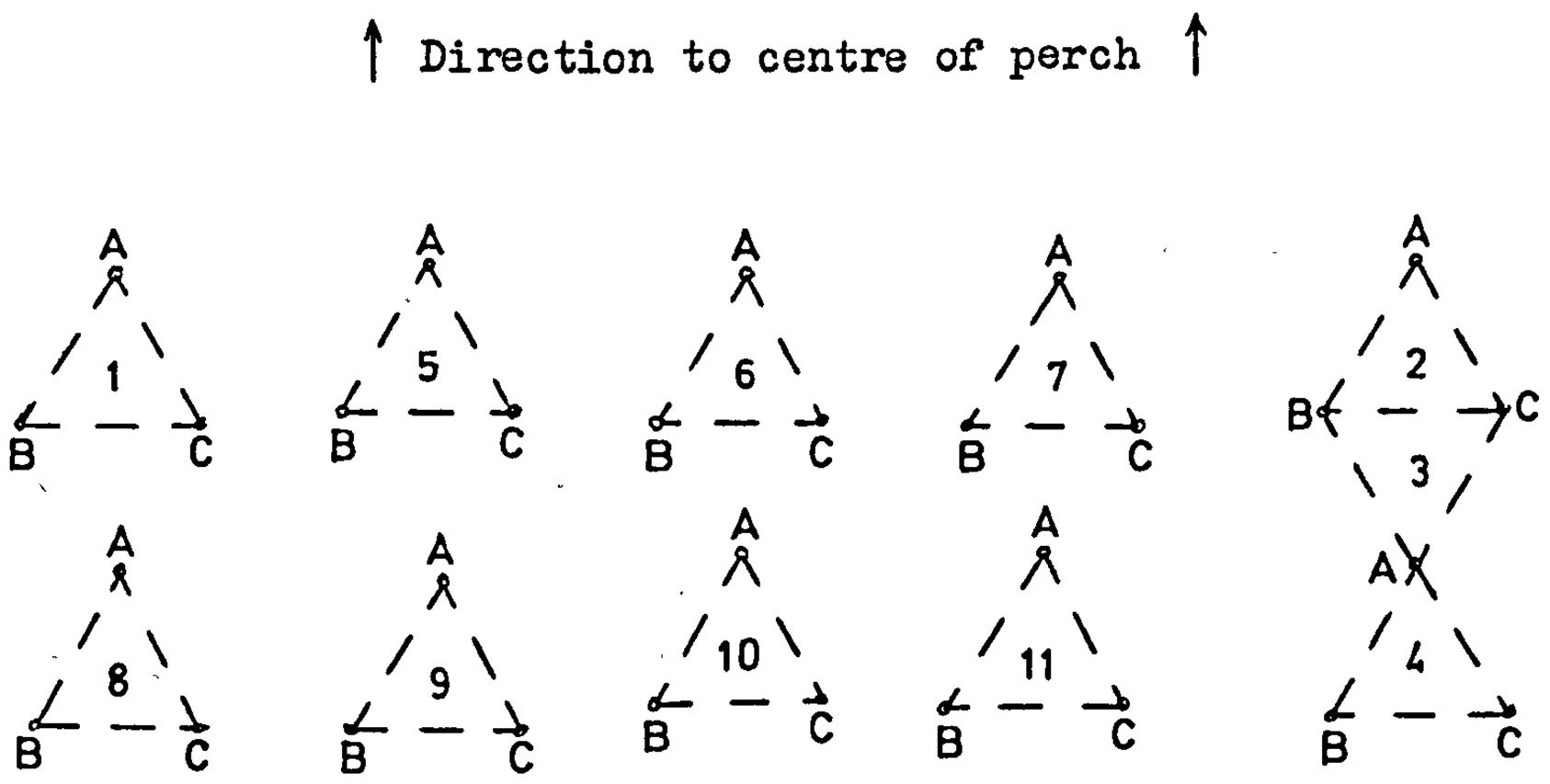
Grid reference: 80841710

Geology: Grey Shales

Location of units: small perch is about 42 ft. landward of two huge boulders



Orientation of M.E.M.:



Small Perch, Lingrow - M.E.M. Data

Unit no.	Flat leg on	Dates of measurements						
		8.11. 70*	30.12. 70	28.4. 71	6.7. 71	7.10. 71	'18.4. 72	12.7. 72
1	A	2.246	2.244	2.246	2.245	2.240	2.230	2.235
	B	1.883	1.882	1.880	1.880	1.880	1.877	1.870
	C	1.940	1.939	1.936	1.935	1.935	1.932	1.931
2	A	2.607	2.605	2.600	2.604	2.602	2.599	2.599
	B	2.442	2.444	2.443	2.443	2.446	2.447	2.470
	C	2.378	2.381	2.378	2.376	2.379	2.376	2.387
3	A	2.060	2.063	2.066	1.976	1.978	1.978	1.981
	B	2.237	2.239	2.238	2.237	2.237	2.238	2.240
	C	2.186	2.185	2.183	2.225	2.183	2.183	2.184
4	A	2.080	2.084	2.080	2.080	2.077	2.079	2.044
	B	2.178	2.180	2.174	2.174	2.181	2.178	2.177
	C	2.026	2.028	2.027	2.031	2.027	2.028	2.031
5	A	2.286	2.290	2.287	2.285	2.286	2.286	-
	B	2.260	2.262	2.264	2.264	2.267	2.267	-
	C	2.193	2.193	2.194	2.190	2.192	2.192	-
6	A	1.300	1.305	1.305	1.306	1.302	1.301	1.301
	B	1.191	1.196	1.193	1.192	1.193	1.191	1.191
	C	1.332	1.339	1.341	1.336	1.340	1.338	1.335
7	A	2.536	2.543	2.542	2.549	2.554	2.428	2.291
	B	2.259	2.268	2.266	2.267	2.266	2.266	2.263
	C	2.390	2.392	2.392	2.392	2.390	2.391	2.377
8	A	1.637	1.637	1.635	1.634	1.635	1.640	1.627
	B	1.605	1.609	1.611	1.614	1.611	1.617	1.592
	C	1.596	1.597	1.596	1.591	1.587	1.588	1.585
9	A	2.203	2.195	2.194	2.191	2.189	2.187	2.186
	B	2.250	2.253	2.255	2.253	2.253	2.250	2.251
	C	2.245	2.249	2.253	2.253	2.253	2.253	2.251
10	A	-	1.413	1.407	1.407	1.388	1.387	1.384
	B	-	1.259	1.255	1.257	1.250	1.253	1.253
	C	-	1.280	1.278	1.284	1.275	1.275	1.277
11	A	2.205	2.207	2.207	2.207	2.223	2.218	2.201
	B	2.184	2.184	2.185	2.187	2.185	2.182	2.180
	C	2.176	2.168	2.178	2.185	2.168	2.166	2.165

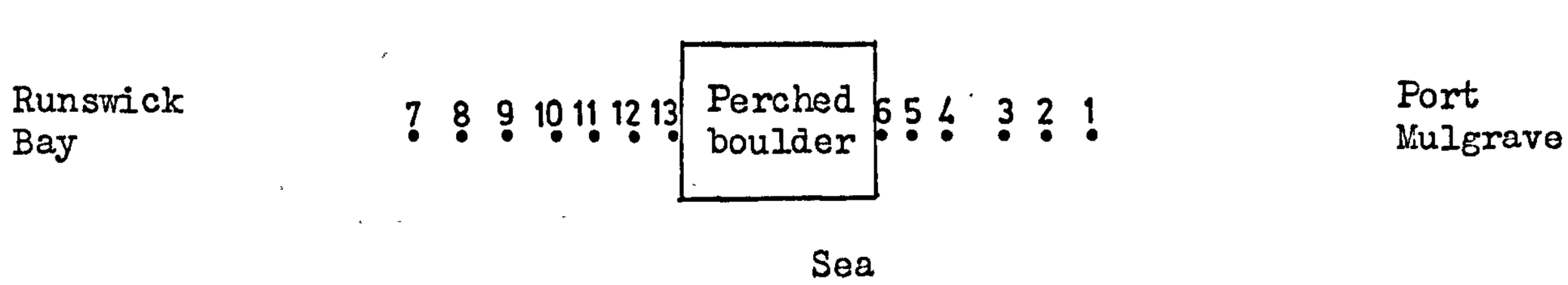
* Units 1 to 4, and 11 measured on 13.11.70

Tall Perch, Lingrow - General Data

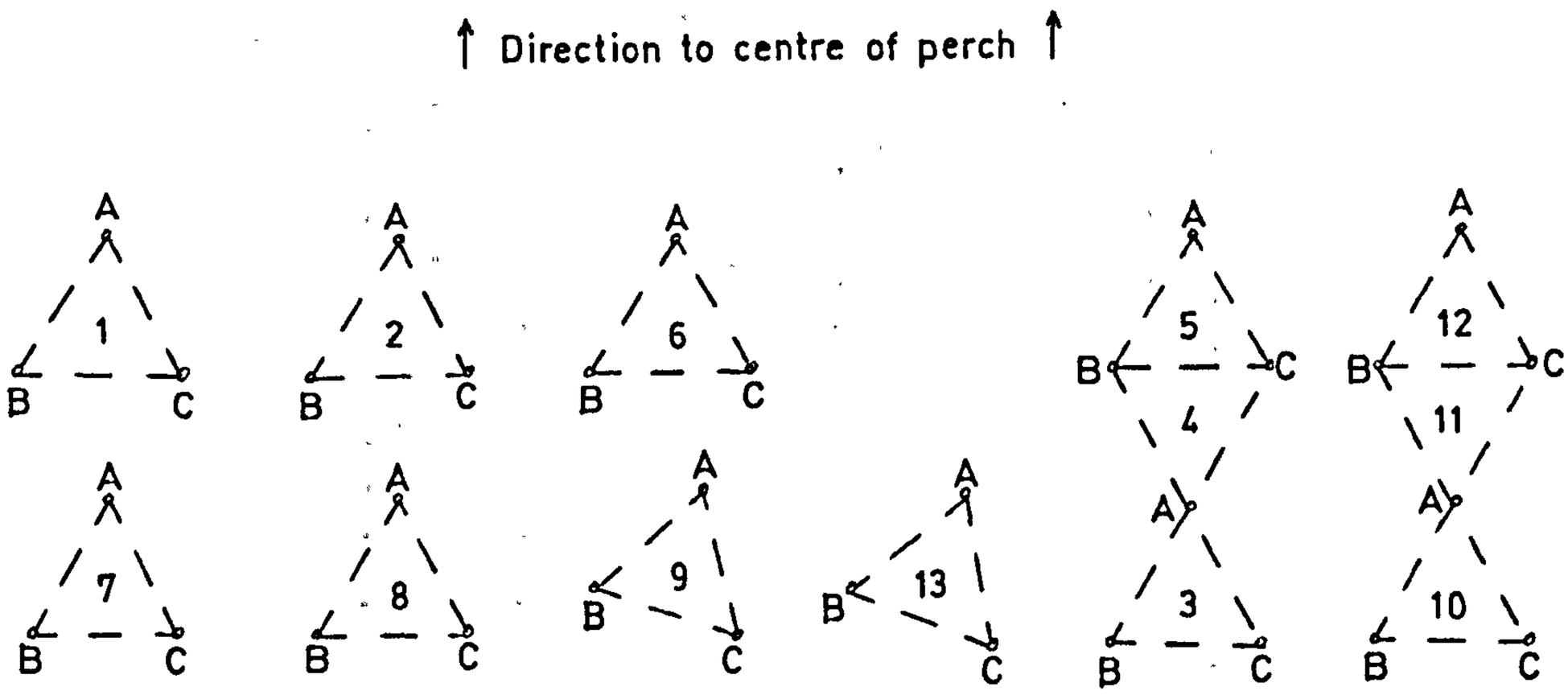
Grid reference : 80841710

Geology: Grey Shales

Location of units: the perch is marked "A" in Fig.6·5



Orientation of M.E.M.:



Tall perch, Lingrow - M.E.M. Data

Unit no.	Flat leg on	Dates of measurements						
		8.11. 70 (1)	30.12. 70	27.4. 71 (2)	6.7. 71	8.10. 71	18.4. 72	12.7. 72
1	A	1.682	1.681	1.676	1.670	1.674	1.681	1.685
	B	1.669	1.668	1.656	1.645	1.643	1.661	1.650
	C	1.662	1.662	1.662	1.660	1.658	1.661	1.660
2	A	1.163	1.159	1.167	1.132	1.133	1.133	1.133
	B	0.976	0.972	0.972	0.975	0.977	0.977	0.883
	C	0.901	0.893	0.890	0.892	0.891	0.891	0.889
3	A	1.746	1.741	1.741	1.738	1.742	1.740	1.709
	B	1.769	1.773	1.770	1.768	1.769	1.761	1.765
	C	1.751	1.753	1.750	1.750	1.746	1.744	1.742
4	A	1.903	1.905	1.903	1.902	1.904	1.901	1.905
	B	1.710	1.710	1.710	1.710	1.717	1.712	1.710
	C	1.949	1.951	1.946	1.946	1.947	1.945	1.955
5	A	2.323	2.331	2.301	2.321	2.325	2.323	2.331
	B	2.086	2.087	2.071	2.073	2.074	2.076	2.077
	C	1.908	1.905	1.915	1.912	1.916	1.903	1.916
6	A	0.767	0.762	0.760	0.758	0.755	0.759	0.758
	B	0.734	0.726	0.729	0.753	0.720	0.700	0.693
	C	0.692	0.700	0.698	0.695	0.698	0.692	0.691
7	A	1.825	1.840	1.838	1.838	1.836	1.827	1.820
	B	1.861	1.878	1.880	1.876	1.874	1.870	1.825
	C	1.952	1.959	1.958	1.954	1.953	1.951	1.950
8	A	2.283	2.273	2.270	2.265	2.262	2.266	2.262
	B	1.955	1.960	1.962	1.961	1.962	1.955	1.945
	C	1.954	1.960	1.960	1.956	1.959	1.957	1.959
9	A	2.028	2.030	2.028	2.050	1.835	1.834	1.612
	B	2.125	2.123	2.125	2.141	1.810	1.816	1.720
	C	2.066	2.064	2.063	2.064	2.062	1.975	1.979
10	A	1.196	1.201	1.197	1.200	1.190	1.197	1.202
	B	1.188	1.184	1.181	1.191	1.171	1.174	1.180
	C	1.164	1.159	1.151	1.161	1.162	1.147	1.155
11	A	1.291	1.291	1.283	1.275	1.267	1.262	1.272
	B	1.555	1.555	1.559	1.562	1.560	1.562	1.563
	C	1.563	1.560	1.564	1.562	1.562	1.565	1.569
12	A	1.896	1.900	1.901	1.899	1.904	1.903	1.875
	B	1.619	1.638	1.612	1.640	1.630	1.640	1.592
	C	1.751	1.750	1.745	1.749	1.747	1.745	1.739
13	A	1.581	1.581	1.576	1.572	1.573	1.576	1.565
	B	1.581	1.579	1.578	1.576	1.573	1.575	1.572
	C	1.604	1.601	1.600	1.598	1.598	1.595	1.594

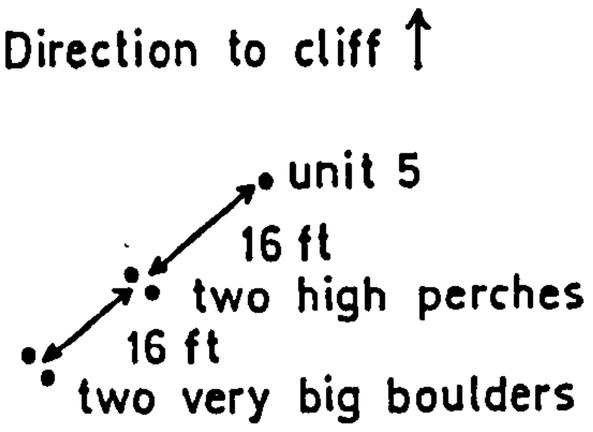
(1) Units 1 to 6 measured on 13.11.70
(2) Unit 6 measured on 28.4.71

Profile East of the Runswick Fault, Lingrow - General Data

Grid reference: 80851705

Geology: Grey Shales

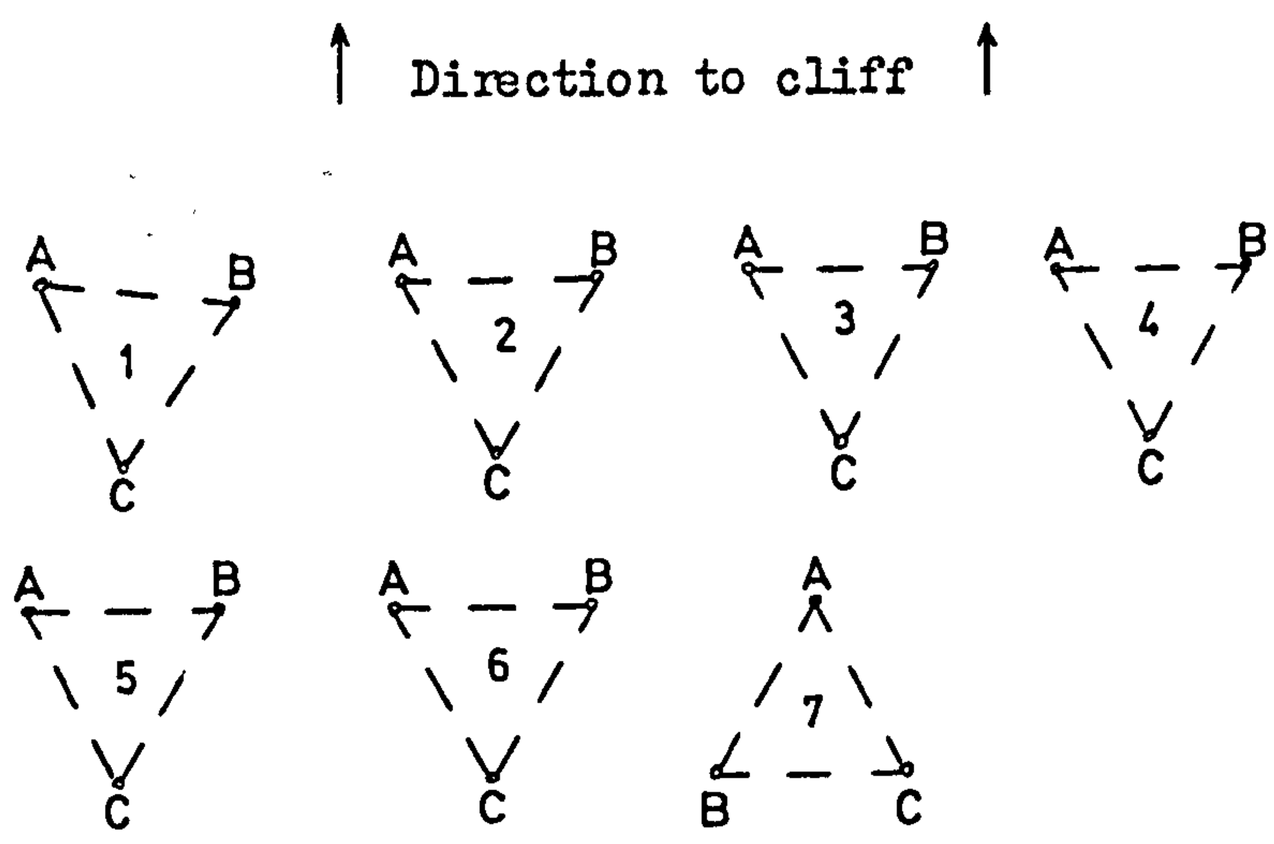
Location of units: unit 5 is the easiest to find first:



Distance from unit 1 to unit 2 = 128.1 ft.
2 to unit 3 = 68.2 ft.
3 to unit 4 = 54.8 ft.
4 to unit 5 = 69.8 ft.
5 to unit 6 = 50.4 ft.
6 to unit 7 = 50.5 ft.

Bearing of profile from true north is 12^{o}.

Orientation of M.E.M.:



Profile East of the Runswick Fault, Lingrow - M.E.M. Data

Unit no.	Flat leg on	Dates of measurements							
		13.11. 70	31.12. 70	28.3. 71	6.5. 71	7.7. 71	7.10. 71	18.4. 72	12.7. 72
1	A	1.393	-	1.400	1.397	1.393	1.394	1.394	-
	B	1.468	-	1.462	1.462	1.460	1.458	1.458	-
	C	1.550	-	1.549	1.549	1.548	1.546	1.546	-
2	A	1.719	1.717	1.715	1.713	-	1.714	-	-
	B	1.657	1.651	1.655	1.648	-	1.646	-	-
	C	1.585	1.685	1.586	1.584	-	1.585	-	-
3	A	1.660	1.658	1.660	1.660	-	1.658	1.660	-
	B	1.790	1.790	1.790	1.790	-	1.789	1.794	-
	C	1.544	1.539	1.540	1.539	-	1.539	1.540	-
4	A	2.070	2.072	2.070	2.069	2.069	2.067	2.067	-
	B	2.088	2.092	2.092	2.090	2.086	2.080	2.080	-
	C	2.070	2.070	2.070	2.065	2.064	2.064	2.064	-
5	A	1.927	1.931	1.932	1.931	1.926	1.923	1.920	-
	B	1.802	1.804	1.803	1.800	1.801	1.800	1.799	-
	C	1.888	1.884	1.880	1.883	1.898	1.910	1.904	-
6	A	2.145	2.146	2.146	2.149	2.149	2.149	2.132	2.096
	B	2.185	2.187	2.183	2.183	2.181	2.180	2.178	2.180
	C	2.156	2.159	2.153	2.155	2.154	2.132	2.129	2.130
7	A	1.798	1.798	1.798	1.799	1.798	1.797	1.796	1.797
	B	1.743	1.743	1.744	1.745	1.744	1.743	1.750	1.744
	C	1.832	1.819	1.818	1.820	1.826	1.817	1.815	1.814

Profile West of Runswick Fault, Lingrow - General Data

Grid reference: 80801705

Geology: units 1 to 4 - Jet Rock Series
units 5 to 17 - Bituminous Shales

Location of units: distance from unit 1 to unit 2 = 37.6 ft.
2 to unit 3 = 10 ft.
3 to unit 4 = 21.1 ft. (unit 4 on Top Jet Dogger)
4 to unit 5 = 70.3 ft.
5 to unit 6 = 59.8 ft.
6 to unit 7 = 67.5 ft.
7 to unit 8 = 57.3 ft.
8 to unit 9 = 20.8 ft.
9 to unit 10 = 20.2 ft.
10 to unit 11 = 14.6 ft.
11 to unit 12 = 11.7 ft.*
12 to unit 13 = 8.3 ft.*
13 to unit 14 = 5.2 ft.*
unit 14 to unit 17 = in cliff (17 highest)

*units 12, 13 and 14 usually under pebble beach

See Figs.5·15c and 6·4

Orientation of M.E.M.:

Profile West of Runswick Fault, Lingrow - M.E.M. Data

Unit no.	Flat leg on	Dates of measurements							
		13.11.70 (1)	31.12.70 (2)	28.3.71	6.5.71	7.7.71	7.10.71	18.4.72	12.7.72
1	A	1.557	1.560	1.556	1.558	1.560	1.559	1.560	1.560
	B	1.650	1.658	1.670	1.673	1.619	1.620	1.626	1.627
	C	1.555	1.558	1.558	1.558	1.557	1.557	1.560	1.562
2	A	2.092	2.102	2.095	2.094	2.093	2.123	2.059	2.060
	B	2.032	2.037	2.045	2.047	1.915	1.917	1.918	1.918
	C	1.895	1.896	1.905	1.897	1.896	1.898	1.901	1.895
3	A	1.655	1.655	1.656	1.656	1.653	1.655	1.640	1.639
	B	1.496	1.497	1.498	1.498	1.497	1.497	1.475	1.473
	C	1.581	1.585	1.583	1.583	1.581	1.586	1.585	1.582
4	A	0.546	0.546	0.544	0.544	0.543	0.538	0.539	0.535
	B	0.626	0.624	0.623	0.622	0.622	0.619	0.621	0.617
	C	0.650	0.649	0.647	0.650	0.652	0.648	0.646	0.649
5	A	0.909	0.905	0.904	0.905	0.909	0.910	0.888	-
	B	0.822	0.823	0.820	0.819	0.818	0.817	0.826	-
	C	0.773	0.775	0.772	0.772	0.771	0.770	0.771	-
6	A	1.467	1.463	1.464	1.467	1.468	-	-	-
	B	1.438	1.437	1.383	1.372	1.348	-	-	-
	C	1.485	1.481	1.460	1.457	1.420	-	-	-
7	A	1.942	1.819	1.821	1.820	1.820	-	1.820	-
	B	1.818	1.768	1.770	1.768	1.770	-	1.769	-
	C	1.881	1.889	1.890	1.889	1.890	-	1.866	-
8	A	2.296	2.314	2.326	2.275	2.207	2.130	2.103	2.084
	B	2.257	2.265	2.244	2.219	2.166	2.168	2.163	2.086
	C	2.255	2.269	2.269	2.253	2.170	2.113	2.114	2.099
9	A	1.993	1.993	1.992	1.984	1.940	1.883	1.878	1.877
	B	2.075	2.076	1.978	1.980	1.975	1.967	1.957	1.935
	C	2.035	2.038	2.043	1.929	1.893	1.890	1.884	1.866
10	A	2.172	2.162	2.161	2.165	2.169	2.164	2.157	2.160
	B	2.176	2.176	2.167	2.166	2.147	2.135	2.115	2.119
	C	2.175	2.180	2.182	2.190	2.062	2.054	2.048	2.048
11	A	-	2.365	2.270	2.178	2.142	1.929	1.697	1.594
	B	-	2.453	2.371	2.341	2.307	2.116	1.864	1.752
	C	-	2.422	2.281	2.243	2.204	1.982	1.716	1.589
12	A	1.981	1.979	1.865	1.789	1.649	1.300	0.992	0.987
	B	2.041	2.034	1.870	1.802	1.614	1.320	1.032	1.026
	C	1.927	1.927	1.810	1.736	1.625	1.228	1.007	1.002
13	A	2.190	2.190	2.014	1.906	1.643	1.222	0.853	0.852
	B	2.070	2.070	1.901	1.803	1.525	1.216	0.773	0.768
	C	1.987	1.987	1.811	1.718	1.491	1.078	0.464	0.462
14	A	2.606	2.600	2.213	2.046	1.786			
	B	2.638	2.601	2.302	2.159	1.975			
	C	2.251	2.240	1.977	1.880	1.612			

(continued)

(continued)

Unit no.	Flat leg on	Dates of measurements							
		13.11. 70 (1)	31.12. 70 (2)	28.3. 71	6.5. 71	7.7. 71	7.10. 71	18.4. 72	12.7. 72
15	A	1.892	1.688	0.785	0.580	0.285	1.622	0.353	0.054
	B	1.943	1.607	0.690	0.396	0.123	1.735	0.549	0.315
	C	1.750	1.741	0.854	0.519	0.268	1.706	0.631	0.374
16	A	2.647	2.341	2.112	2.070	2.002	1.971		
	B	2.283	1.270	1.266	1.272	1.271	1.278		
	C	1.776	1.753	1.630	1.587	1.556	1.475		
17	A	2.529	2.523	2.518	2.516	2.527	2.534	2.331	2.331
	B	2.485	2.481	2.495	2.480	2.479	2.486	2.000	1.809
	C	2.406	2.400	2.395	2.360	2.370	1.874	0.320	0.319

(1) units 10 to 17 measured on 15.11.70
(2) units 8, 9 and 10 measured on 30.12.70

Beach Data (inches)

Unit	13.11. 70	31.12. 70	28.3. 71	6.5. 71	7.7. 71	7.10. 71	18.4. 72	12.7. 72
11	boulder				boulder	boulder		2
12	9.5	6	3			3	5	9
13	6	3	4	3	4			9
14	4	4	7	6	7			

APPENDIX V

DATA FOR THE ANALYSIS OF CLIFF FORM

Introduction

The data presented in Appendix V are concerned with the character of the cliff. Three orthogonal views show its geology, morphometry and morphology (i.e. surface characteristics) and the nature of the foreshore seaward of that part of the cliff is depicted in the lower part of each worksheet. The approximate location of each of these sheets is shown in Fig. V.1.

Many parts of the cliff have been altered by mining and quarrying; the locations of such workings are shown. In such places, the cliff's morphometry was not measured in detail. Those stretches of the cliff which are deemed to have their natural form or where the small adits have been erased by erosion have been used in the analysis described in Chapter 2. These parts are signified by a broad arrow at the top of the worksheet.

All the sheets are reduced in scale to a half of their original size; their scale in both vertical and horizontal dimensions is now 1 to 5000. In order to maintain clarity it has been necessary to codify the many categories of geology, morphology and foreshore type. A key together with other information follows:

Scale:

0 50 100 metres

Key:

General

⟷	part of the cliff used in the analysis described in Chapter 2
ct	cliff top
cf	cliff foot
LWMOT	low water mark of ordinary tides

Geology

LL	Lower Lias
SS	Sandy Series
IS	Ironstone Series
GS	Grey Shales
JRS	Jet Rock Series
BS	Bituminous Shales
HS	Hard Shales
AS	Alum Shales
LDS	Lower Deltaic Series
MDS	Middle Deltaic Series
GD	Glacial Deposits

Morphometry

Data are given in degrees using the format "slope/bearing from true north". Ringed figures are estimated not measured.

Morphology

b	bare rock exposed
d	cover of debris
g	cover of vegetation, usually grass
t	talus with no cover of vegetation
bg	undifferentiated areas of vegetation and bare rock
dg	undifferentiated areas of vegetation and debris
tg	talus covered by vegetation

Foreshore

SB	sandy beach
PB	pebble beach

T	thick boulders (boulders touching or piled up)
M	medium density boulders (boulders touching or up to 2.7m apart)
S	sparse boulders (boulders from 2.7 to 18.2m apart)
Pr	perched boulders (usually sparse)
bare	areas of bare shore platform
C	conglomerate

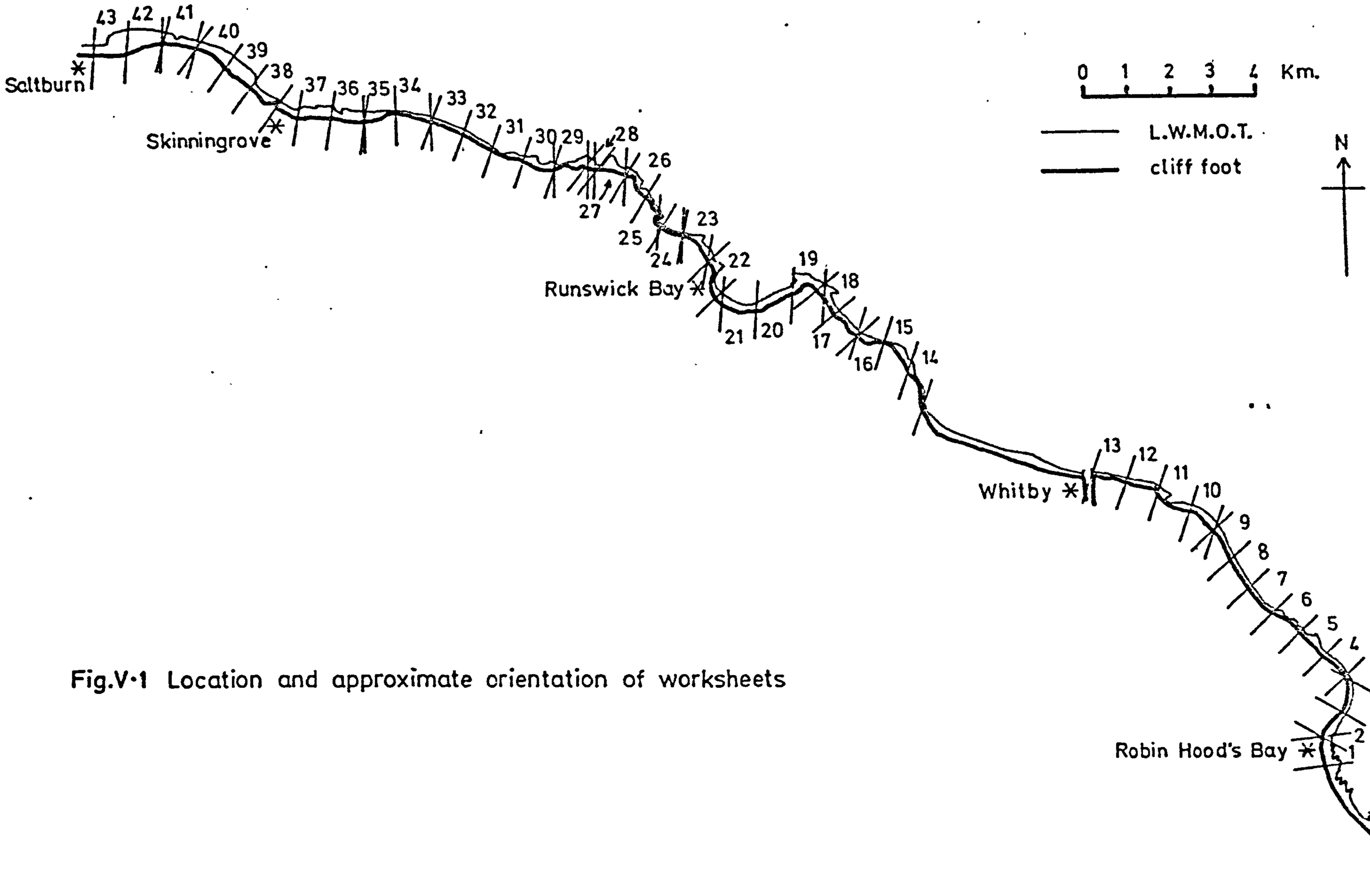
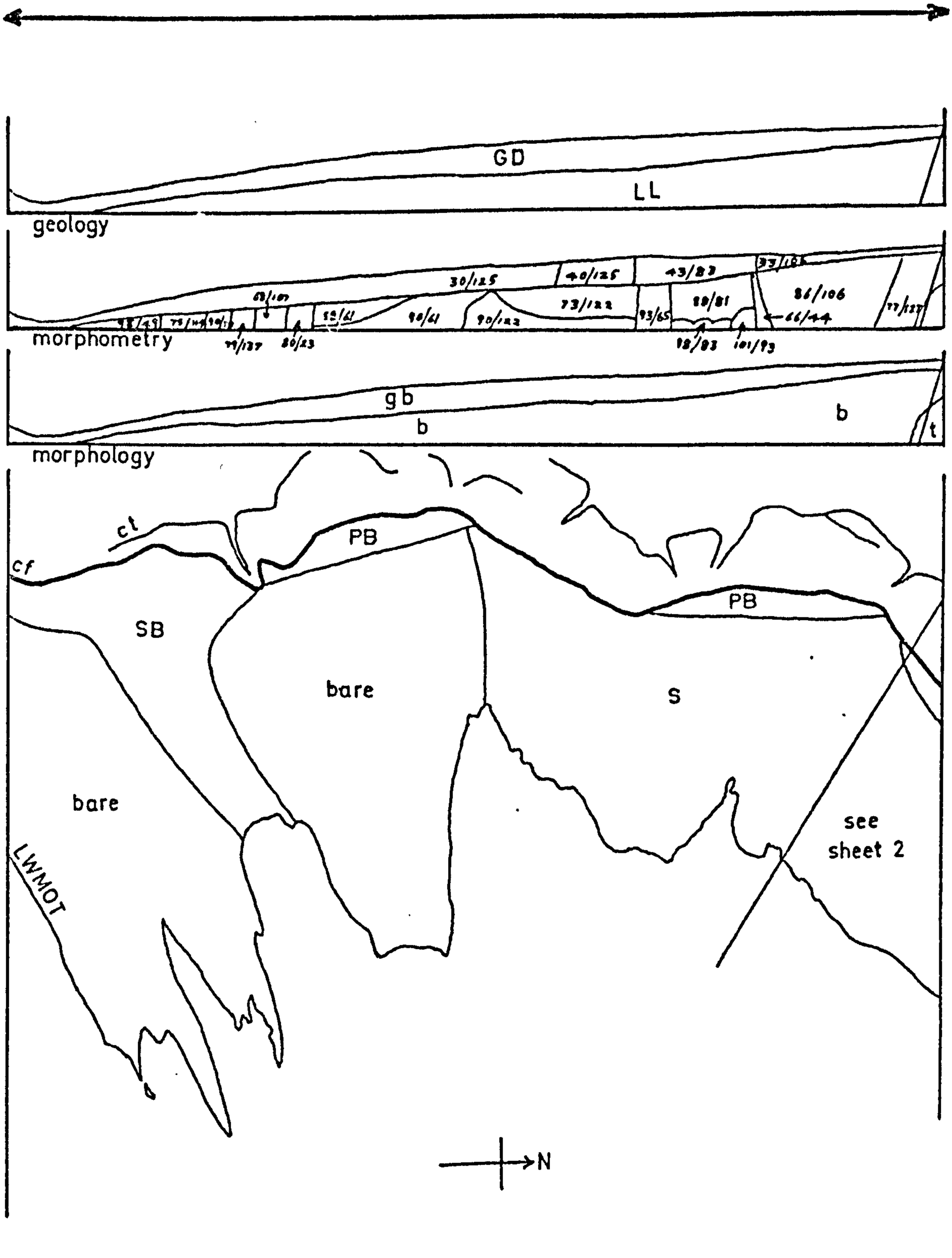
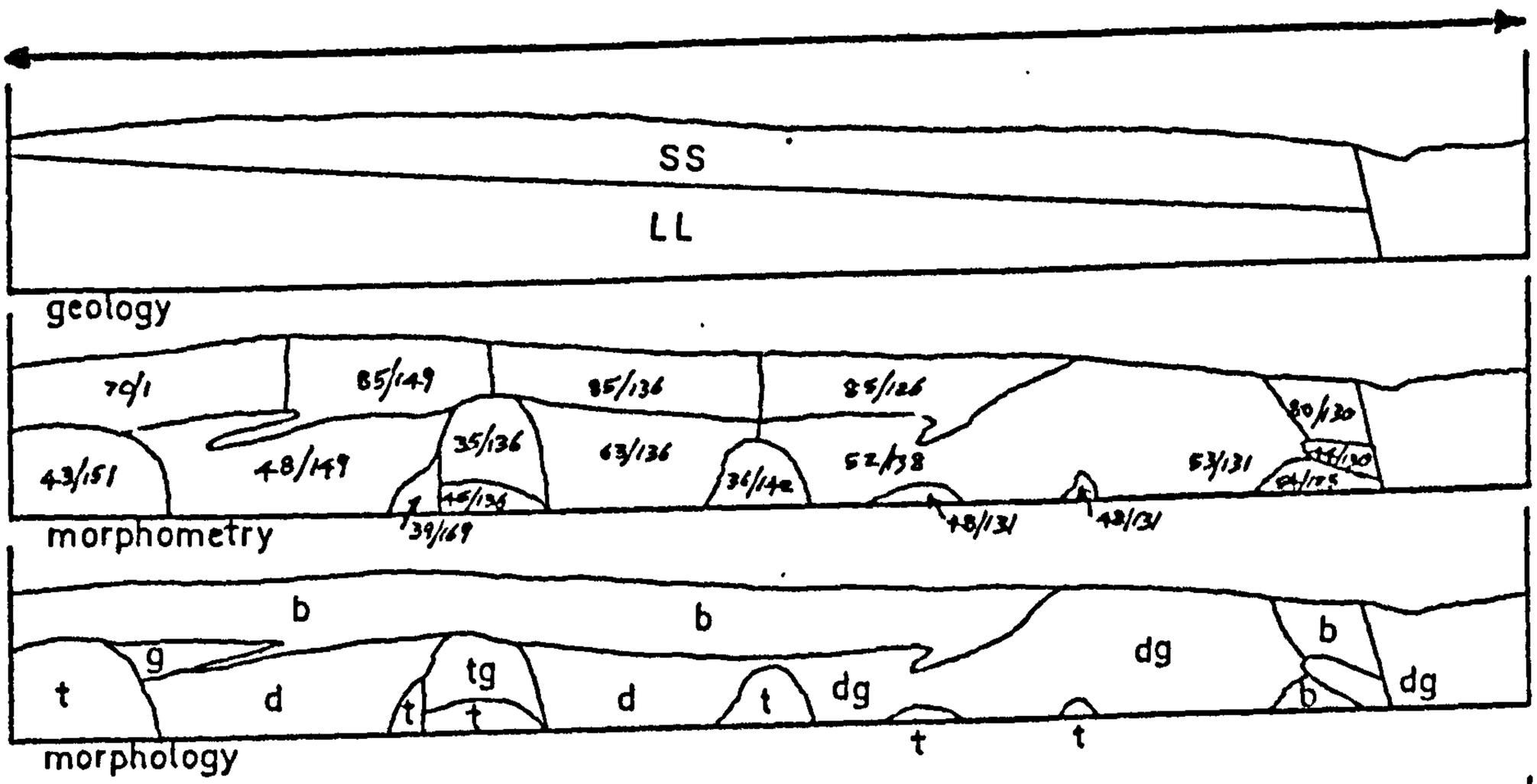


Fig.V·1 Location and approximate orientation of worksheets

SHEET 1


GD
LL
geology
30/125
40/125
43/83
33/181
63/107
73/122
88/81
86/106
93/65
66/44
77/127
98/43
75/114
99/137
80/23
58/61
90/41
90/122
98/83
101/93
morphometry
gb
b
b
t
morphology
ct
cf
PB
PB
SB
bare
S
bare
see
sheet 2
LWMOT
N

SHEET 2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LL
geology
79/1
85/149
85/136
85/126
80/130
43/151
48/149
35/136
63/136
36/142
52/138
53/131
46/136
39/169
48/131
42/131
morphometry
b
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b
g
tg
dg
dg
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b
dg
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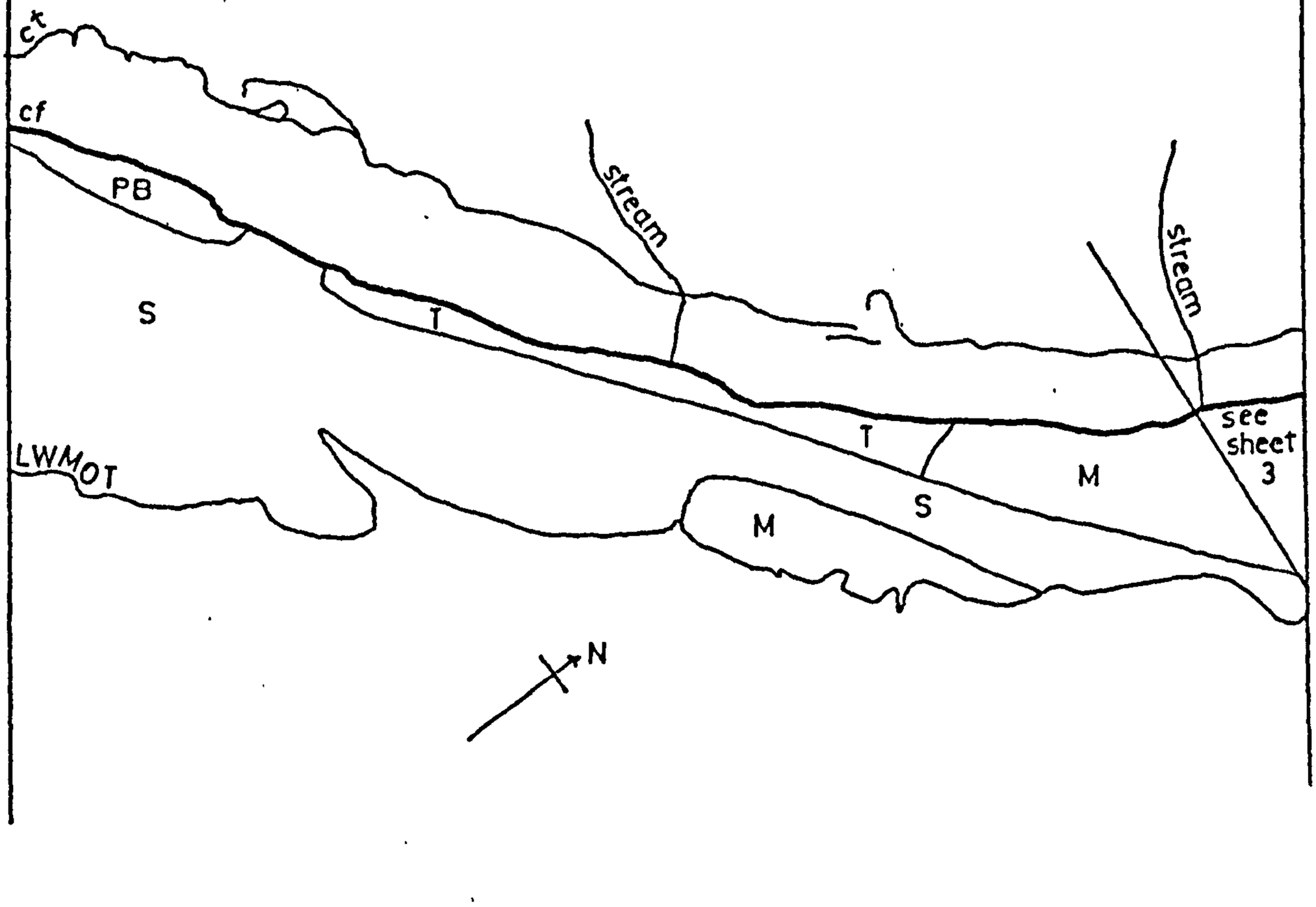
t
morphology


cf
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see sheet 3
LWMOT
S
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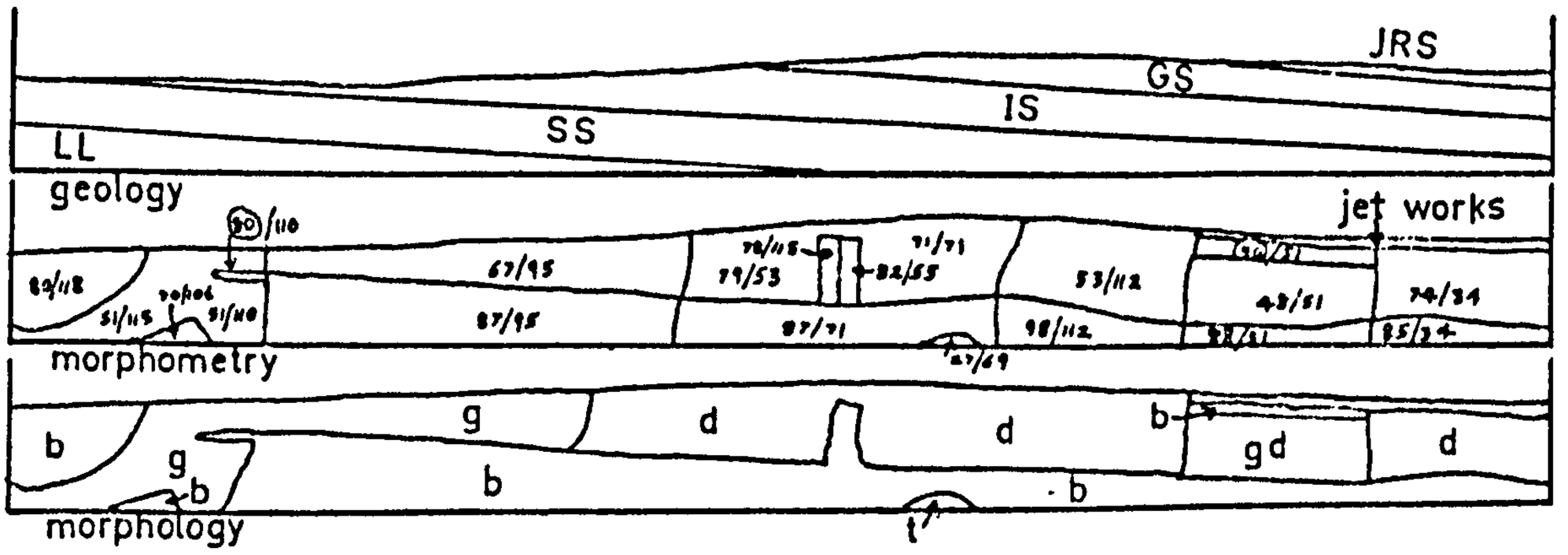
N

SHEET 3


JRS
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ct
cf
bare
Pr
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M
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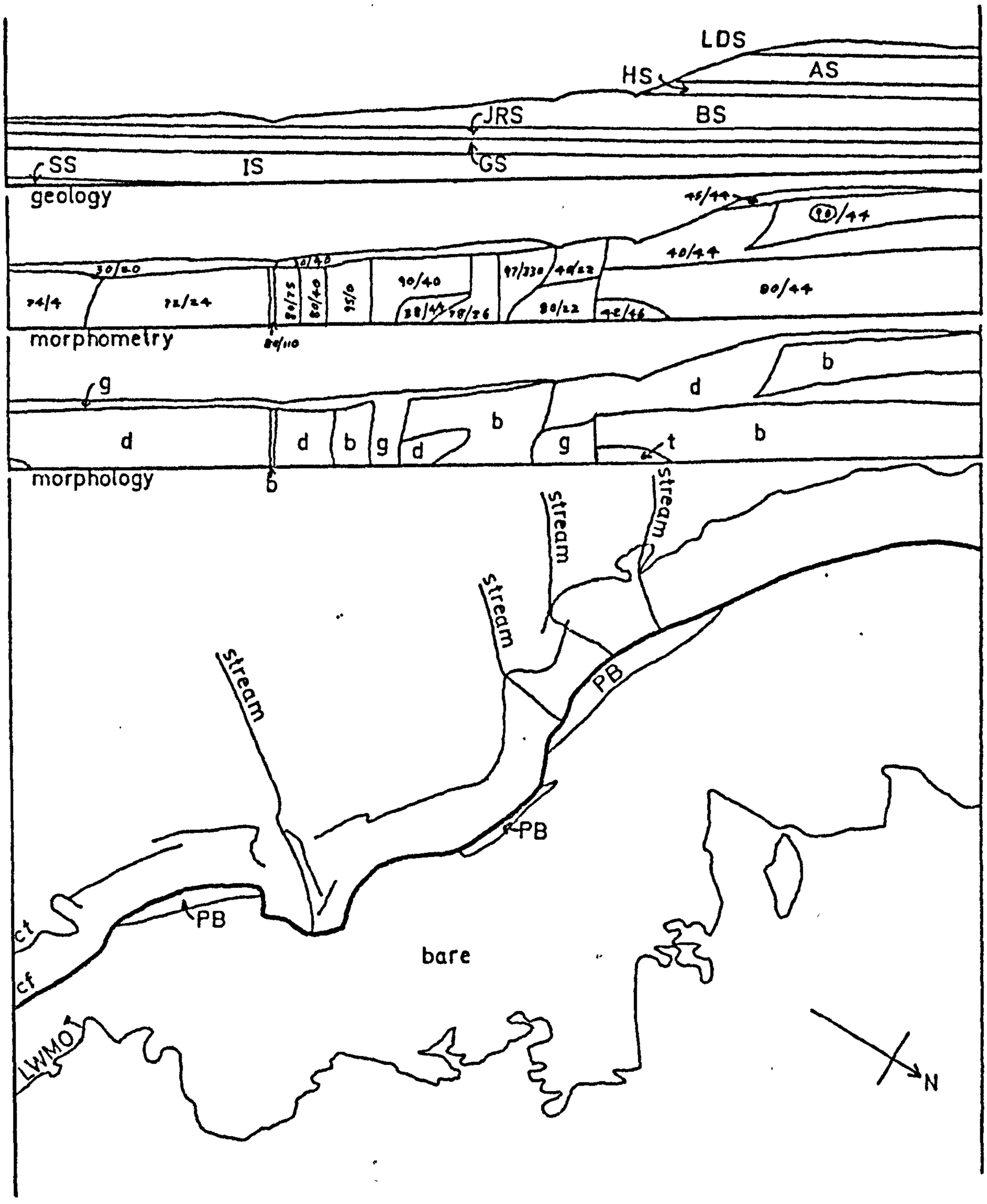
SHEET 4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HS
AS
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BS
SS
IS
GS
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40/44
30/20
0/40
74/4
72/24
80/175
80/40
95/0
90/40
38/4
78/26
97/330
44/22
80/22
80/44
morphometry
84/110
g
d
b
morphology
6
t
stream
PB
ct
cf
bare
LWMO
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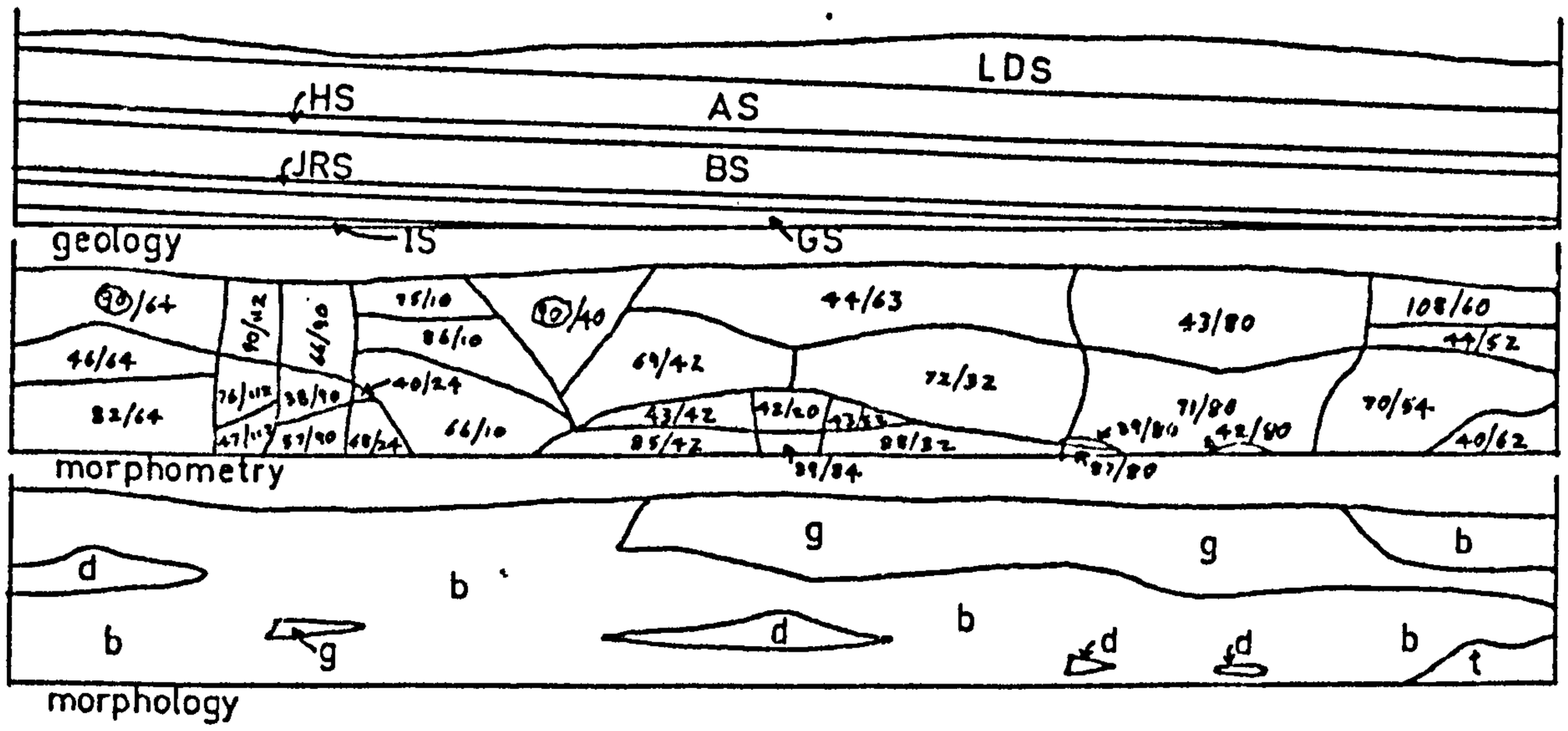
SHEET 5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AS
JRS
BS
IS
GS
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90/42
44/90
75/10
86/10
80/40
44/63
43/80
108/60
44/52
46/64
40/24
69/42
72/32
82/64
76/112
38/90
47/112
59/90
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66/10
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88/32
71/80
70/54
40/62
morphometry
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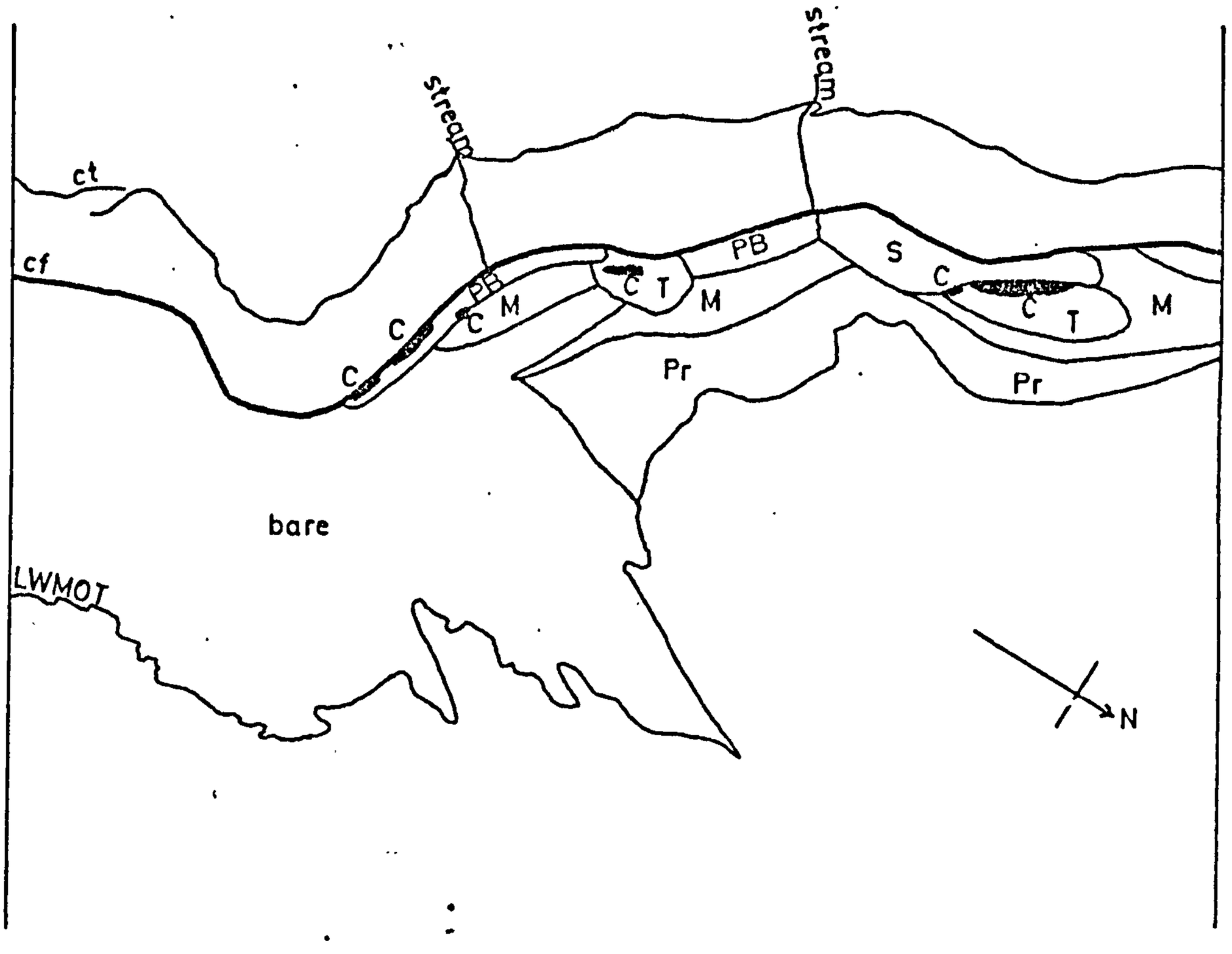
morphology


stream
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C
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LWMOT
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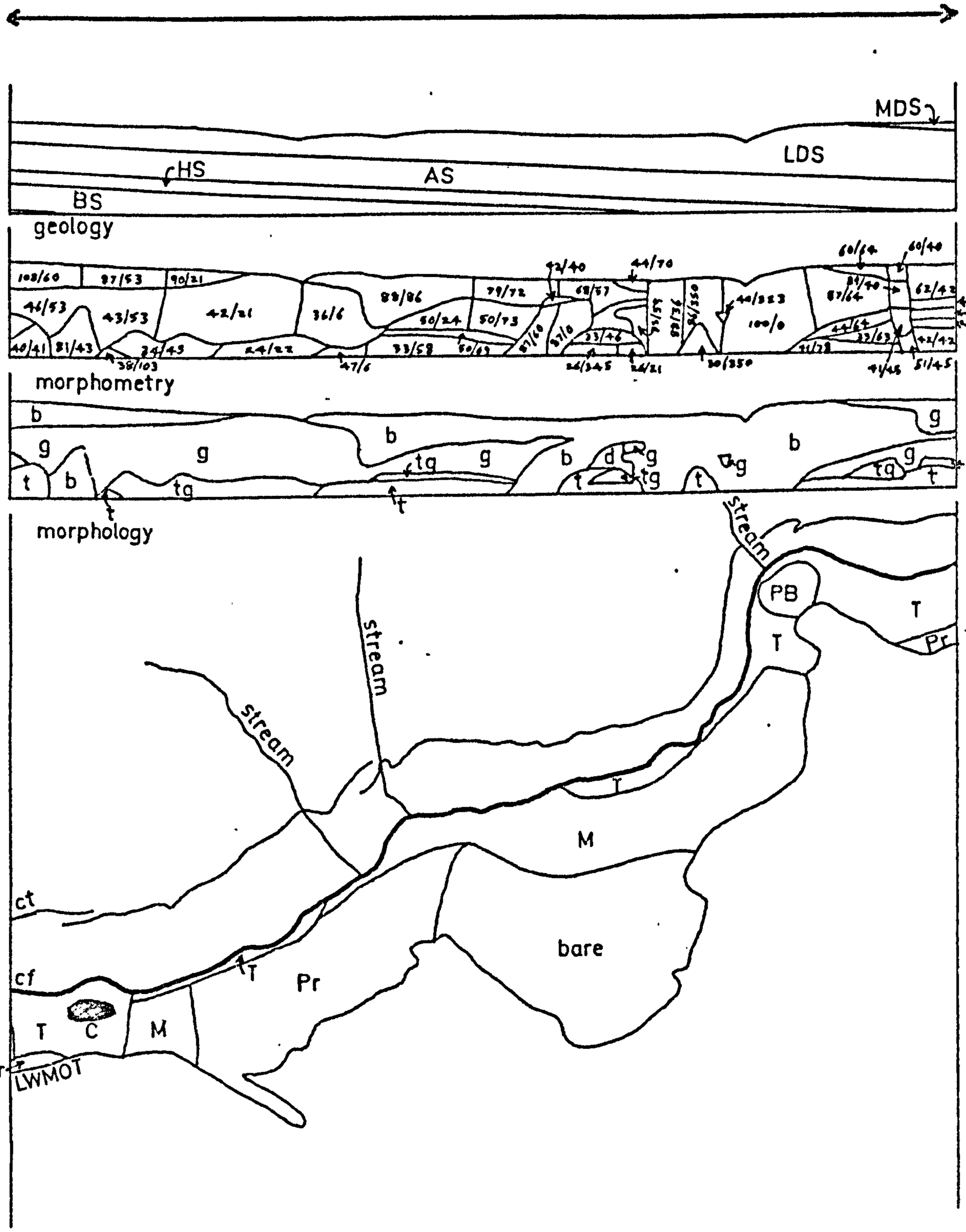
SHEET 6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79/72
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82/36
96/350
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100/0
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87/64
62/43
42/64
32/63
42/42
41/45
51/45
90/40
46/40
35/42
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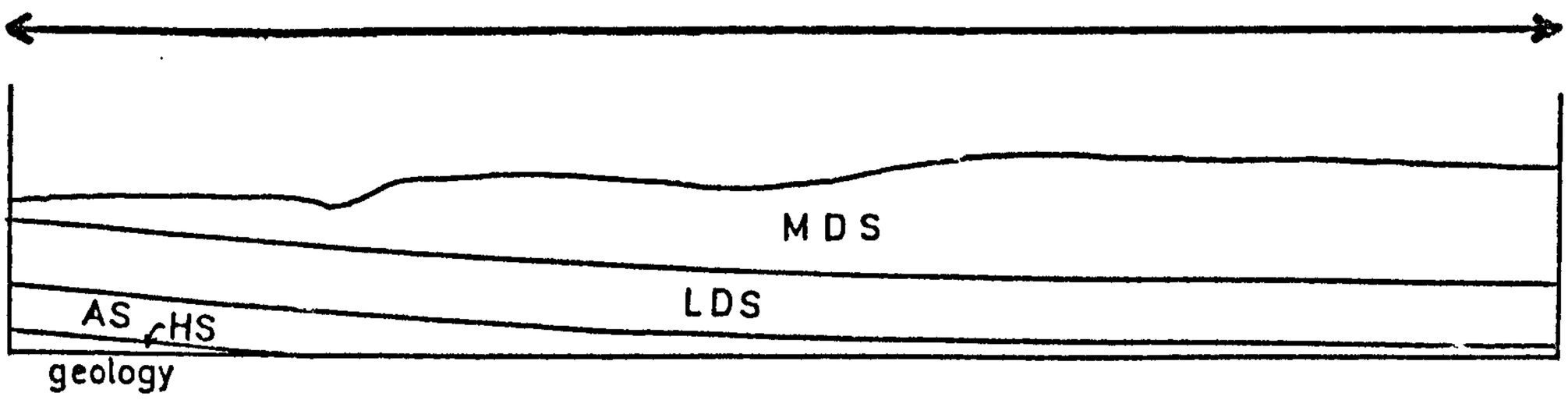
bare
LWMOT

SHEET 7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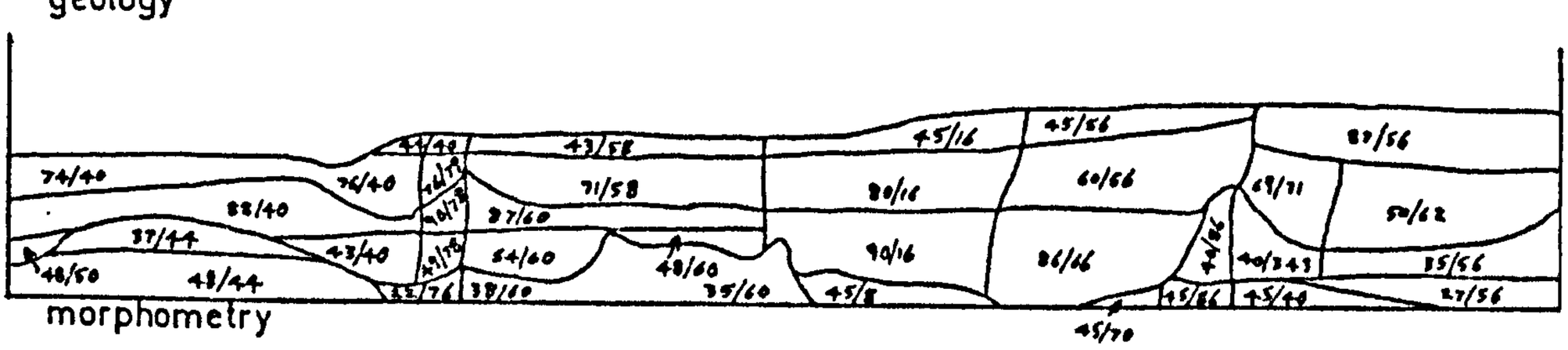
HS
geology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86/66
40/343
35/56
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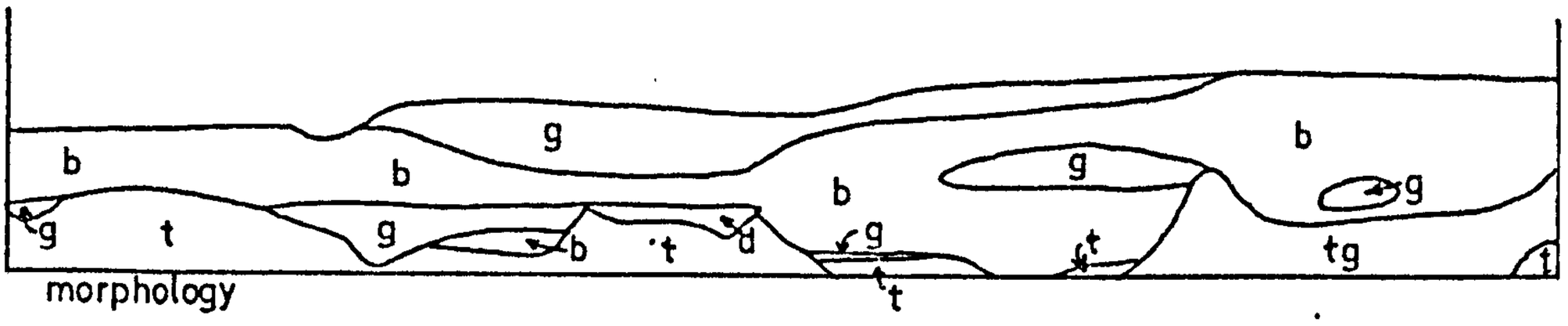
27/56
morphometry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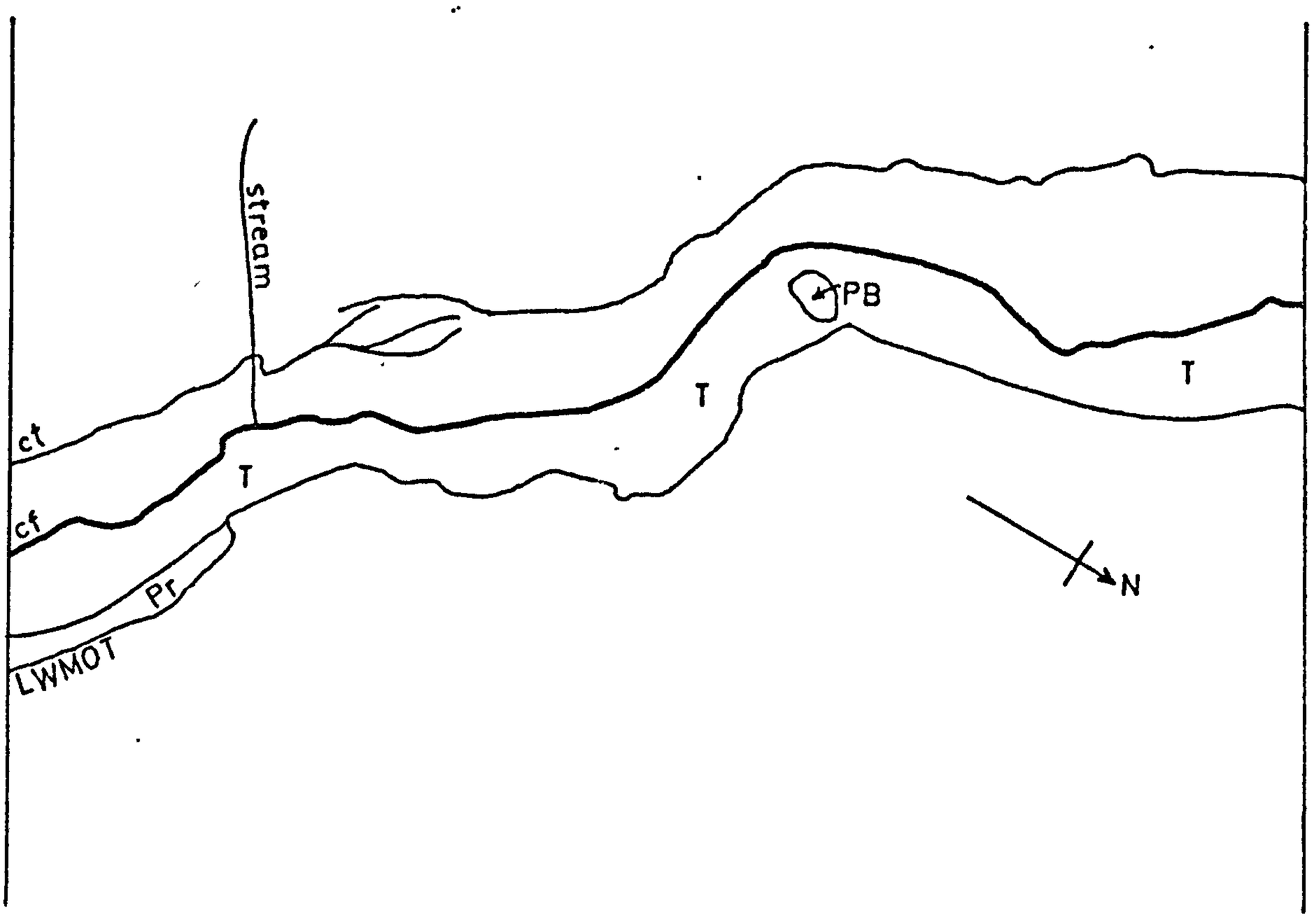
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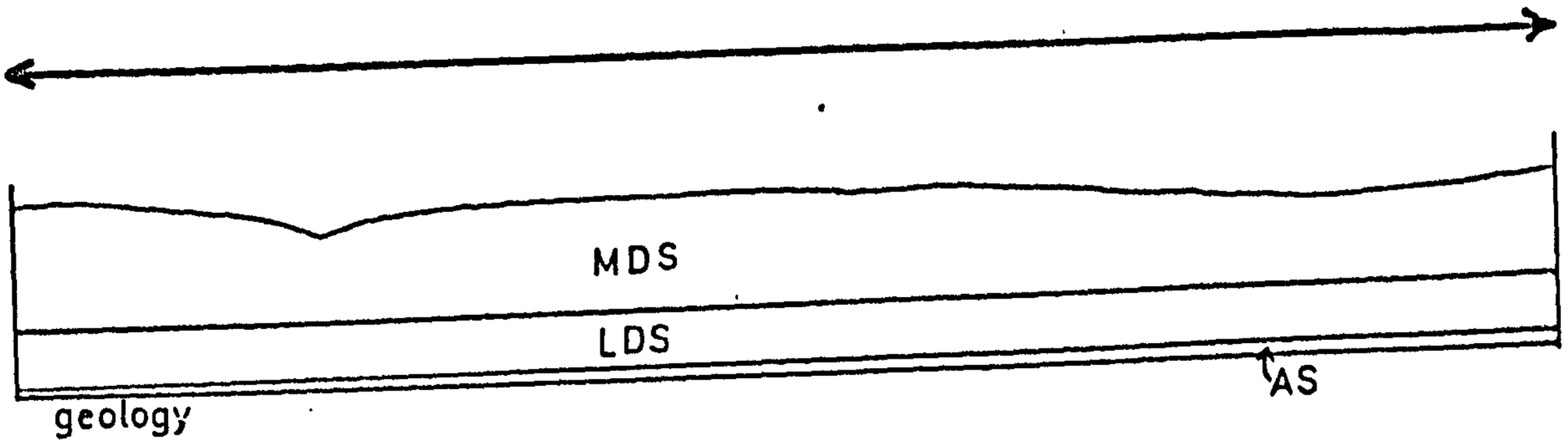
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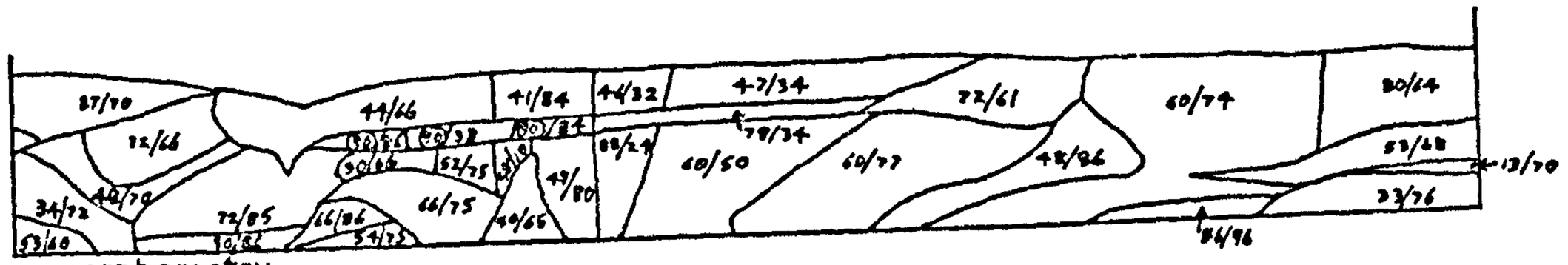
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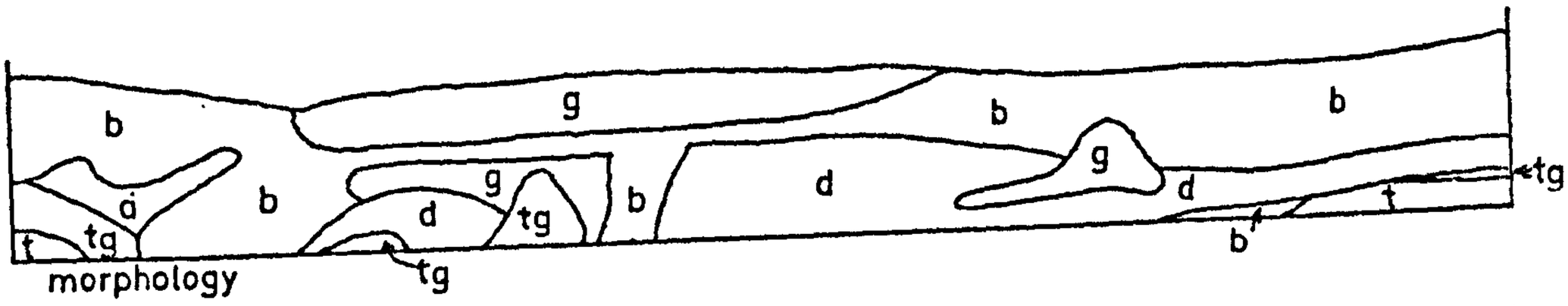
49/80
morphometry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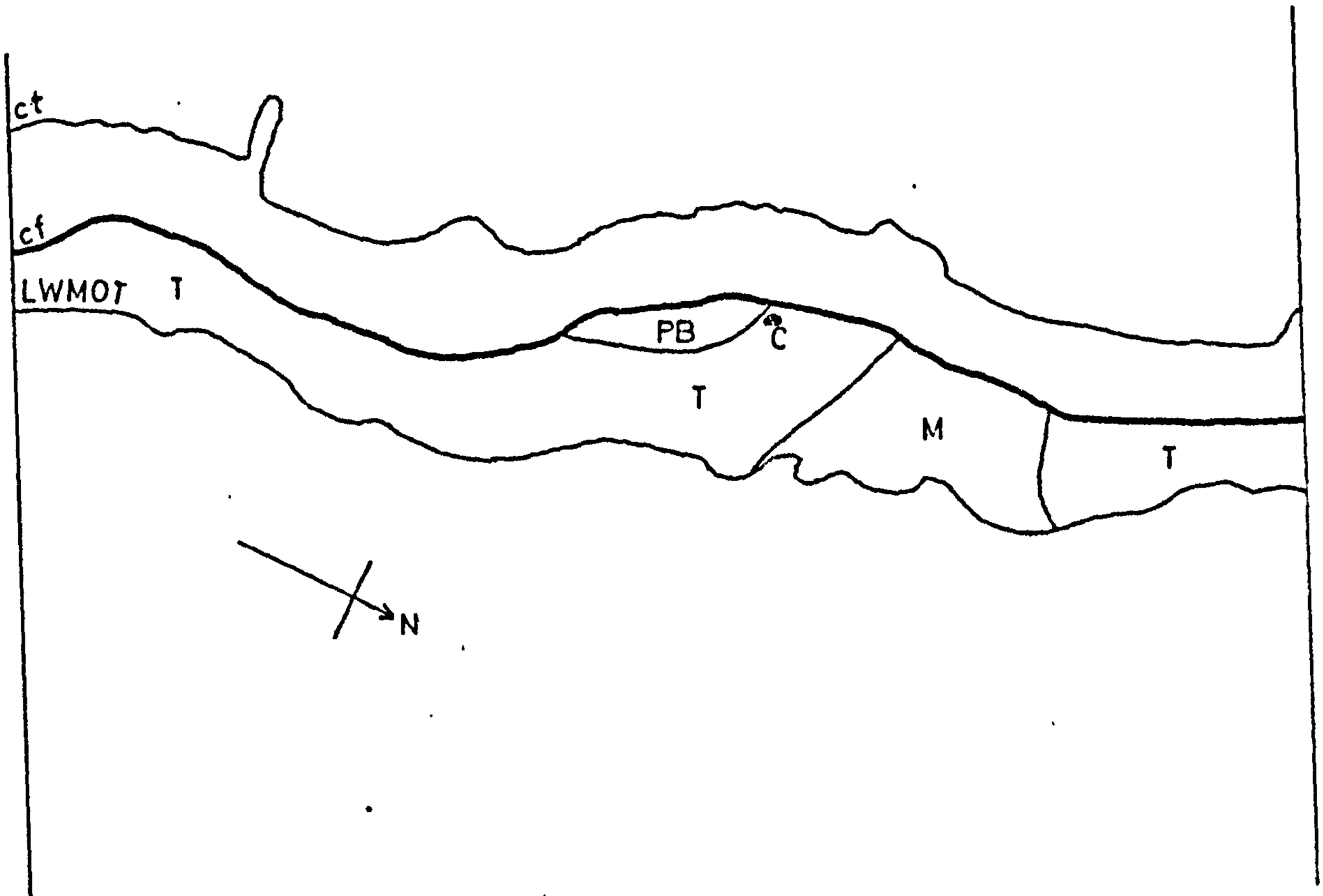
morphology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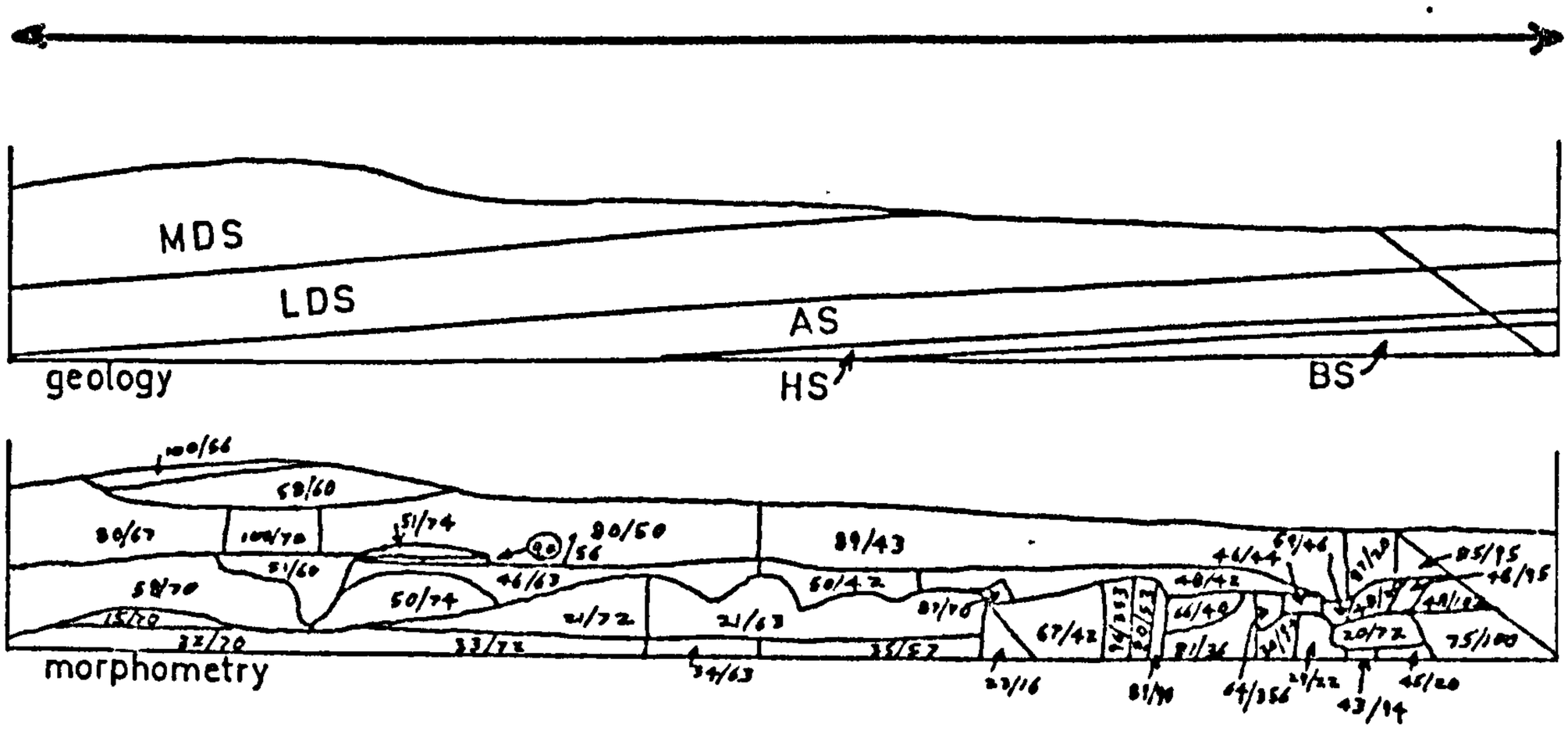
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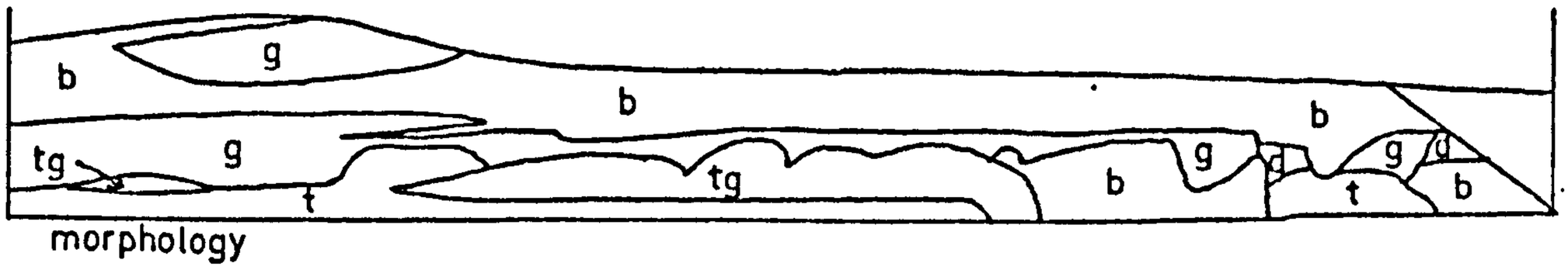
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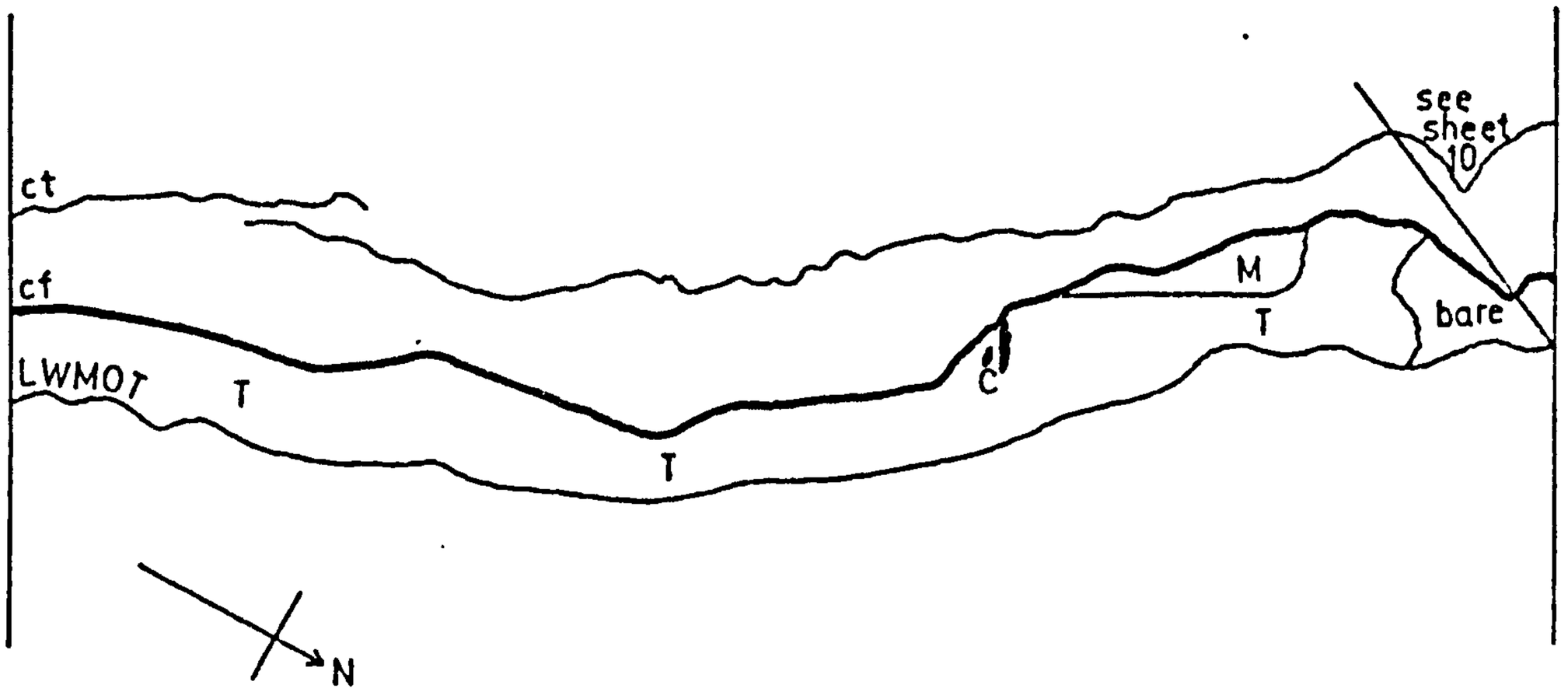
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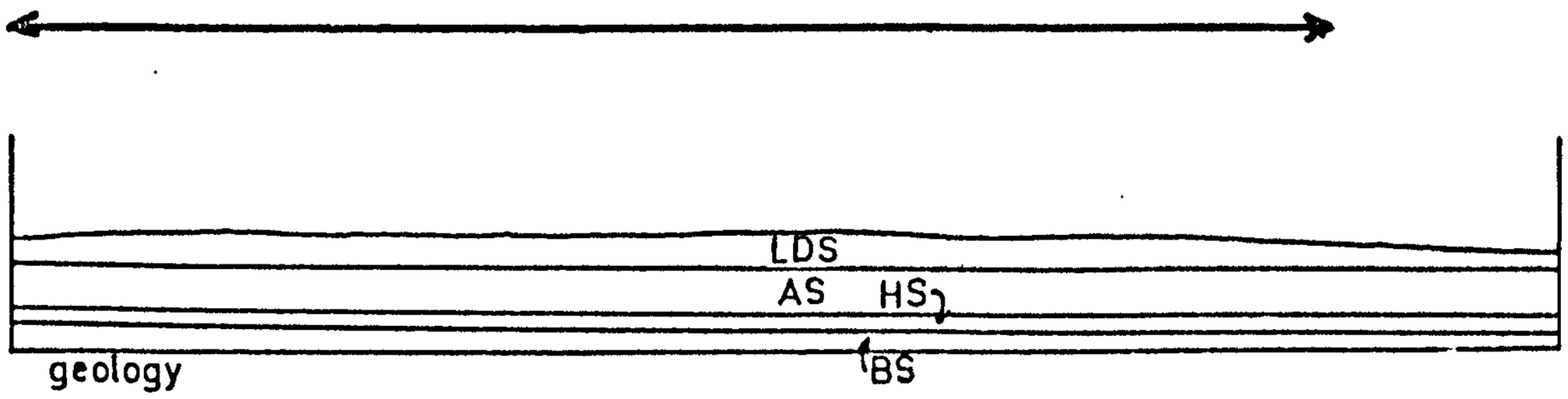
SHEET 10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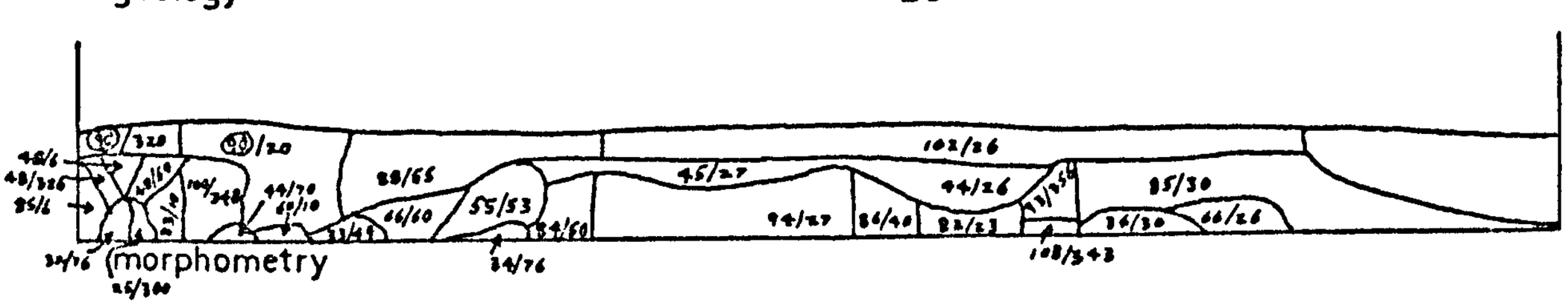
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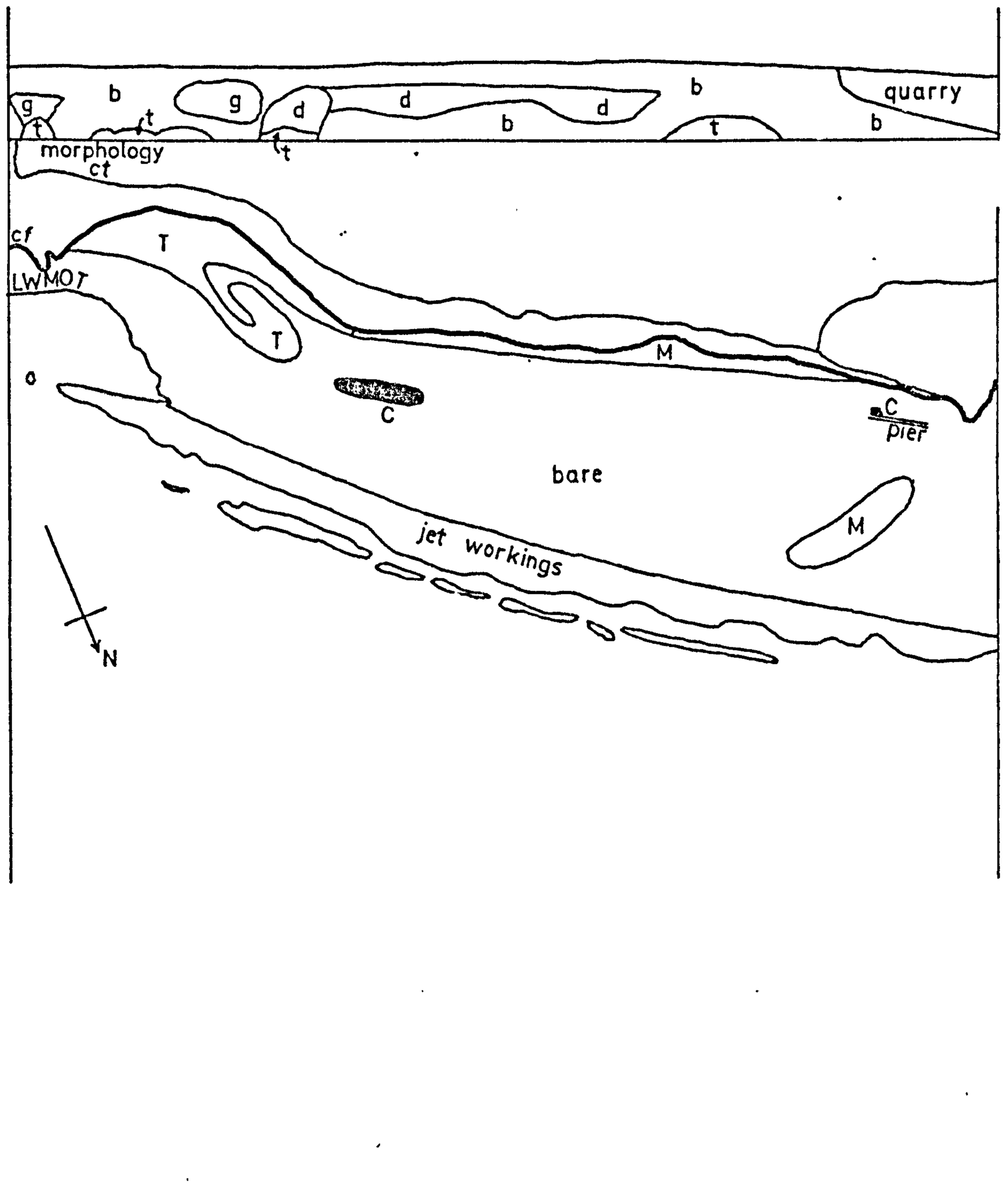
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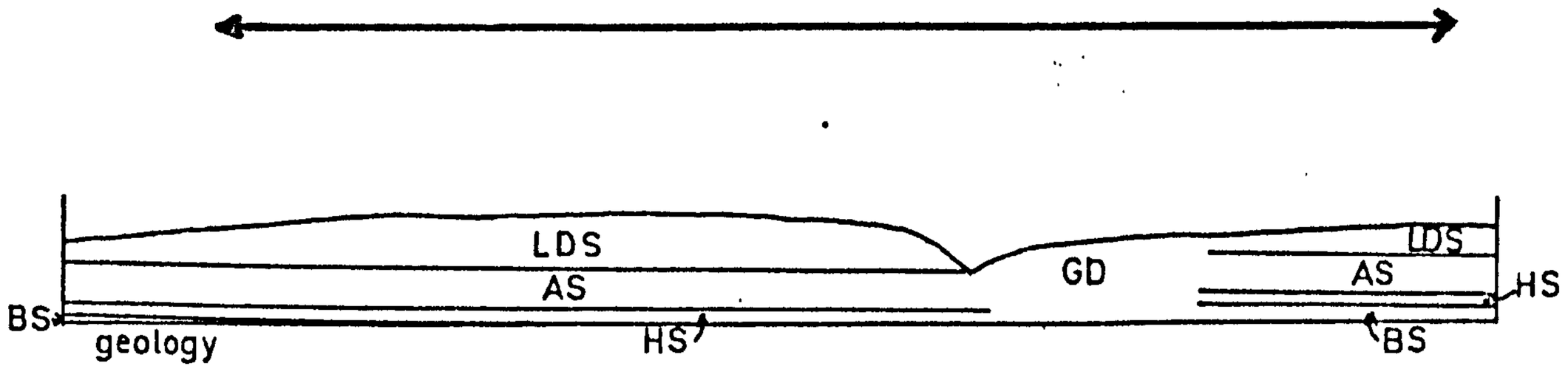
SHEET 11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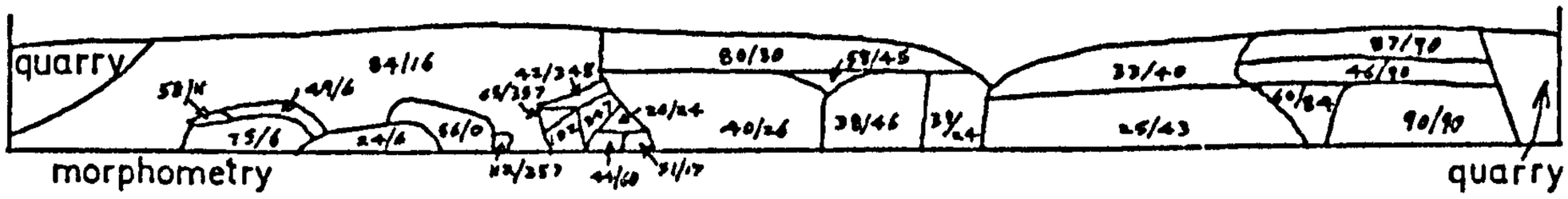
BS
geology
HS
GD
LDS
AS
HS
BS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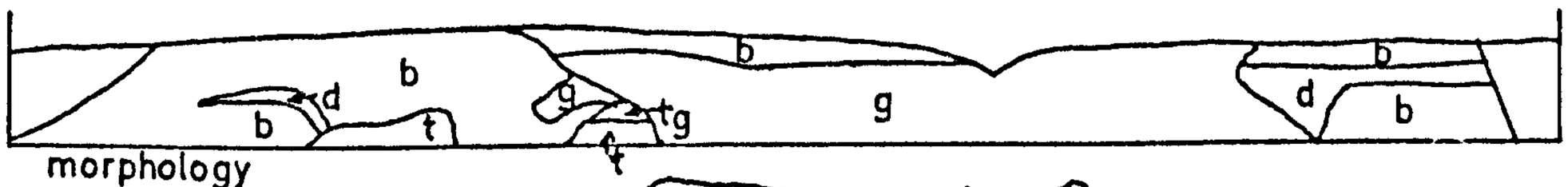
87/90
46/90
40/84
90/90
quarry
morphometry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tg
ft
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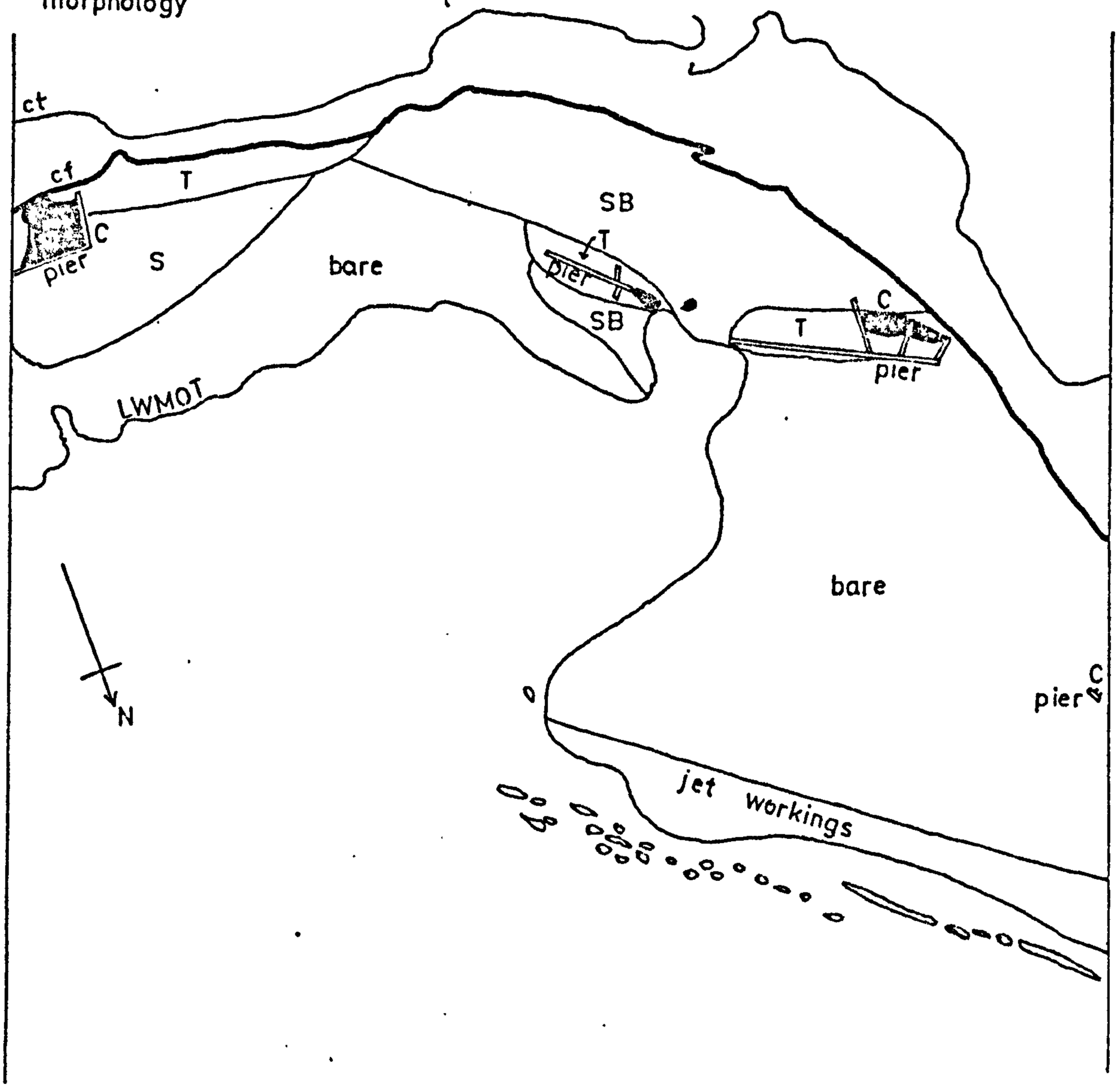
b
d
b
morphology


ct
cf
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SB
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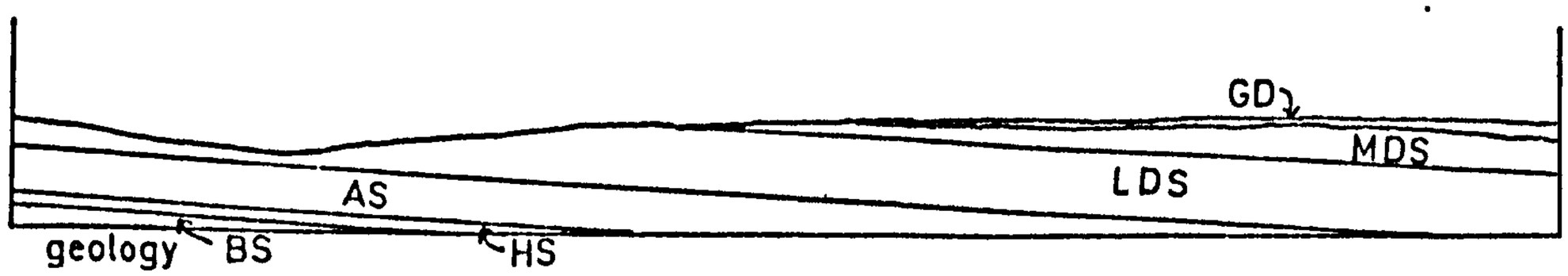
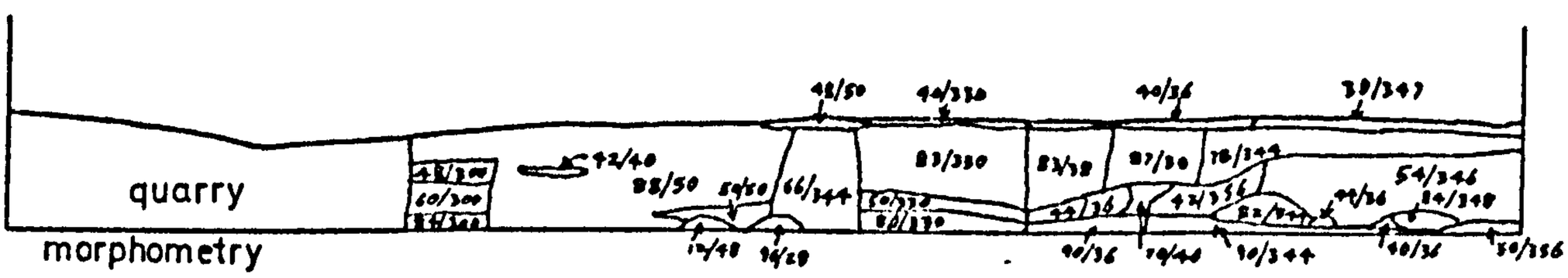
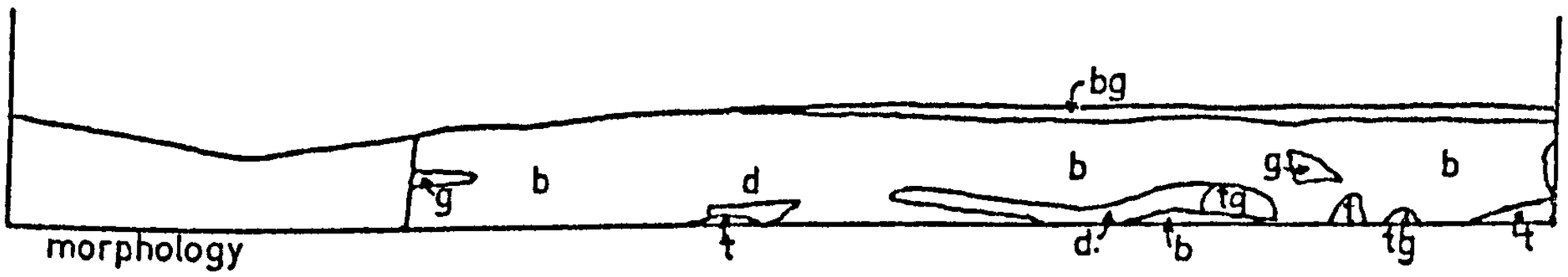
SHEET 12


GD
MDS
LDS
AS
geology
BS
HS


quarry
morphometry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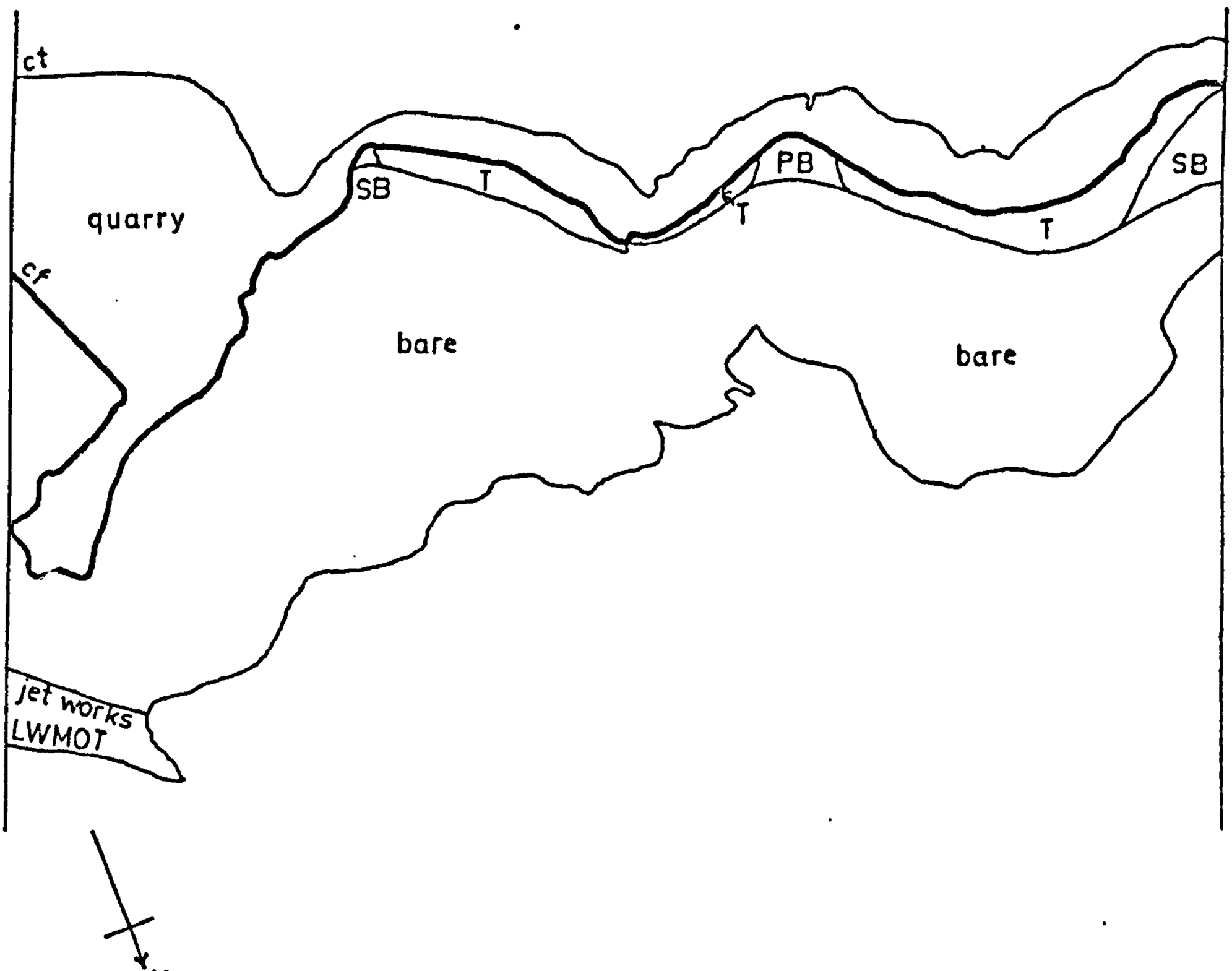
b
g
b
fg
morphology


ct
SB
T
PB
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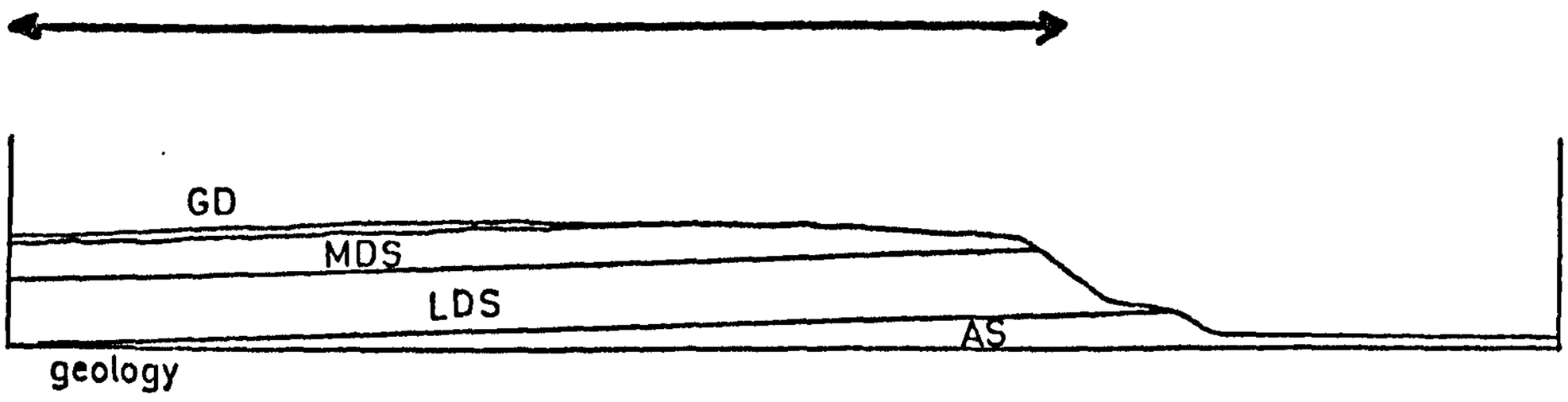
T
SB
quarry
cf
bare
bare
jet works
LWMOT
N

SHEET 13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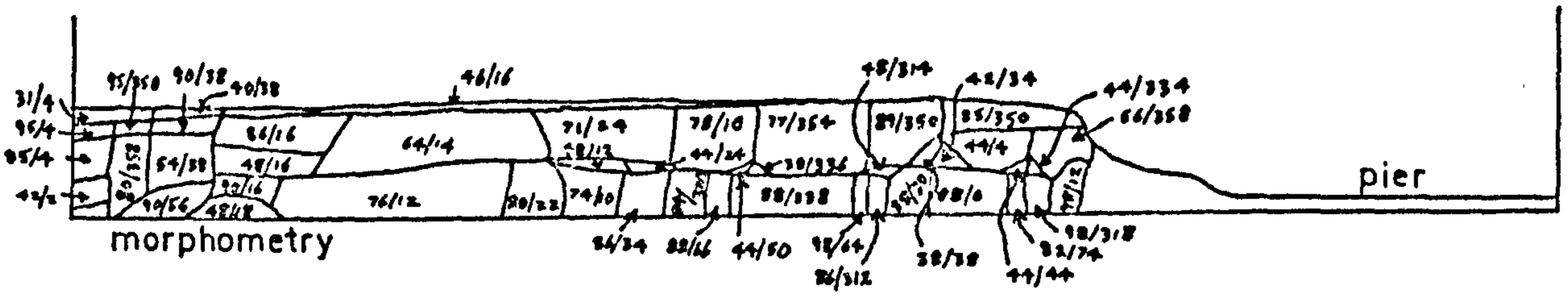
LDS
AS
geology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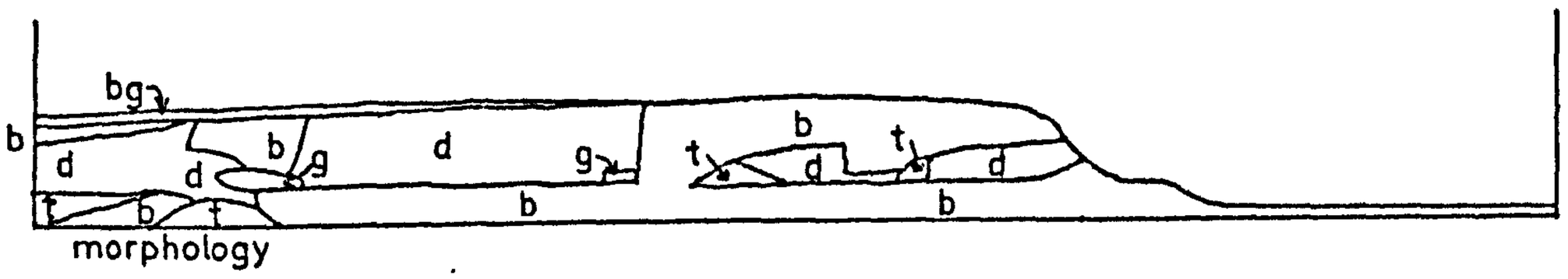
89/350
85/350
pier
morphometry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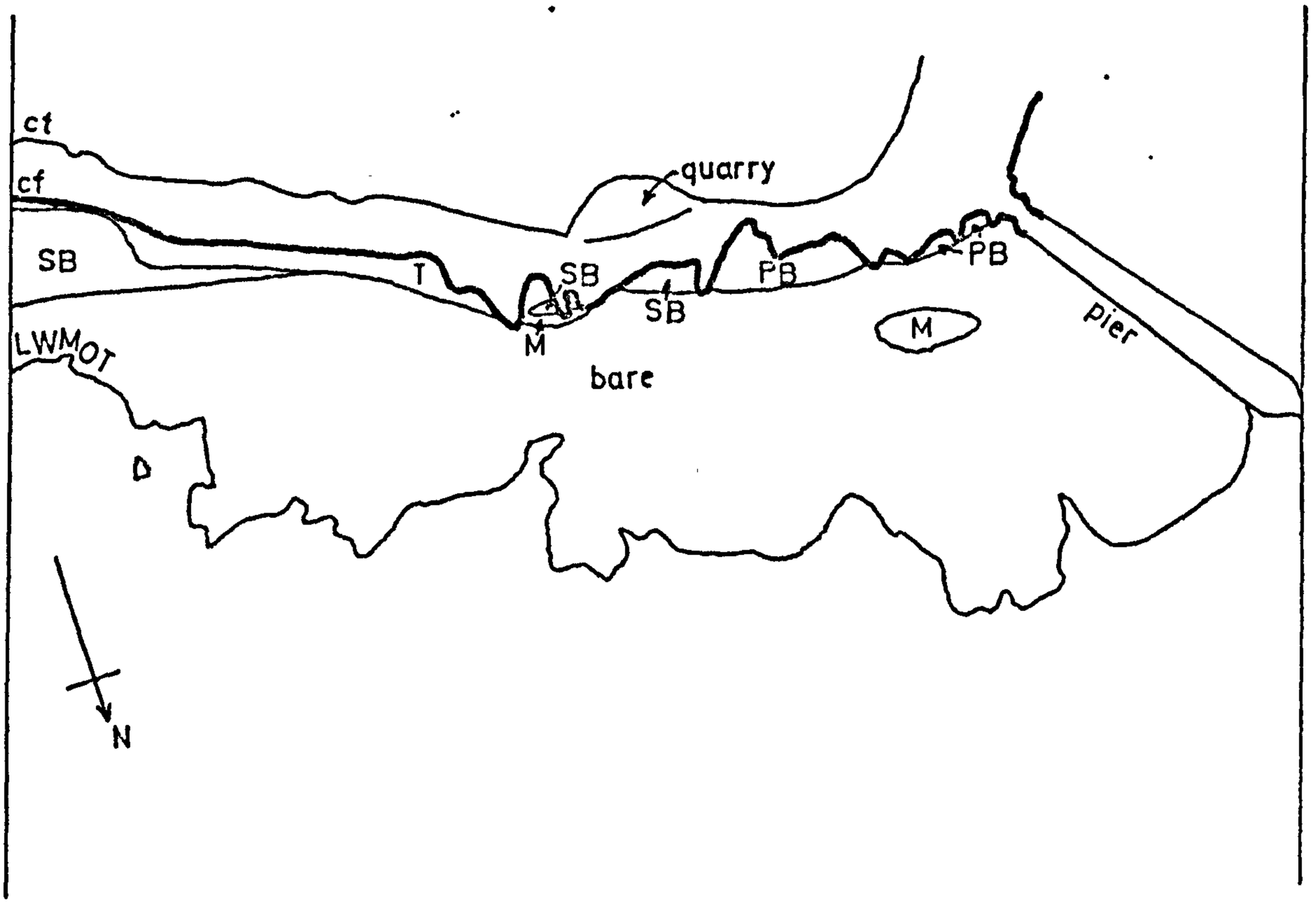
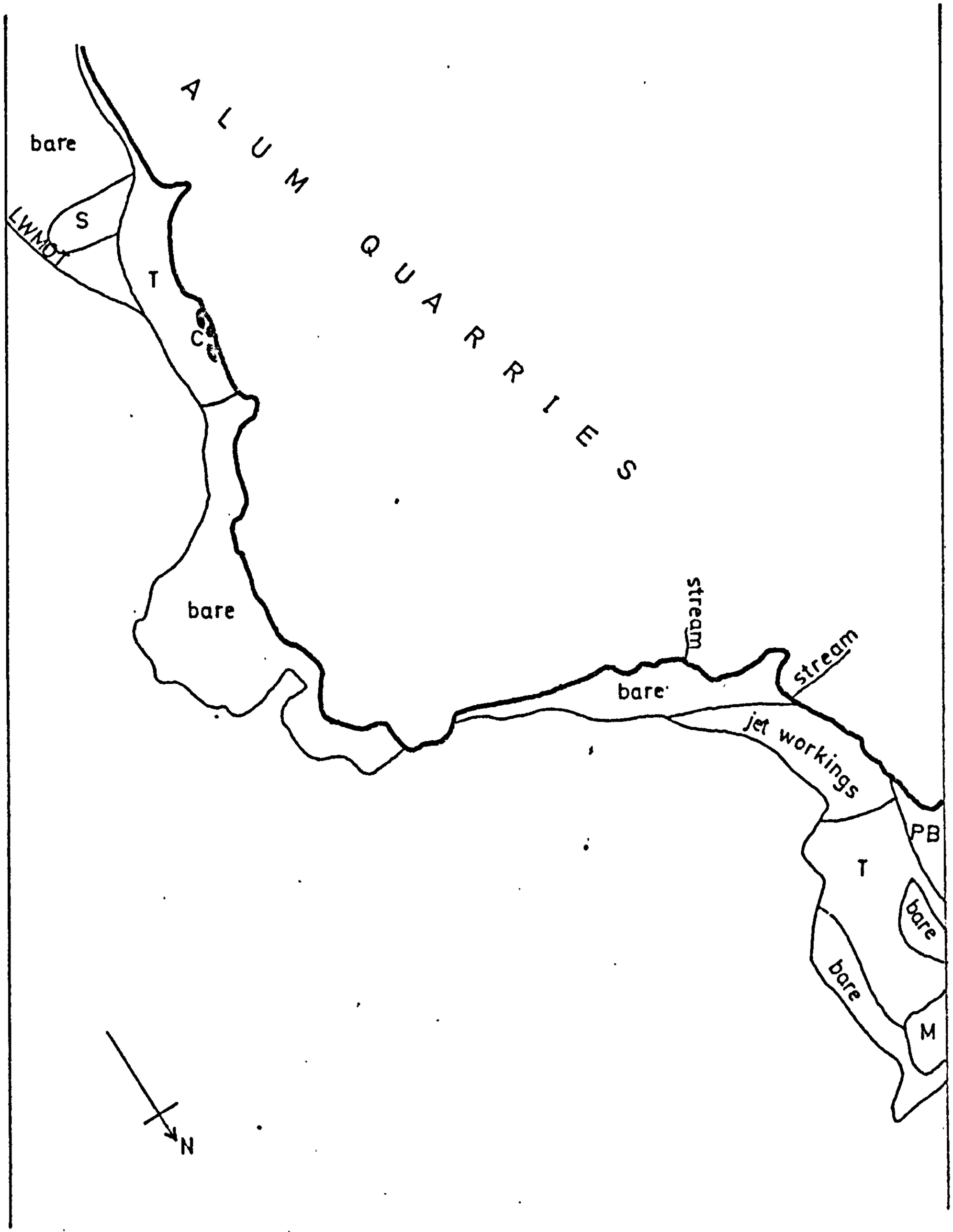
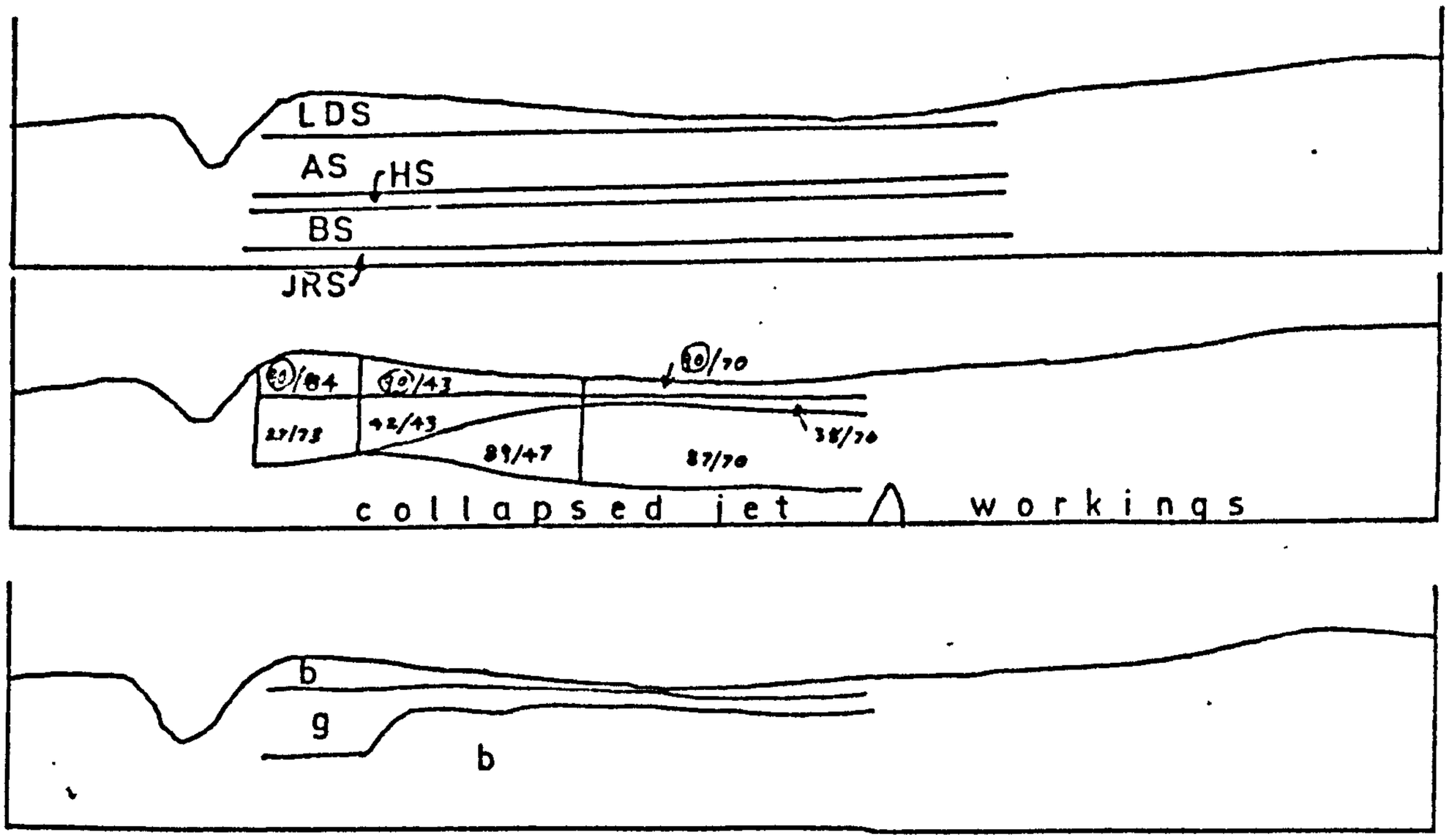
d
g
t
morphology

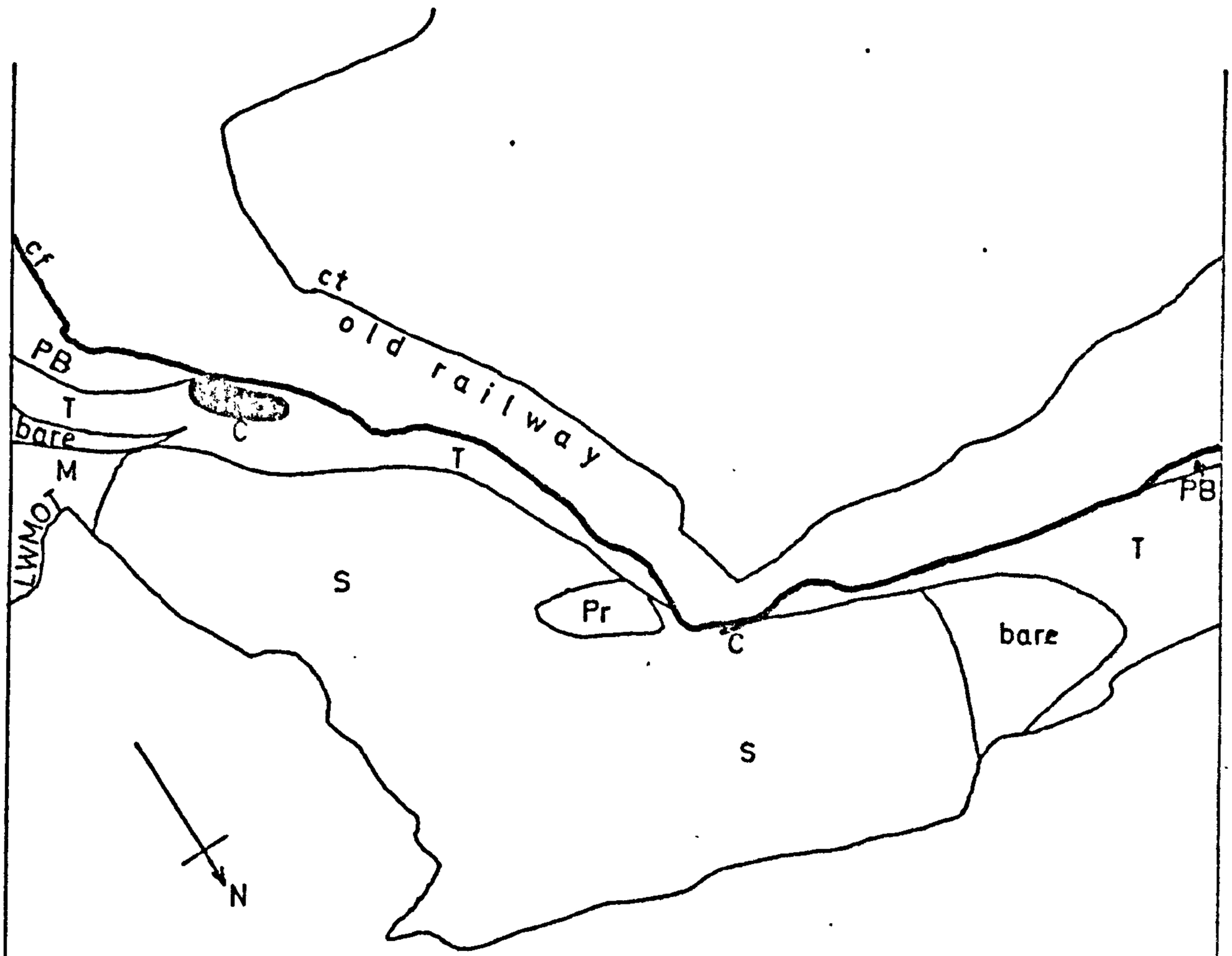

ct
cf
quarry
SB
T
M
PB
pier
LWMOT
bare
N

SHEET 14

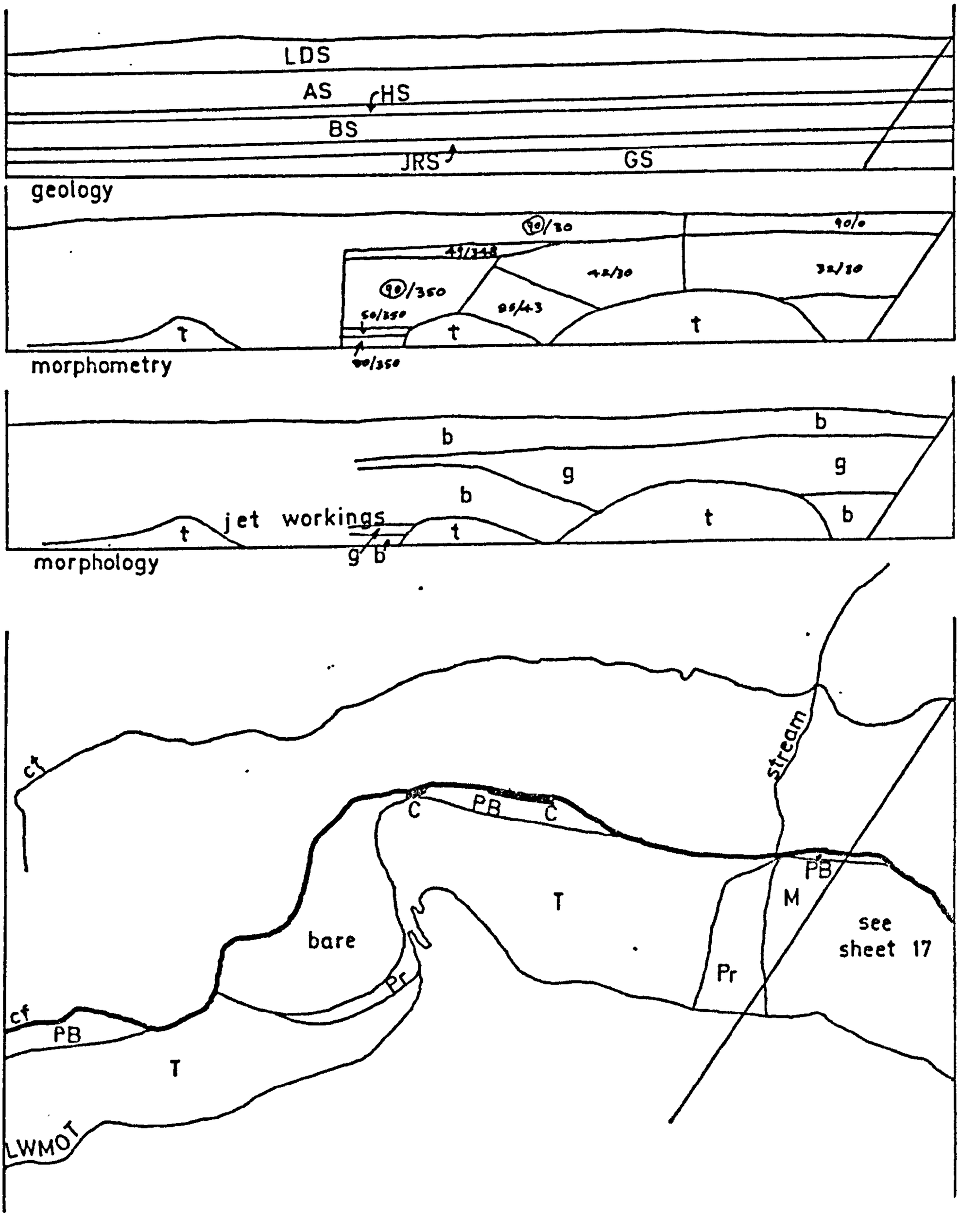

ALUM QUARRIES
bare
S
LWMDT
T
C
bare
stream
stream
bare
jet workings
PB
T
bare
bare
M
N

SHEET 15

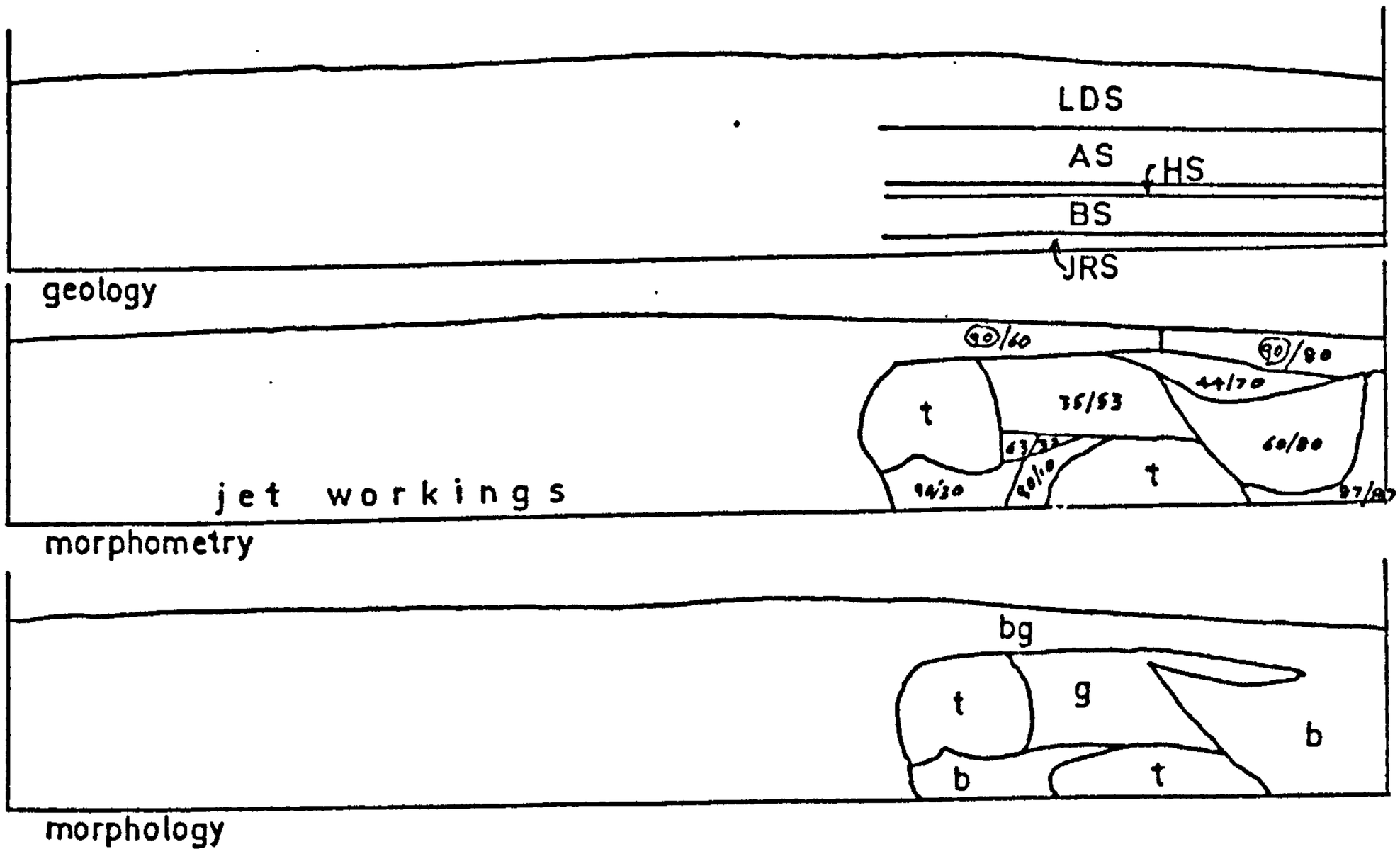

LDS
AS
HS
BS
JRS
90/84
90/43
90/70
23/73
92/43
89/47
87/70
38/70
collapsed jet workings
b
g
b


cf
ct
old railway
PB
T
bare
C
T
M
LWMOT
S
Pr
C
PB
T
bare
S
N

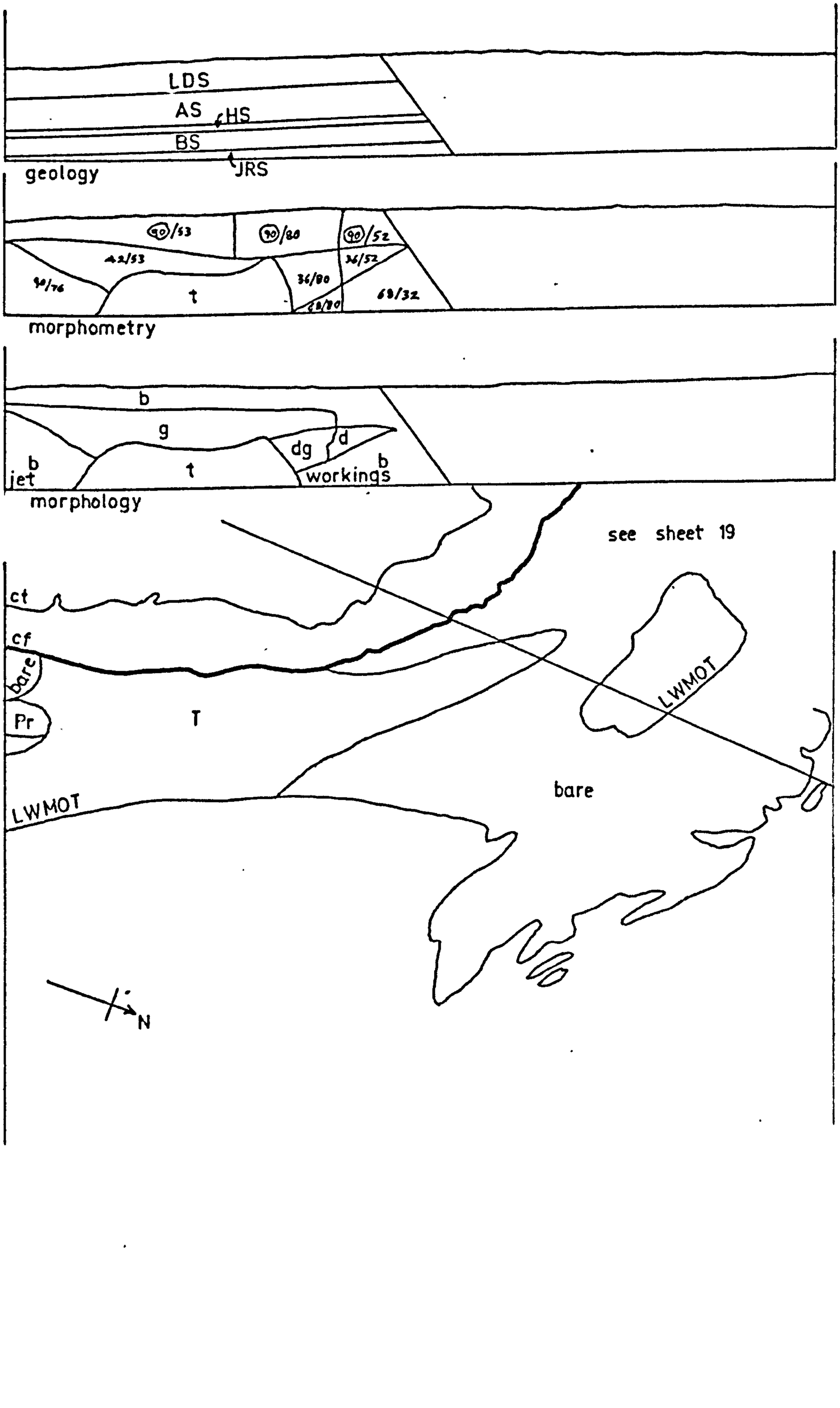
SHEET 16


LDS
AS
HS
BS
JRS
GS
geology
90/30
90/0
43/338
42/30
32/30
90/350
50/350
05/43
t
t
t
t
90/350
morphometry
b
b
g
g
b
t
jet workings
t
b
t
g
b
morphology
ct
C
PB
C
stream
PB
M
T
bare
Pr
Pr
see
sheet 17
cf
PB
T
LWMOT
N

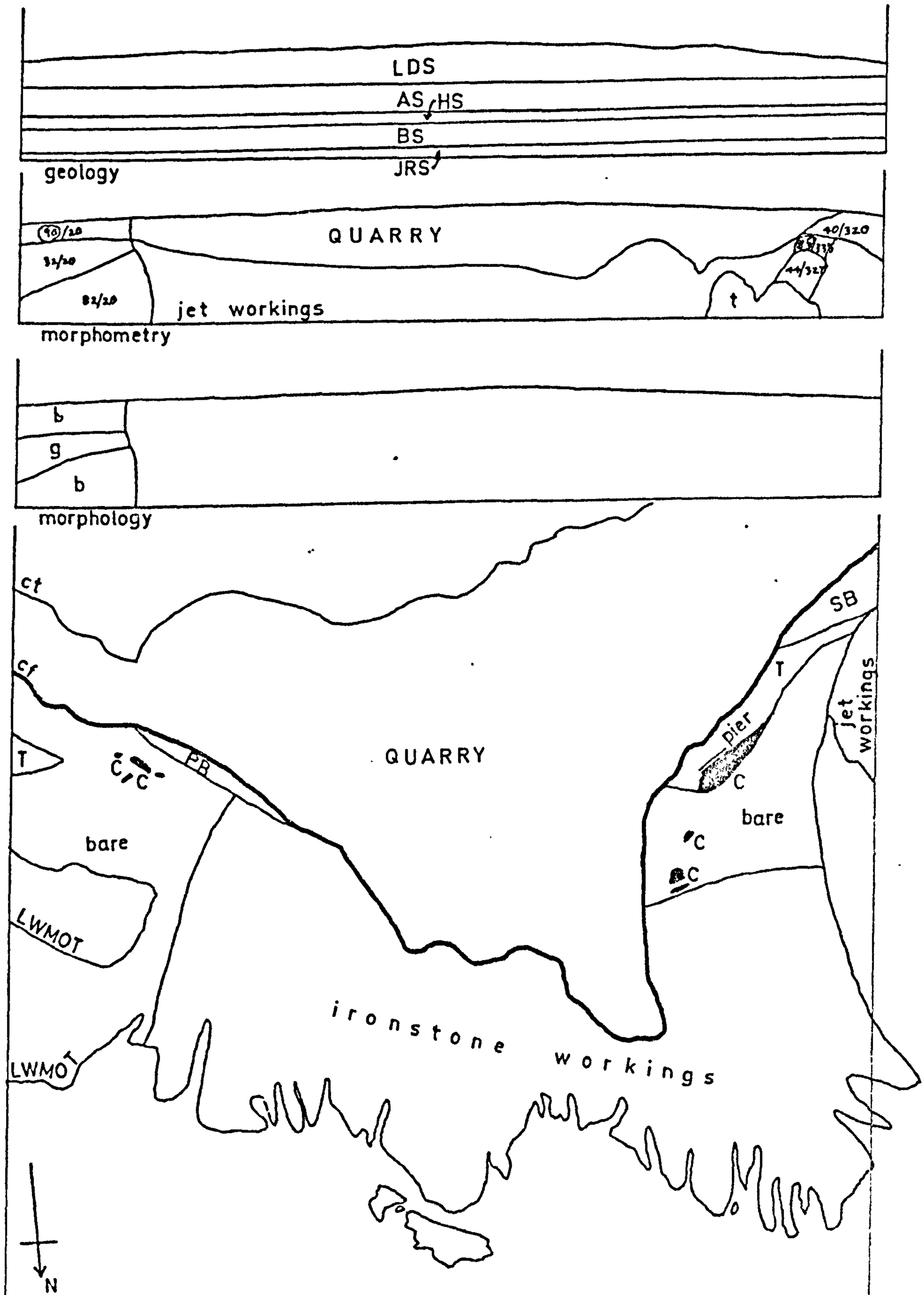
SHEET 17


LDS
AS
HS
BS
JRS
geology
90/60
90/80
44/70
35/53
t
63/33
60/80
90/10
t
94/30
97/80
jet workings
morphometry
bg
t
g
b
b
t
morphology
railway
cf
C
bare
PB
bare
Pr
C
T
S
T
C
T
cf
PB
T
M
LWMOT
N

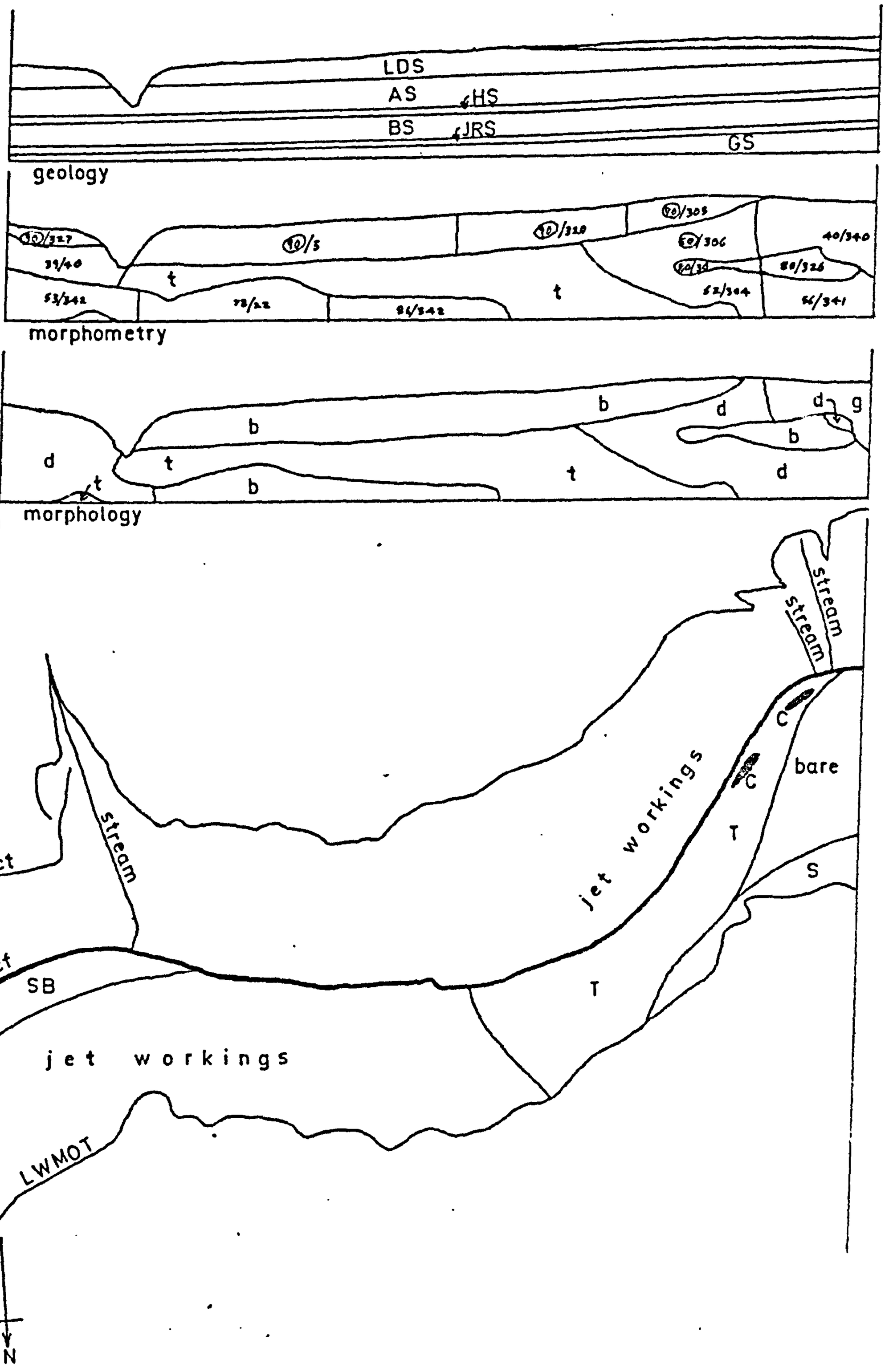
SHEET 18


LDS
AS
HS
BS
JRS
geology
90/53
90/80
90/52
42/53
36/52
36/80
90/76
t
68/32
morphometry
b
g
d
dg
b
jet
t
b
workings
morphology
see sheet 19
ct
cf
bare
Pr
T
LWMOT
LWMOT
bare
N

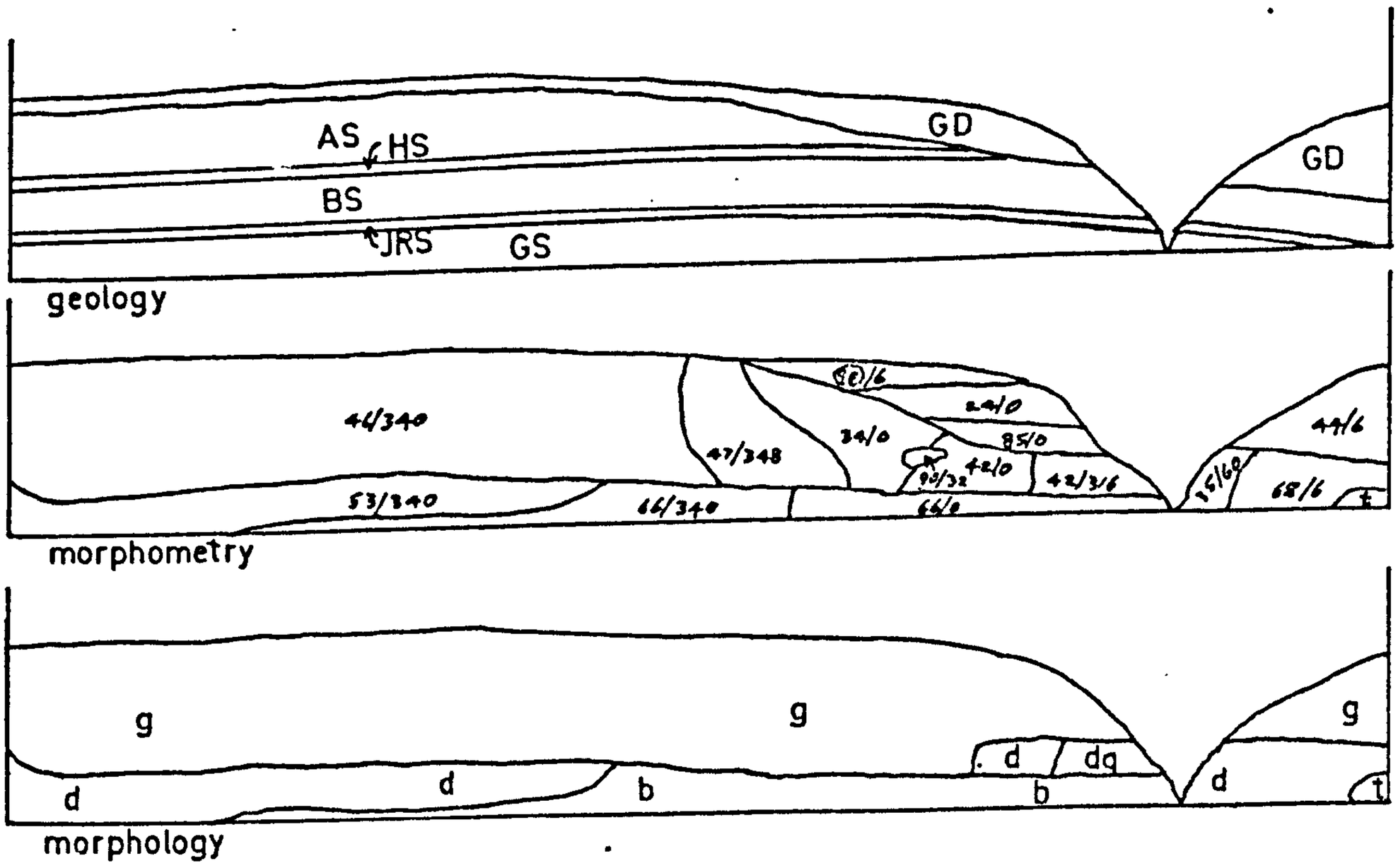
SHEET 19


LDS
AS/HS
BS
JRS
geology
QUARRY
jet workings
morphometry
b
g
b
morphology
ct
cf
T
C
C
PB
bare
LWMOT
QUARRY
ironstone workings
LWMOT
SB
T
pier
C
bare
C
C
jet workings
N

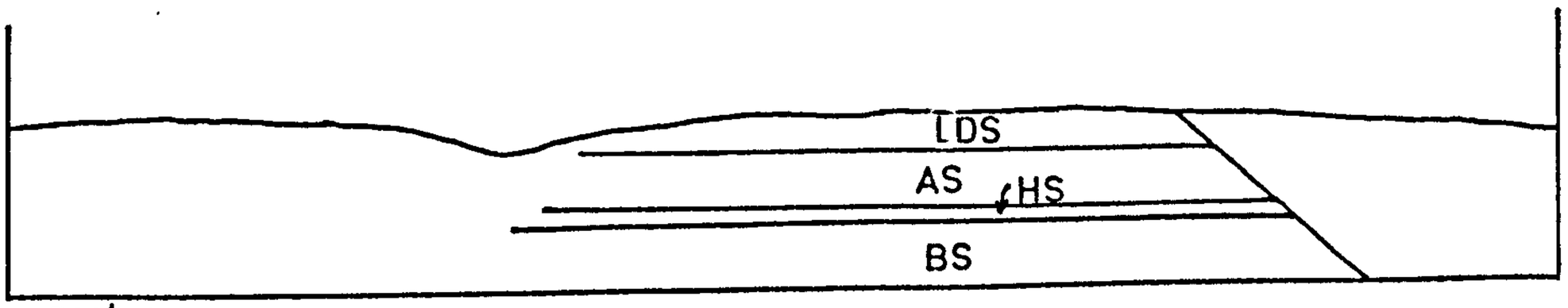
SHEET 20


LDS
AS
HS
BS
JRS
GS
geology
10/327
10/5
10/320
10/305
10/306
40/340
32/40
80/326
53/342
78/22
84/342
52/304
56/341
morphometry
b
d
g
t
morphology
stream
stream
jet workings
jet workings
C
C
bare
ct
ct
SB
T
T
S
LWMOT
N

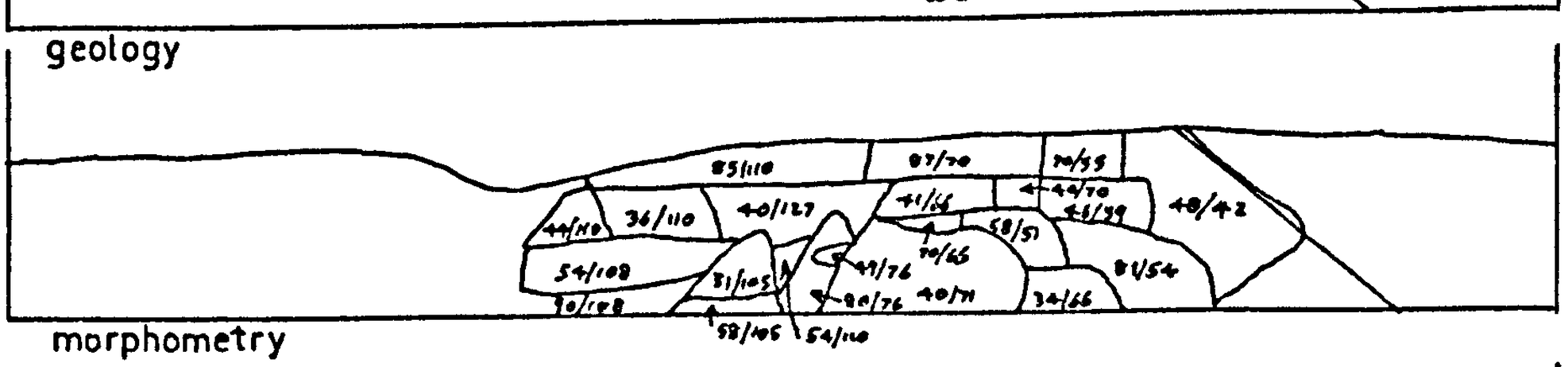
SHEET 21


AS
HS
BS
JRS
GS
GD
GD
geology
44/340
47/348
34/0
85/0
42/0
42/3/6
44/6
68/6
53/340
66/340
morphometry
g
g
g
d
d
b
b
d
dq
d
t
morphology
ct
stream
stream
jet workings
S
T
SB
S
cf
bare
S
LWMOT
N

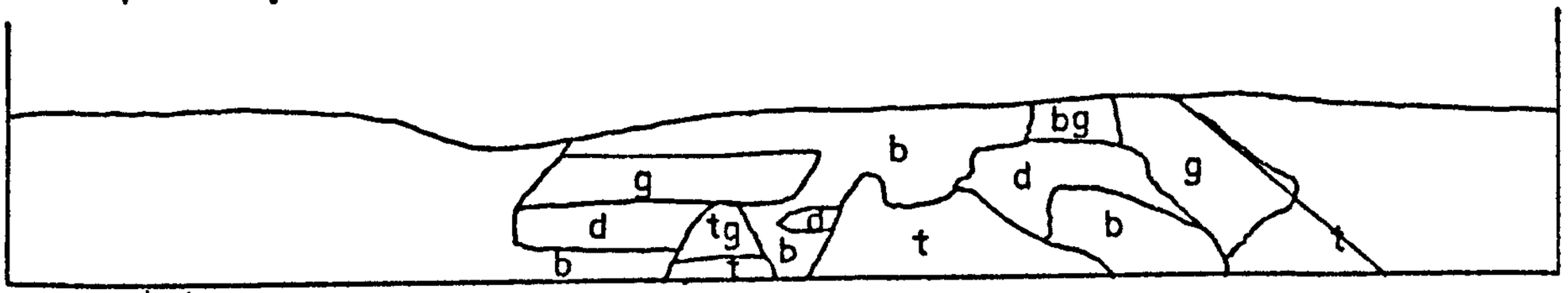
SHEET 22



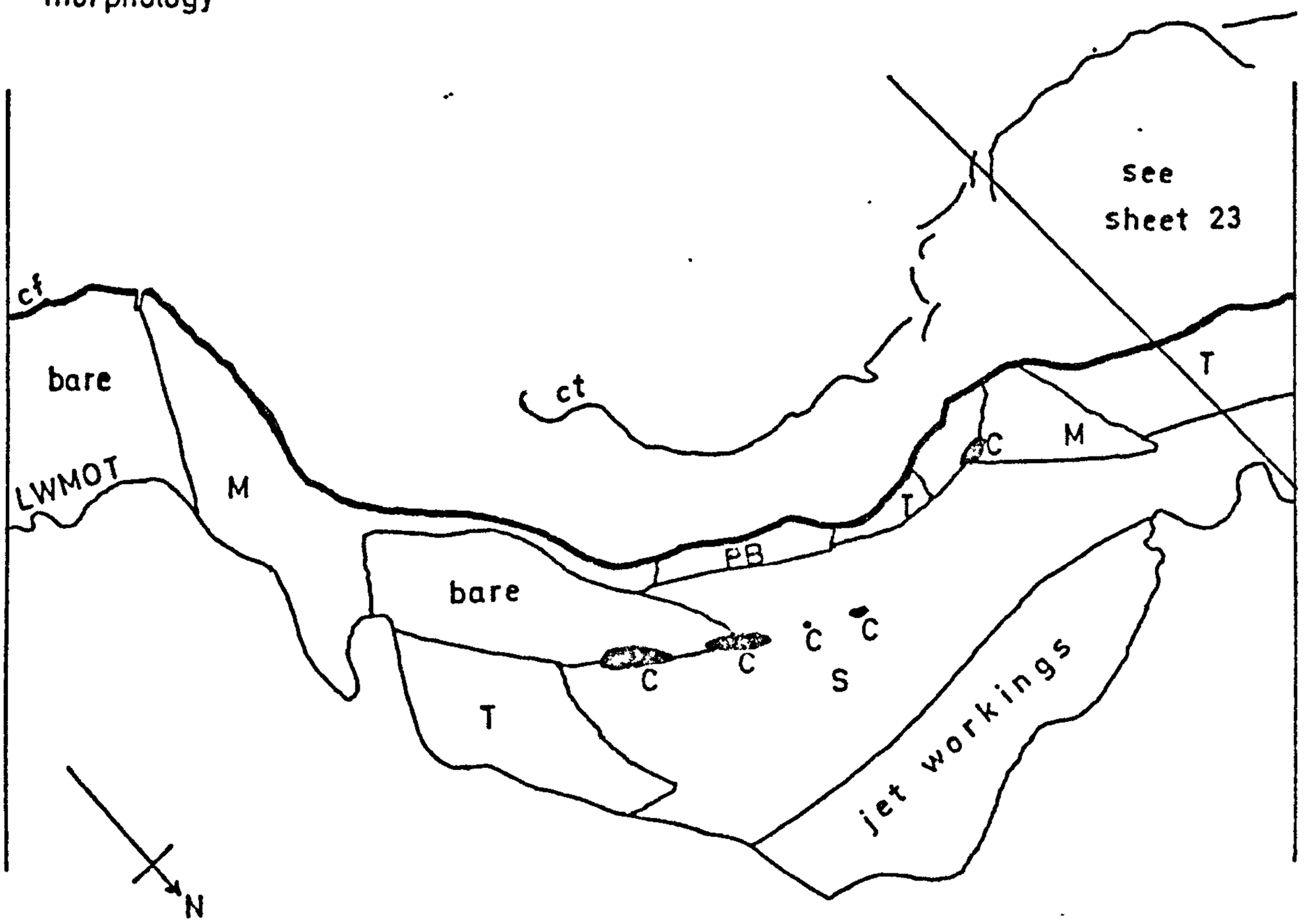
geology



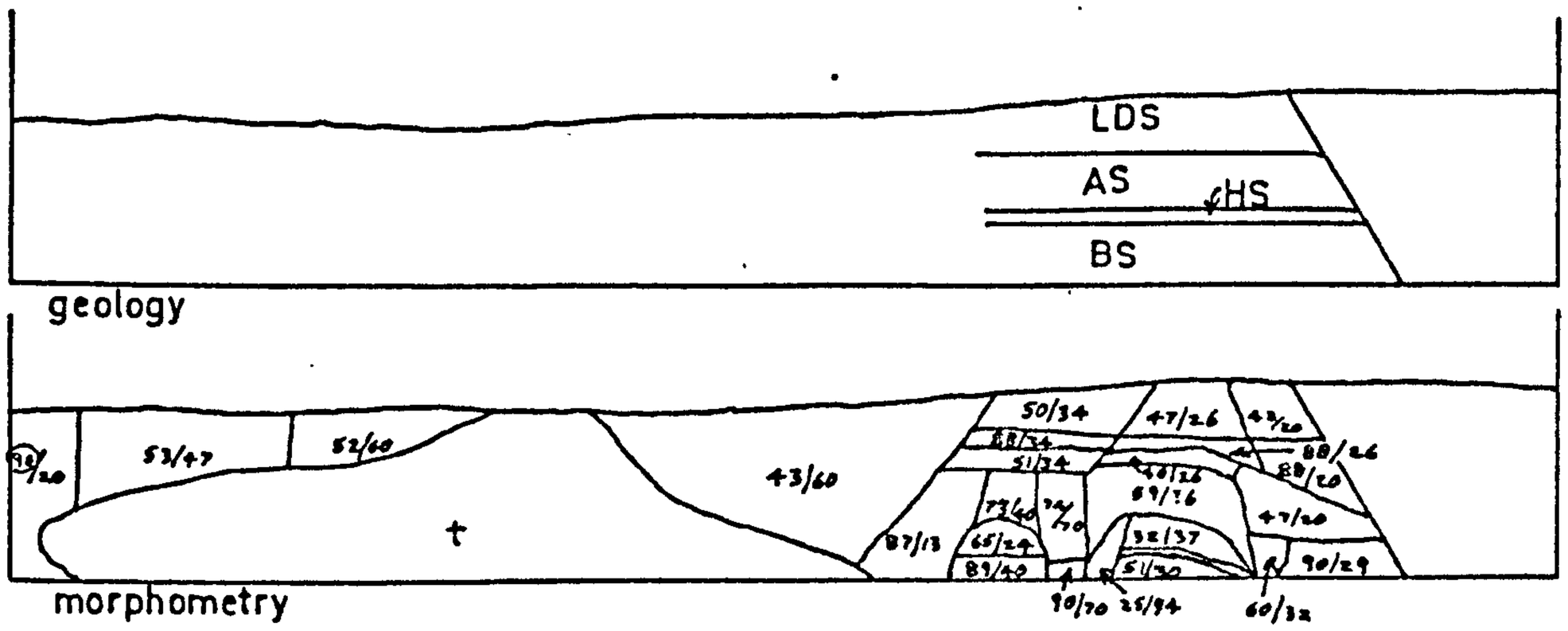
morphometry

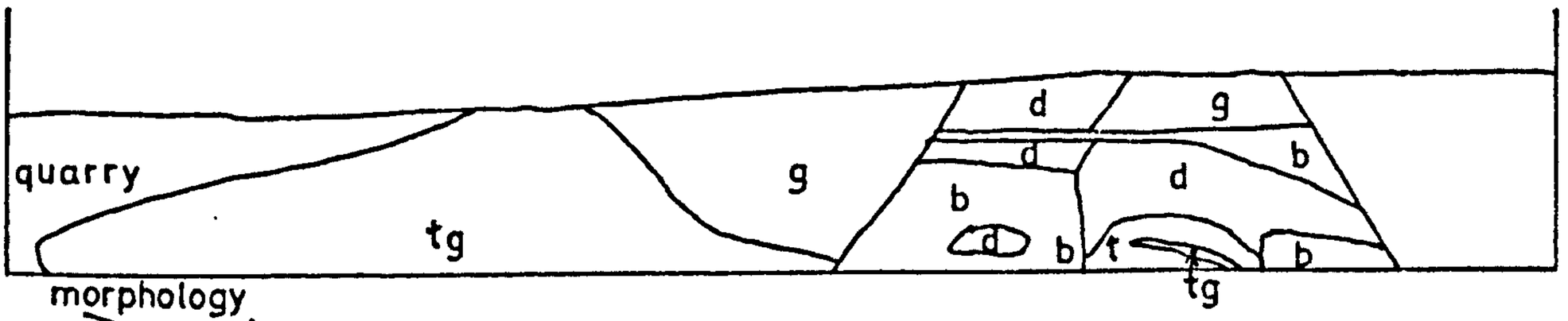


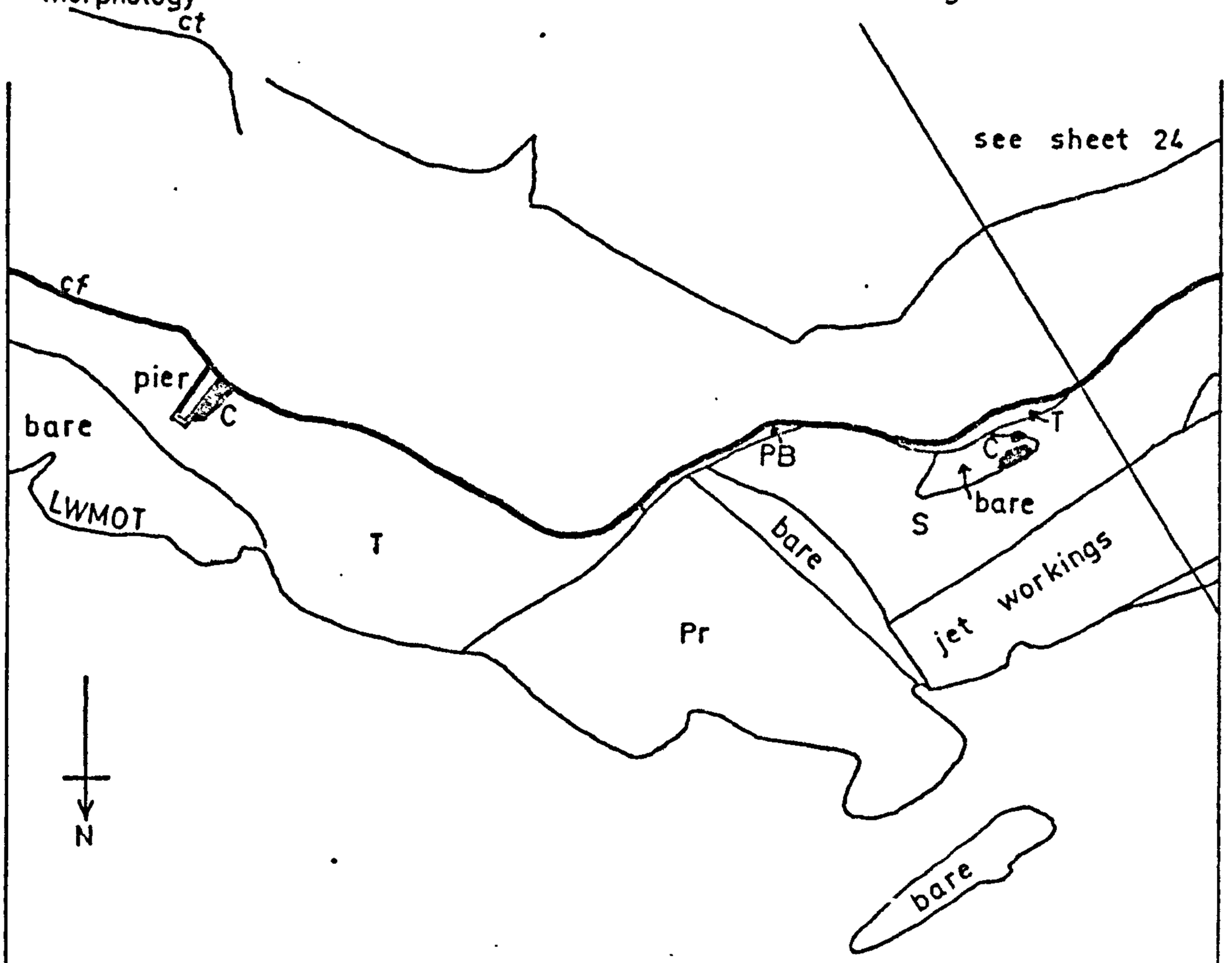
morphology



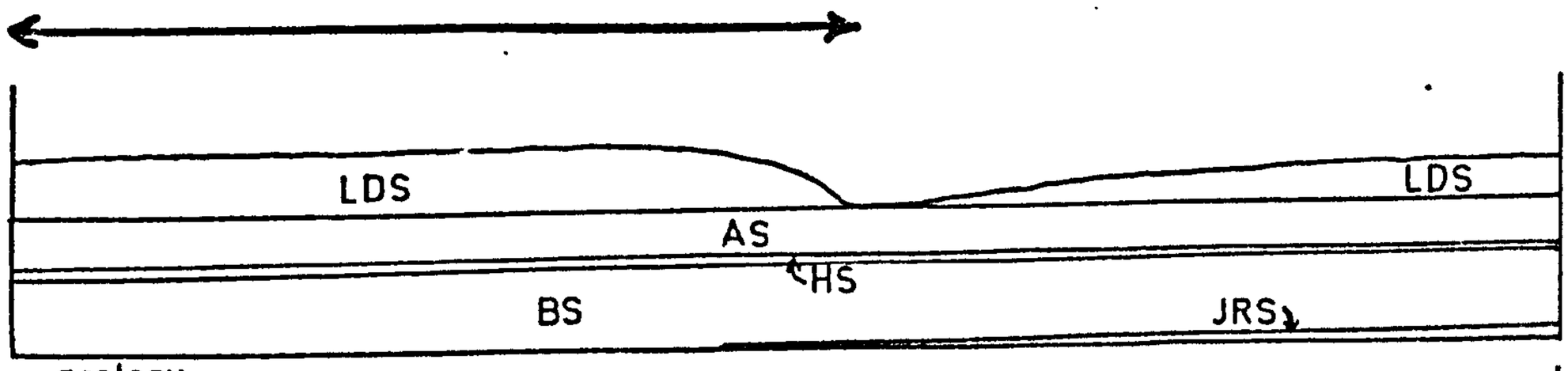
SHEET 23


LDS
AS
HS
BS
geology
53/47
52/60
43/60
50/34
47/26
t
morphometry
90/70
25/94
60/32

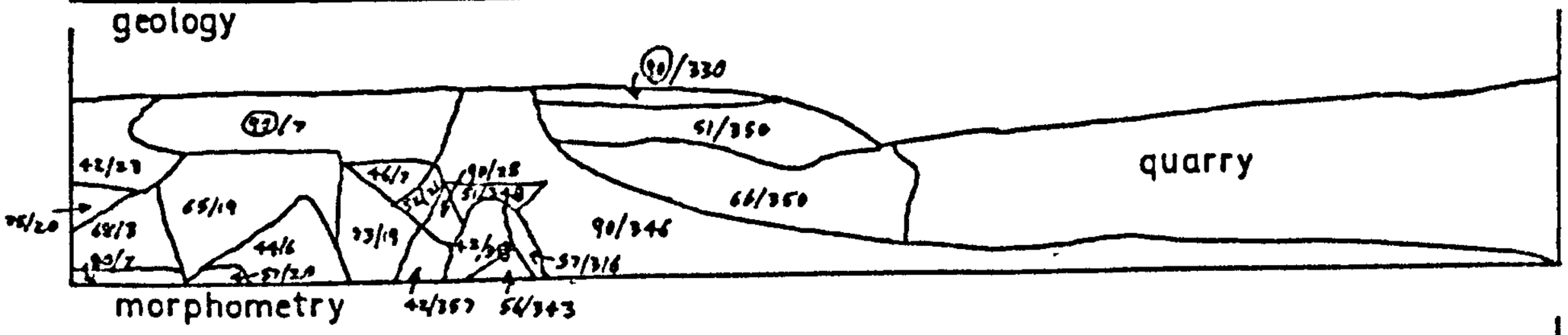

quarry
tg
g
d
b
t
morphology


ct
cf
pier
C
bare
LWMOT
T
Pr
PB
S
bare
jet workings
see sheet 24
N

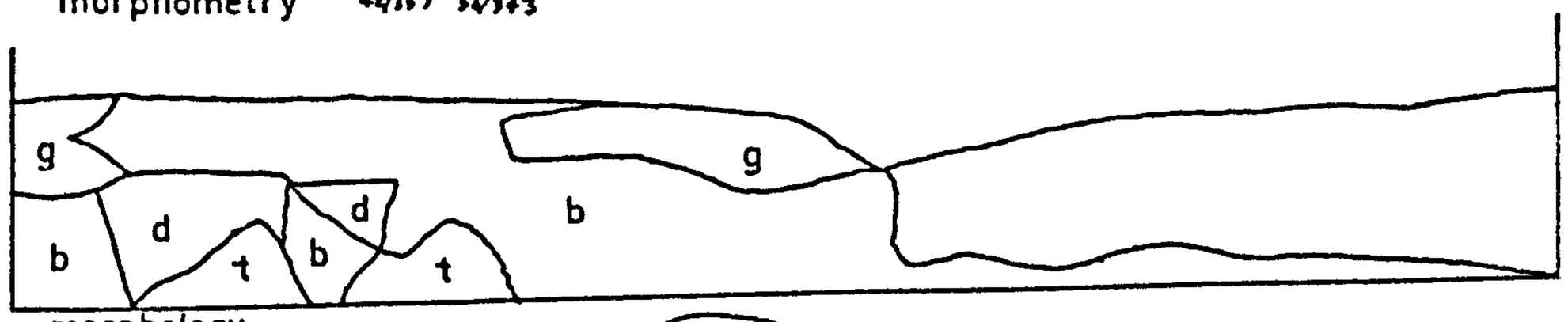
SHEET 24



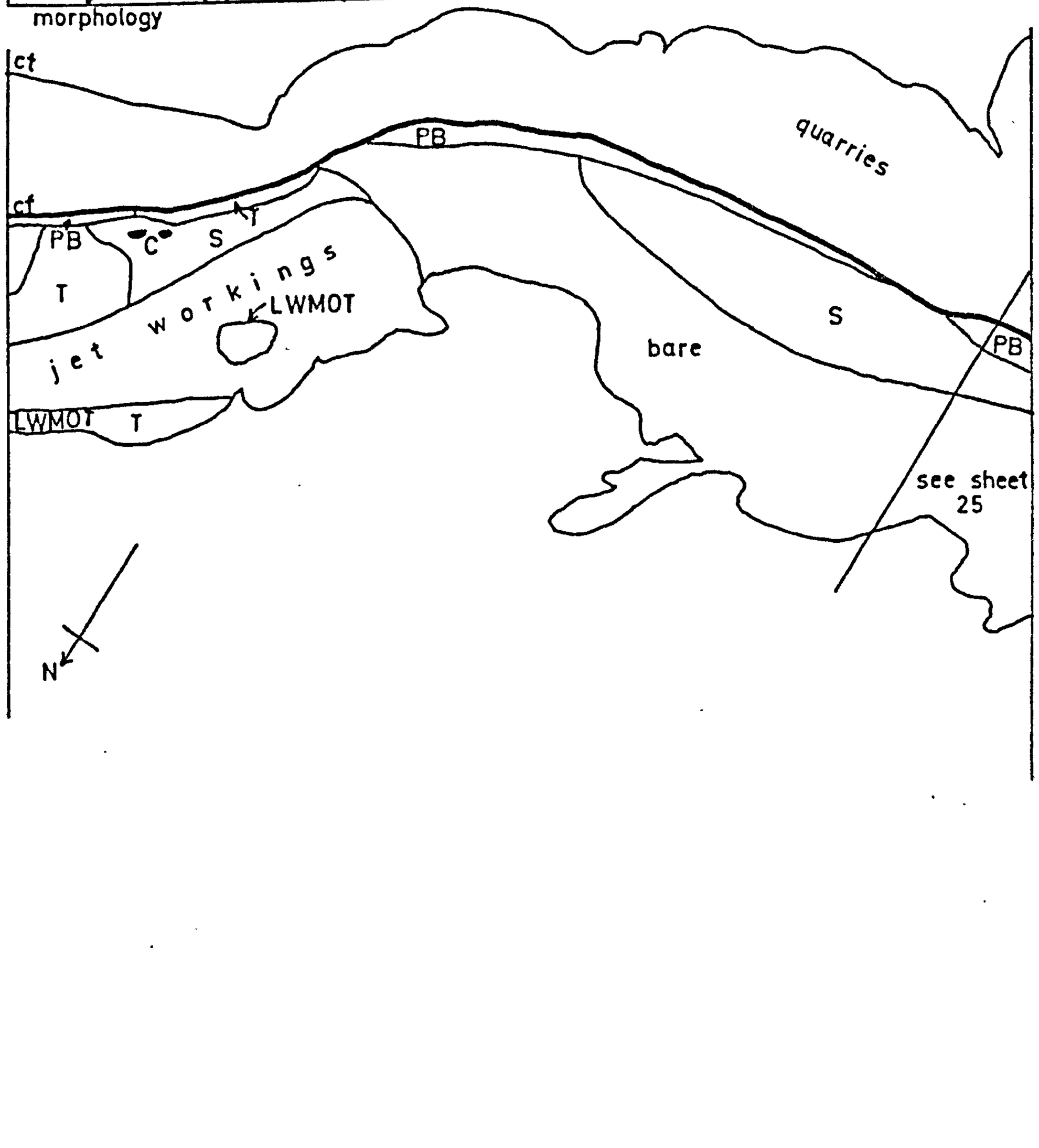
geology



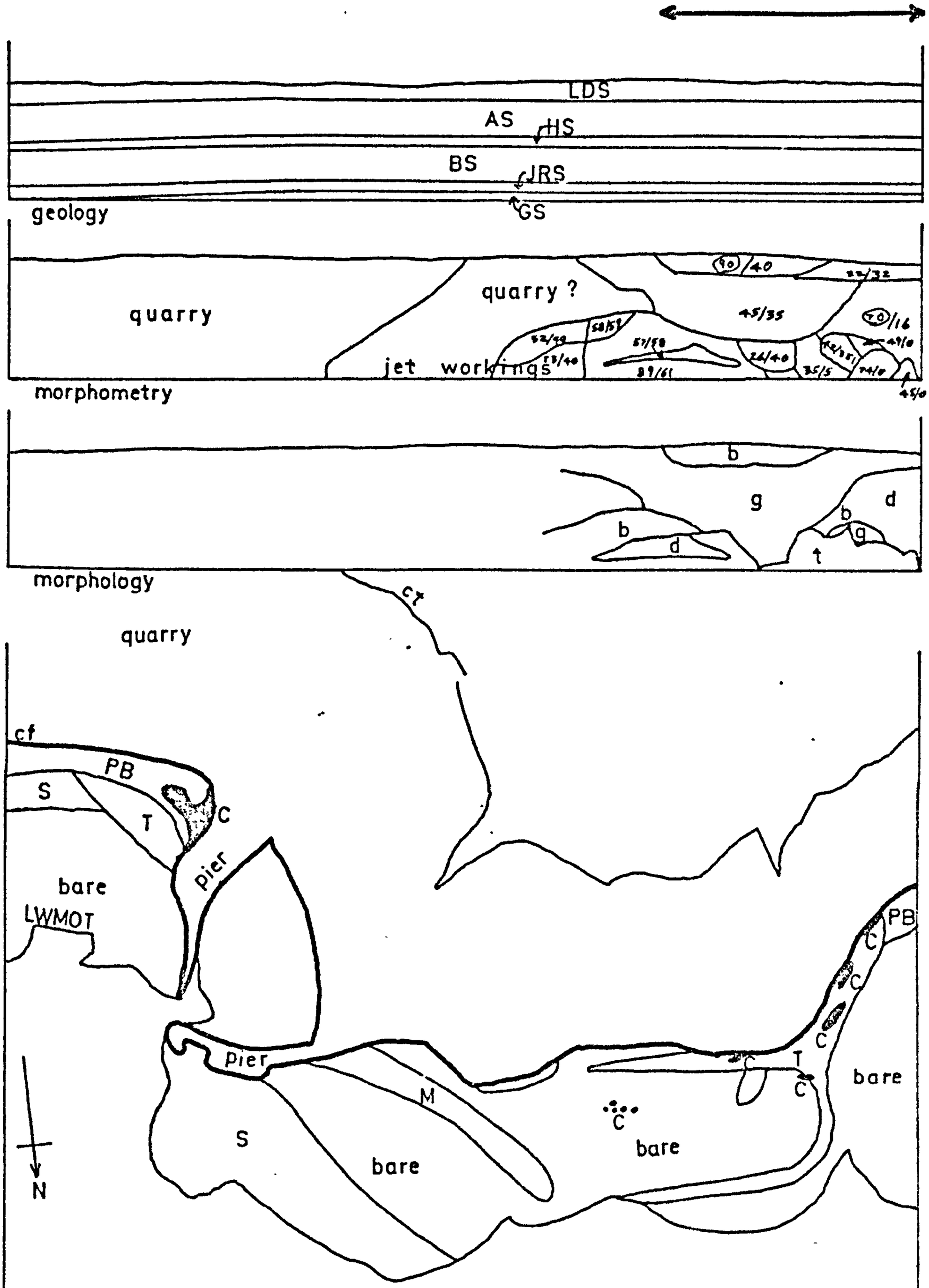
morphometry



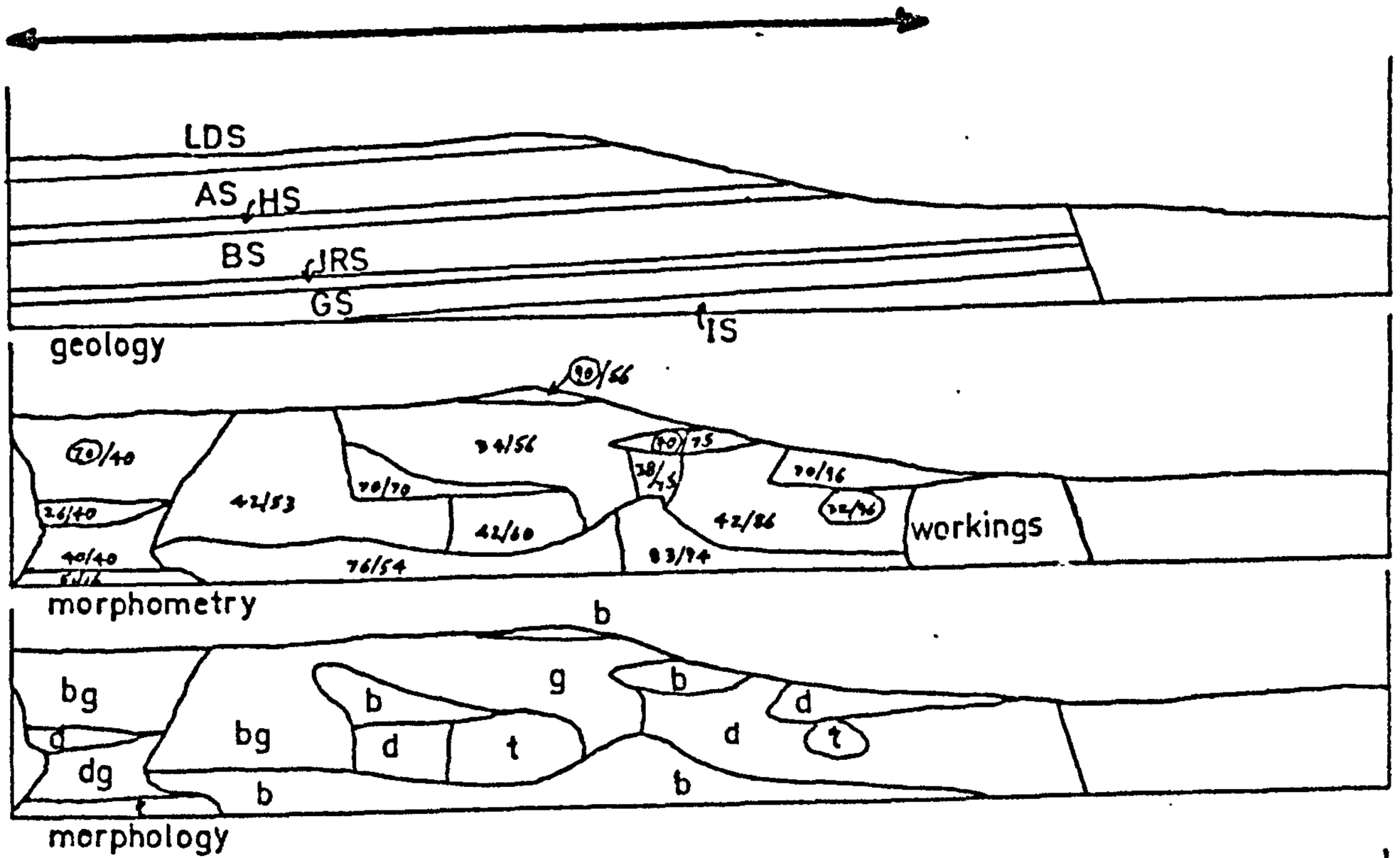
morphology

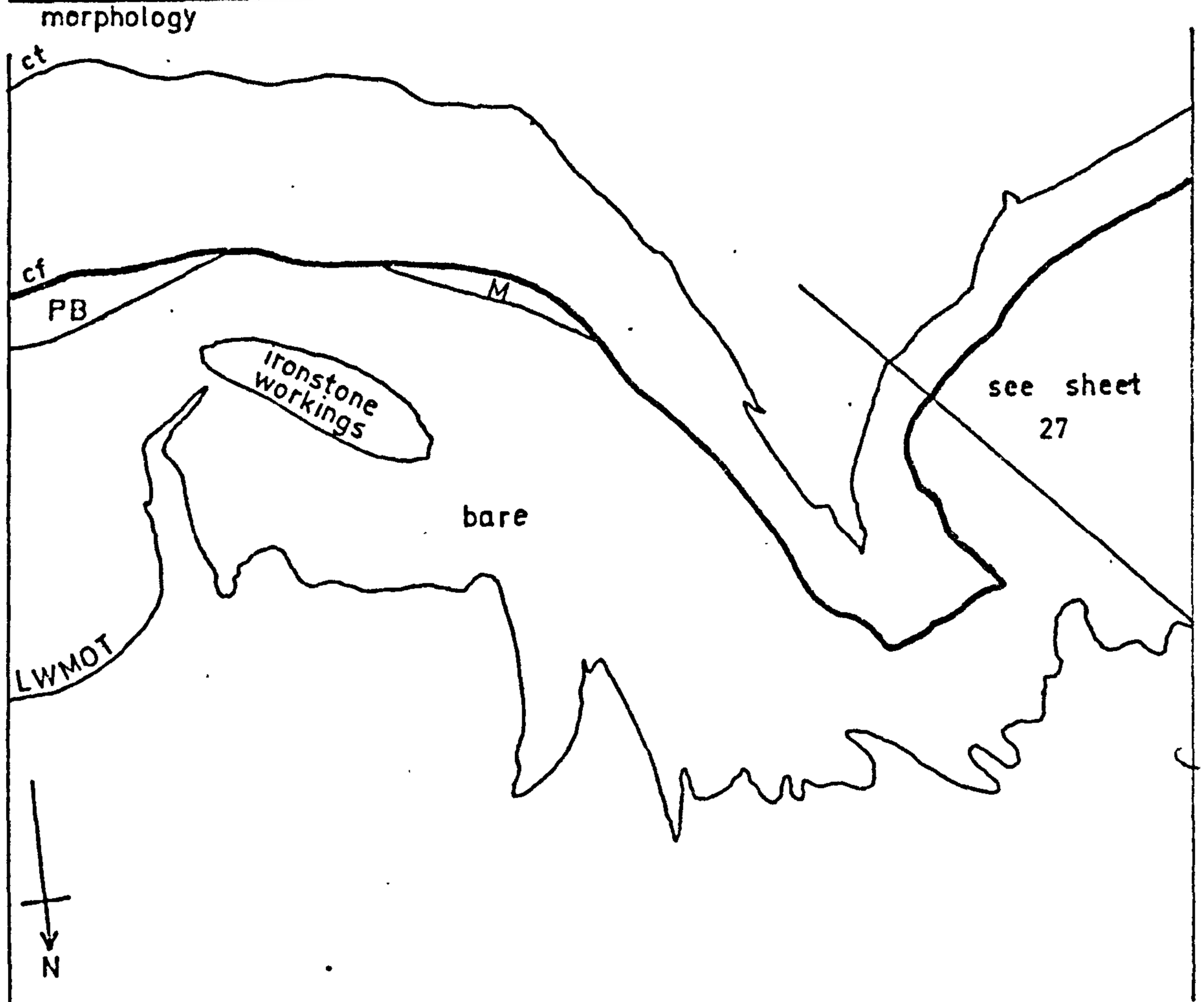


SHEET 25

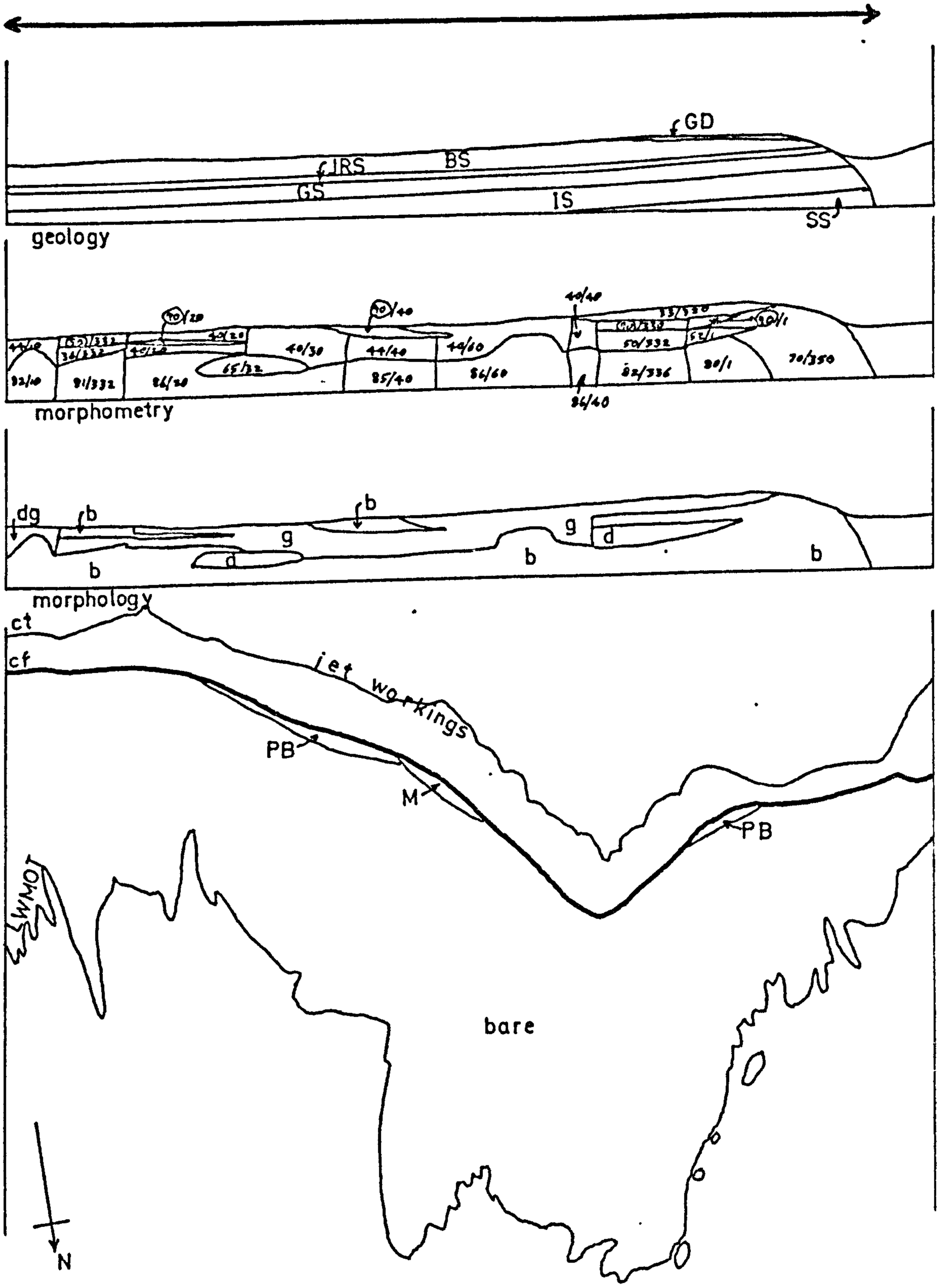

LDS
AS
HS
BS
JRS
GS
geology
quarry
quarry ?
jet workings
90/40
45/35
90/16
49/0
45/0
b
g
d
t
morphometry
morphology
quarry
cf
PB
S
T
C
pier
bare
LWMOT
M
N
PB
C
T
bare

SHEET 26

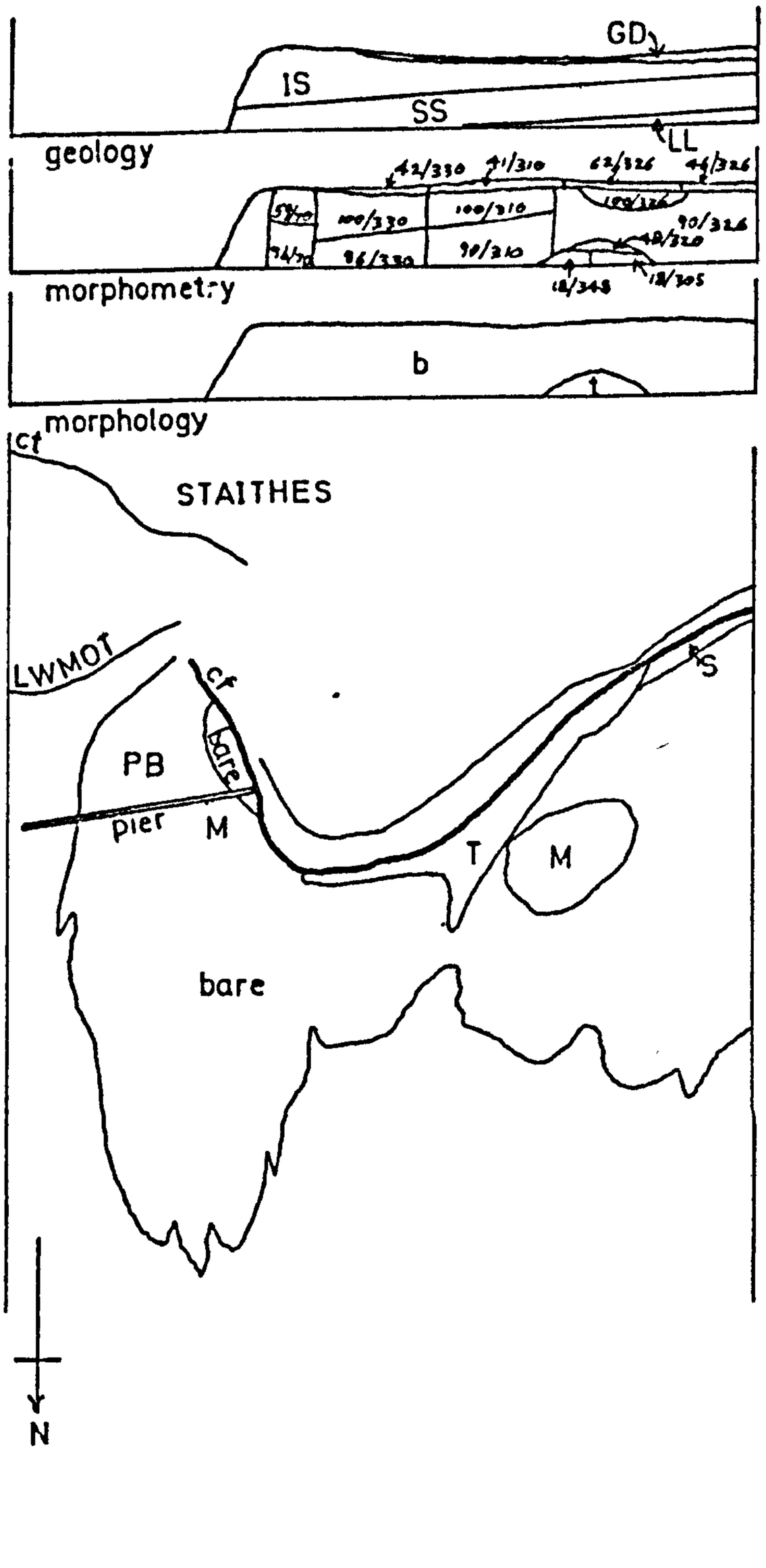

LDS
AS
HS
BS
IRS
GS
IS
geology
90/66
70/40
34/56
70 75
38/45
70/96
26/40
42/53
70/70
42/60
42/86
workings
40/40
76/54
83/94
morphometry
b
bg
g
b
d
bg
d
t
d
t
dg
b
b
morphology


ct
cf
PB
M
ironstone workings
see sheet 27
bare
LWMOT
N

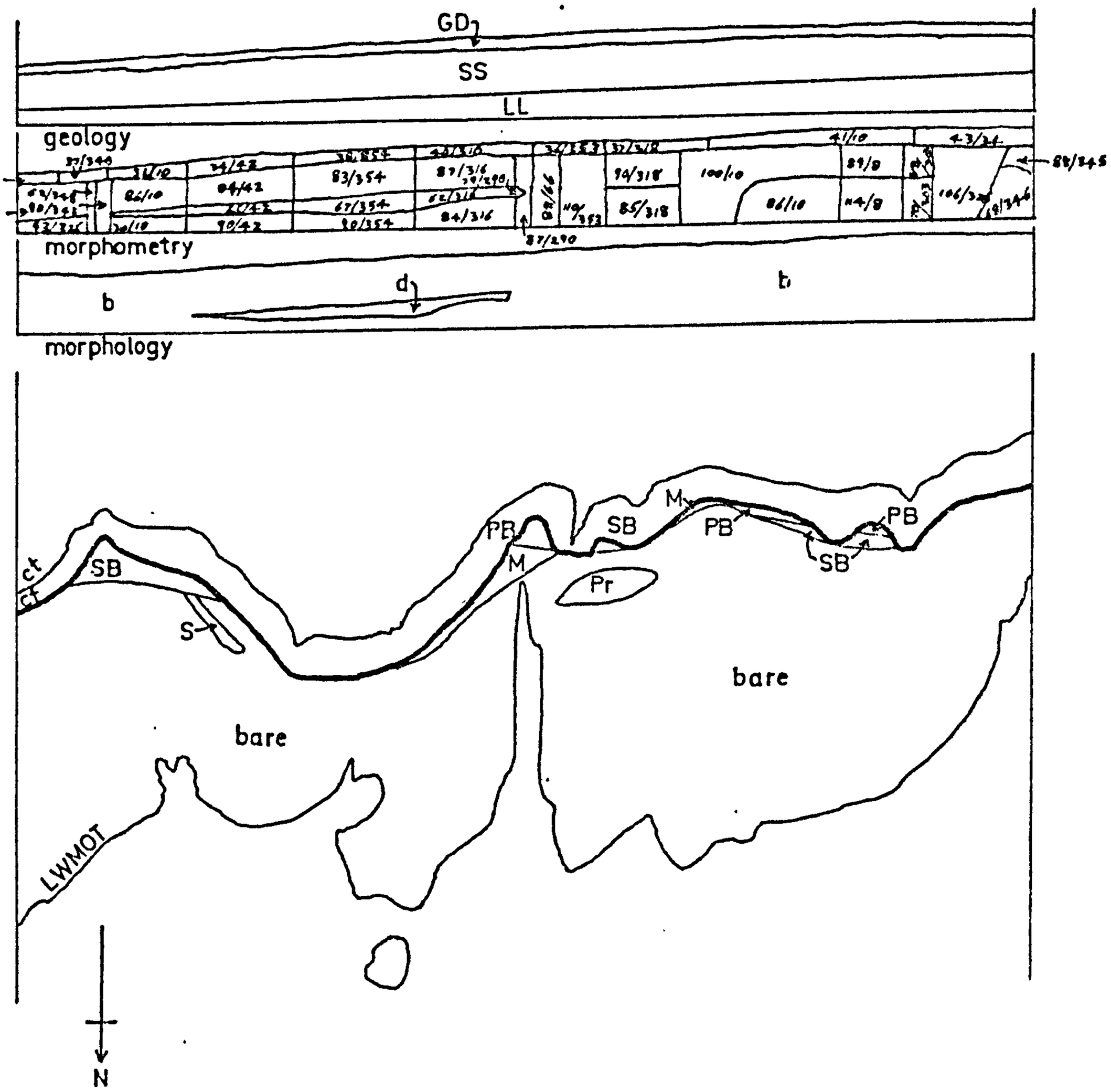
SHEET 27


GD
IRS
BS
GS
IS
SS
geology
morphometry
dg
b
g
d
morphology
ct
cf
jet workings
PB
M
SWMOT
bare
N

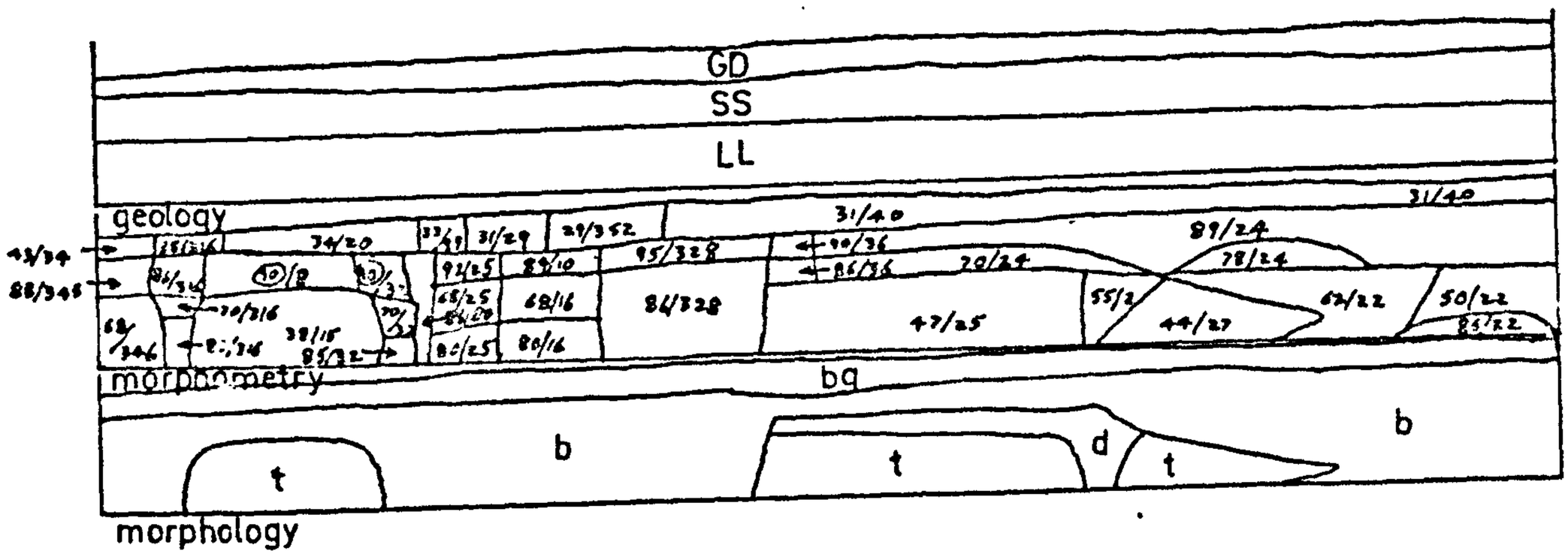
SHEET 28

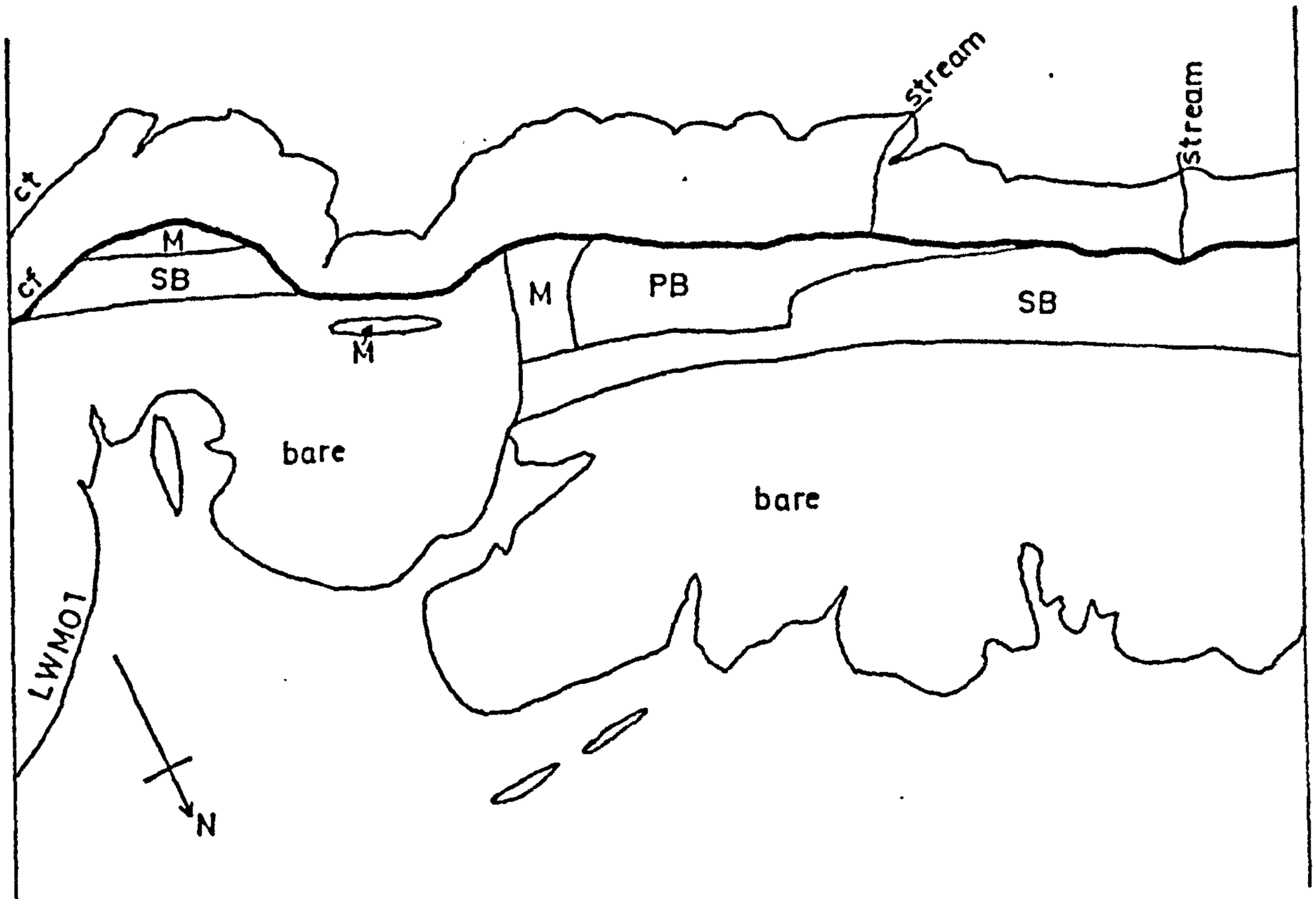

GD
IS
SS
LL
geology
42/330
31/310
62/326
46/326
100/330
100/310
90/326
96/330
90/310
18/348
18/305
morphometry
b
morphology
ct
STAITHES
LWMOT
cf
bare
PB
pier
M
T
M
S
bare
N

SHEET 29

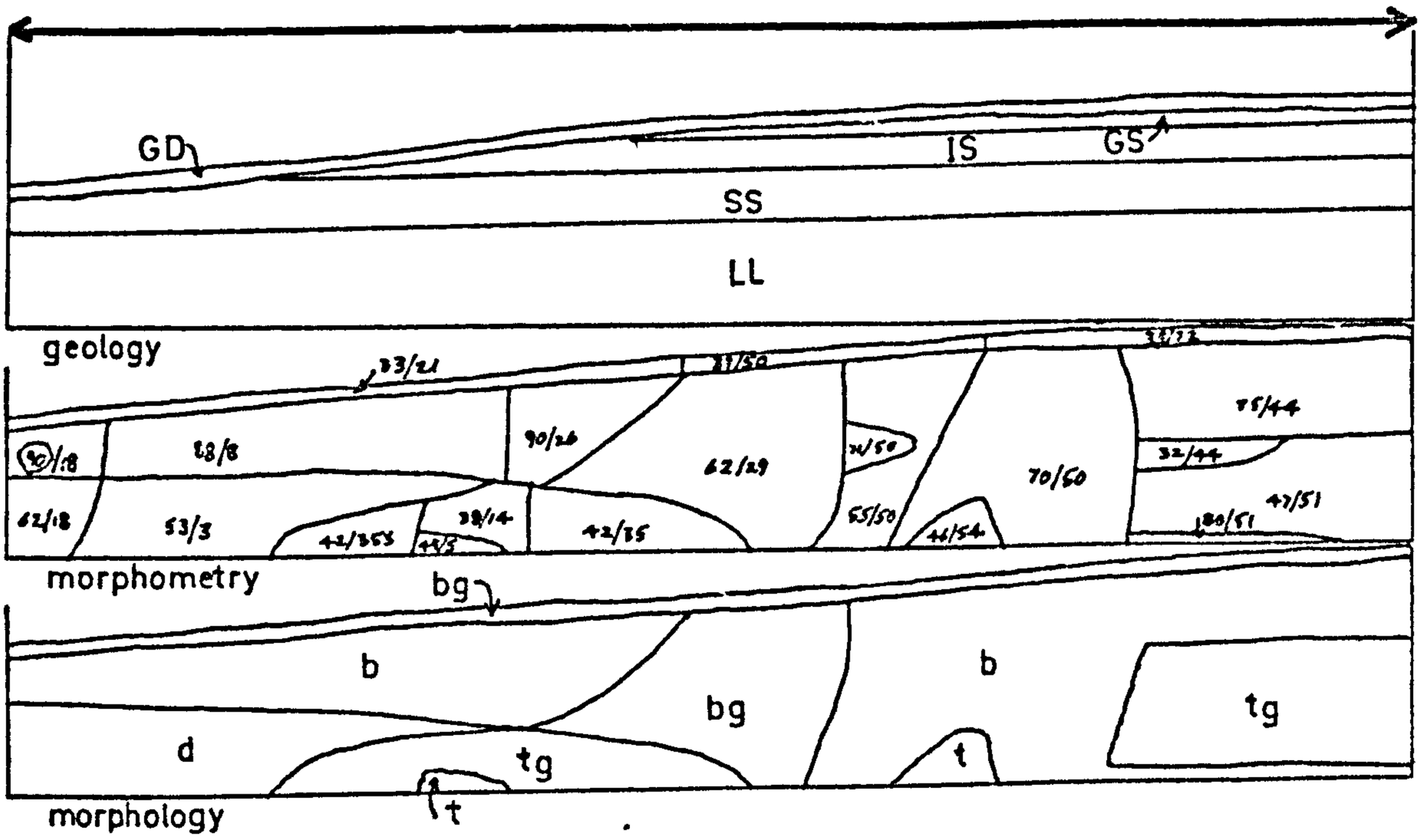

GD
SS
LL
geology
morphometry
b
d
b
morphology
PB
SB
M
PB
SB
M
PB
SB
Pr
ct
ct
S
bare
bare
LWMOT
N

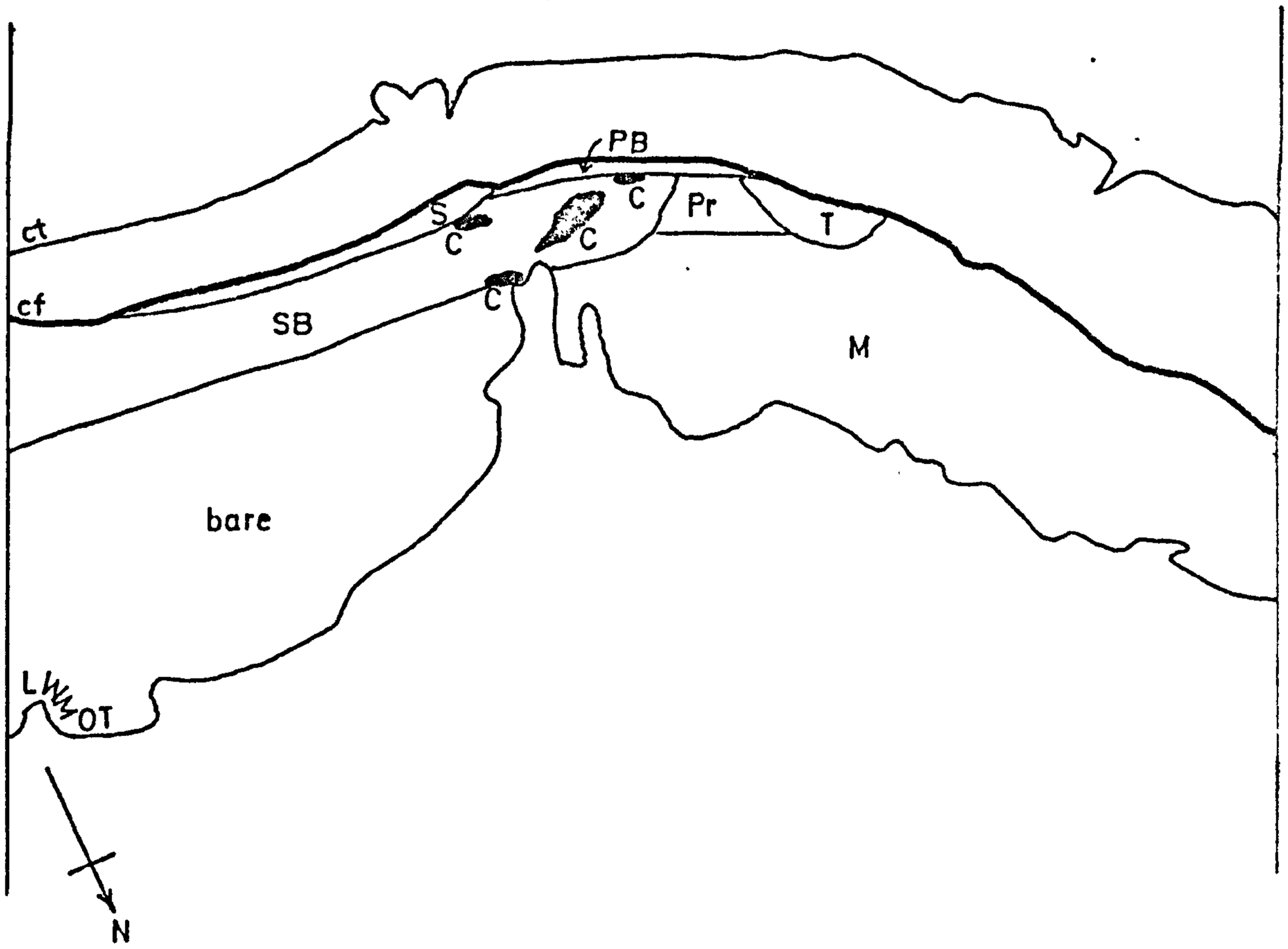
SHEET 30


GD
SS
LL
geology
31/40
89/24
78/24
95/328
84/328
47/25
44/27
62/22
50/22
morphometry
bg
b
t
d
morphology

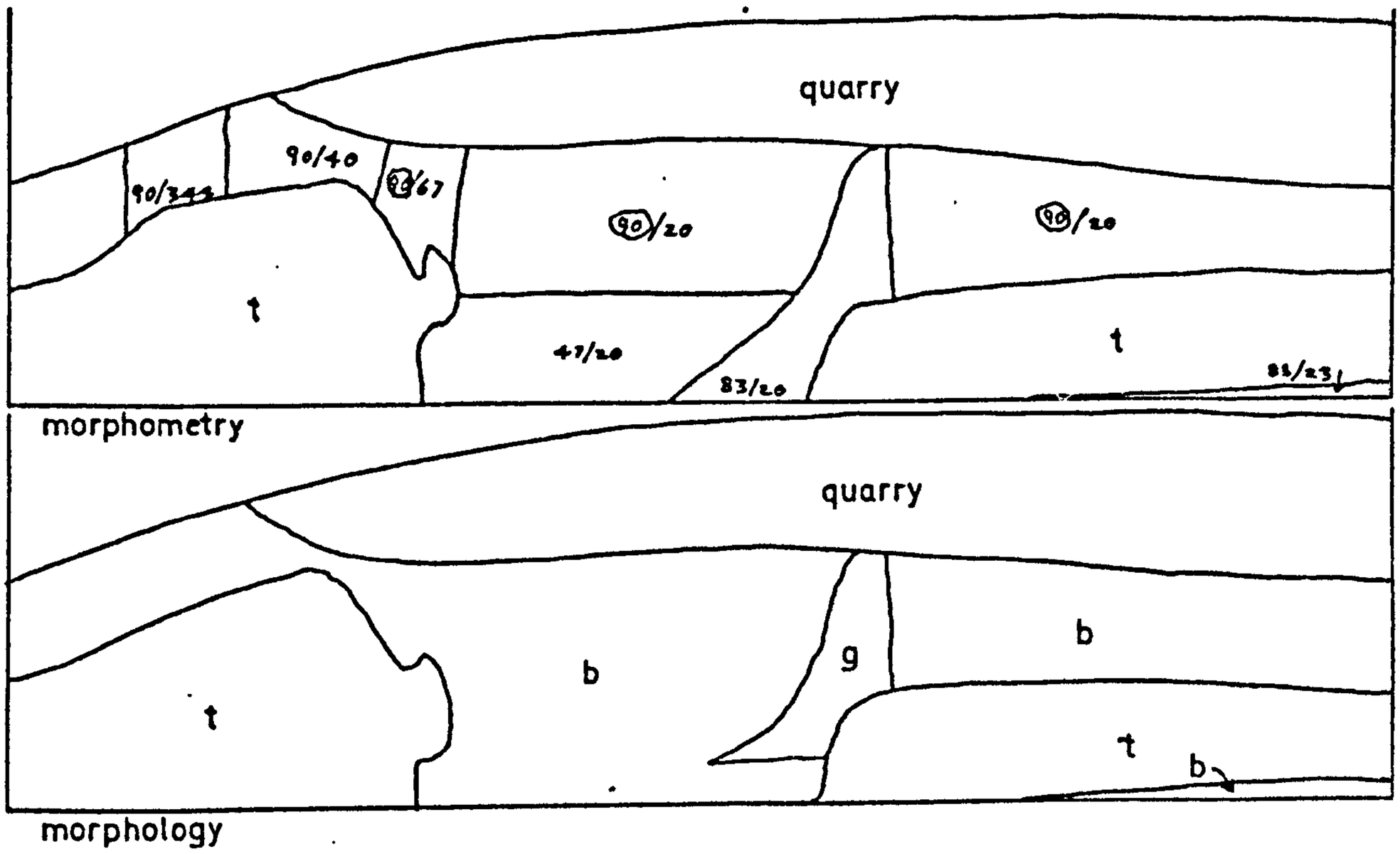

stream
stream
cr
cr
M
SB
M
M
PB
SB
bare
bare
LWM01
N

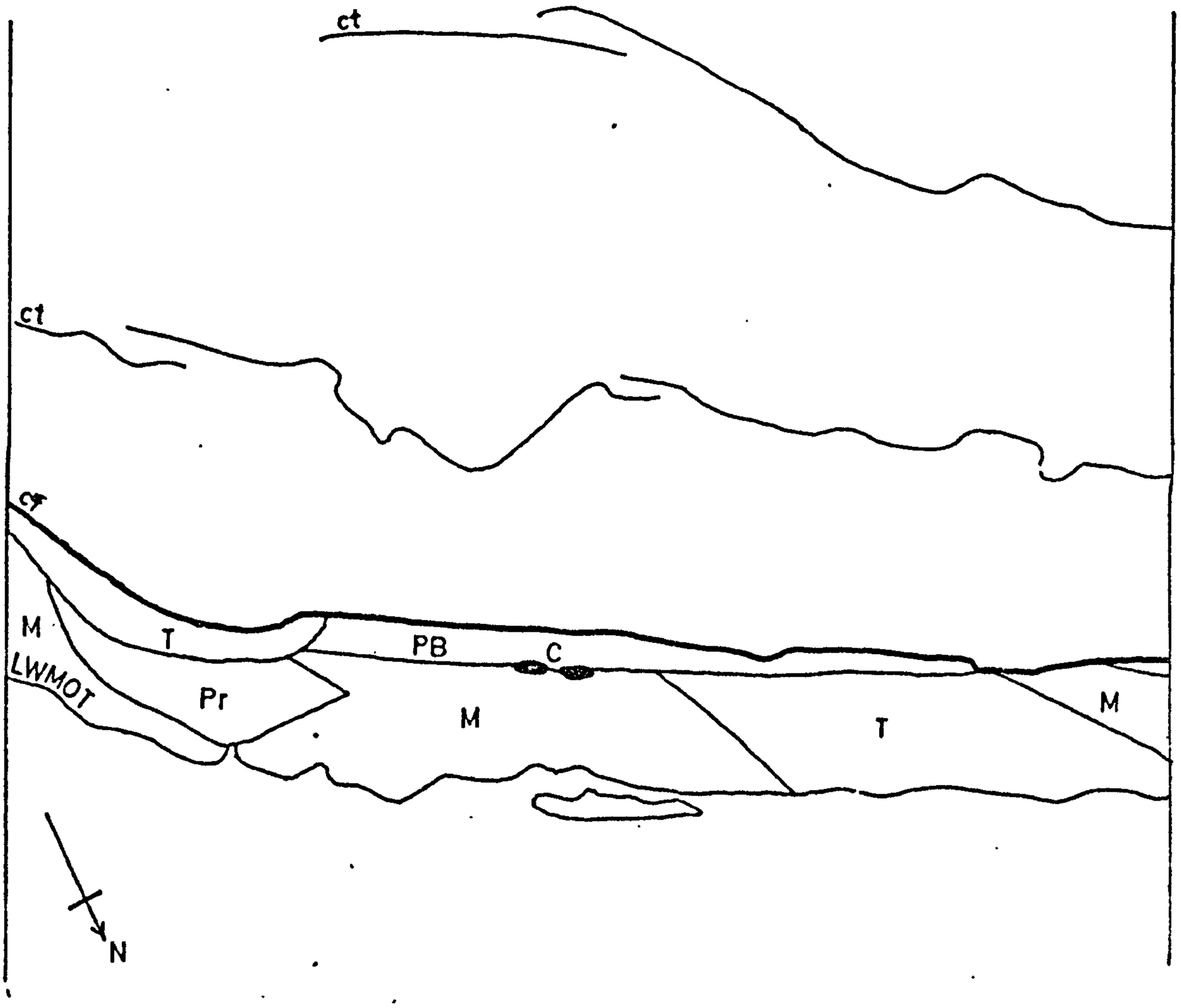
SHEET 31


GD
IS
GS
SS
LL
geology
33/21
33/50
90/26
62/29
70/50
75/44
32/44
47/51
80/51
88/8
62/18
53/3
42/35
46/54
bg
b
bg
d
tg
t
morphology

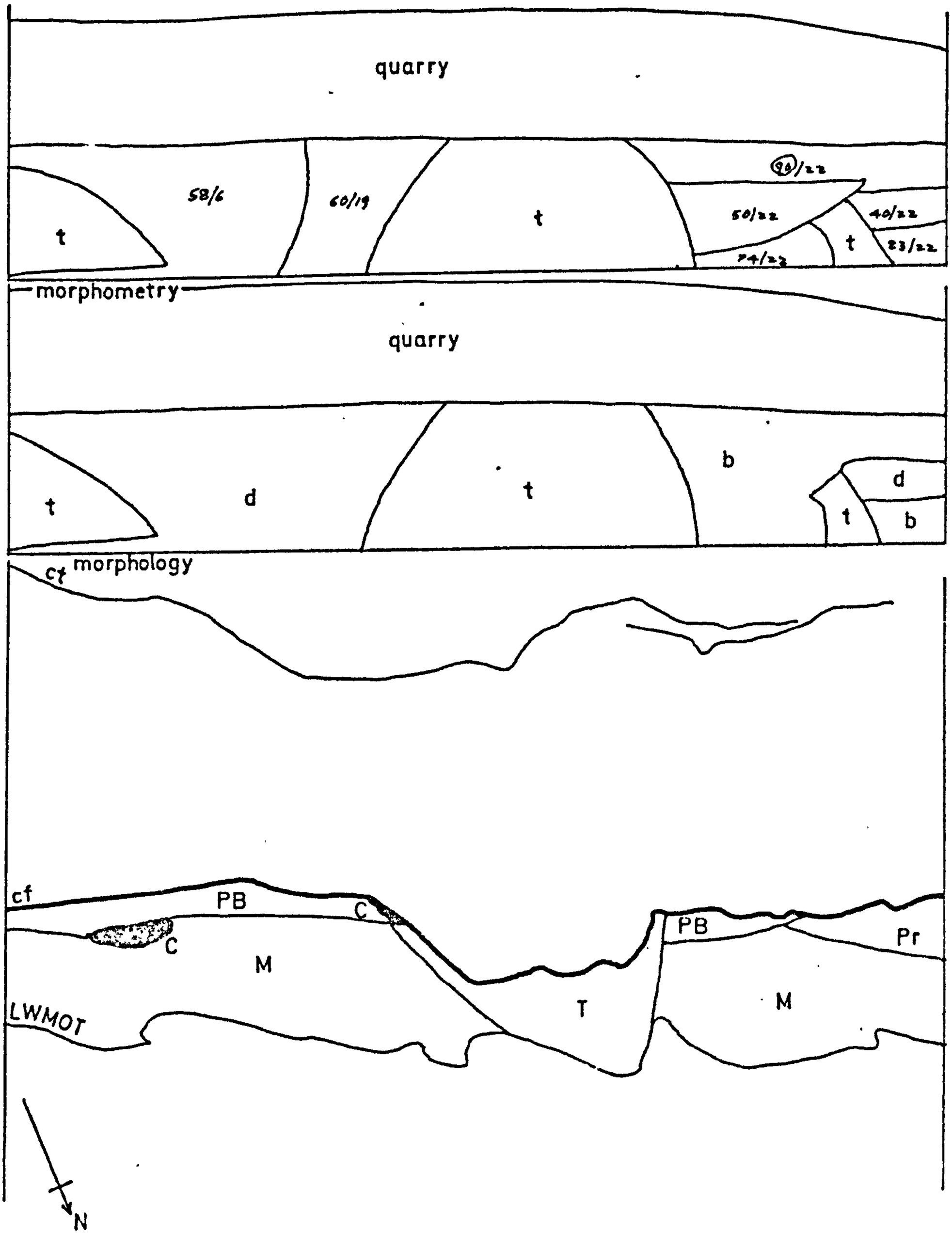

PB
C
Pr
T
S
ct
cf
SB
M
bare
OT
N

SHEET 32

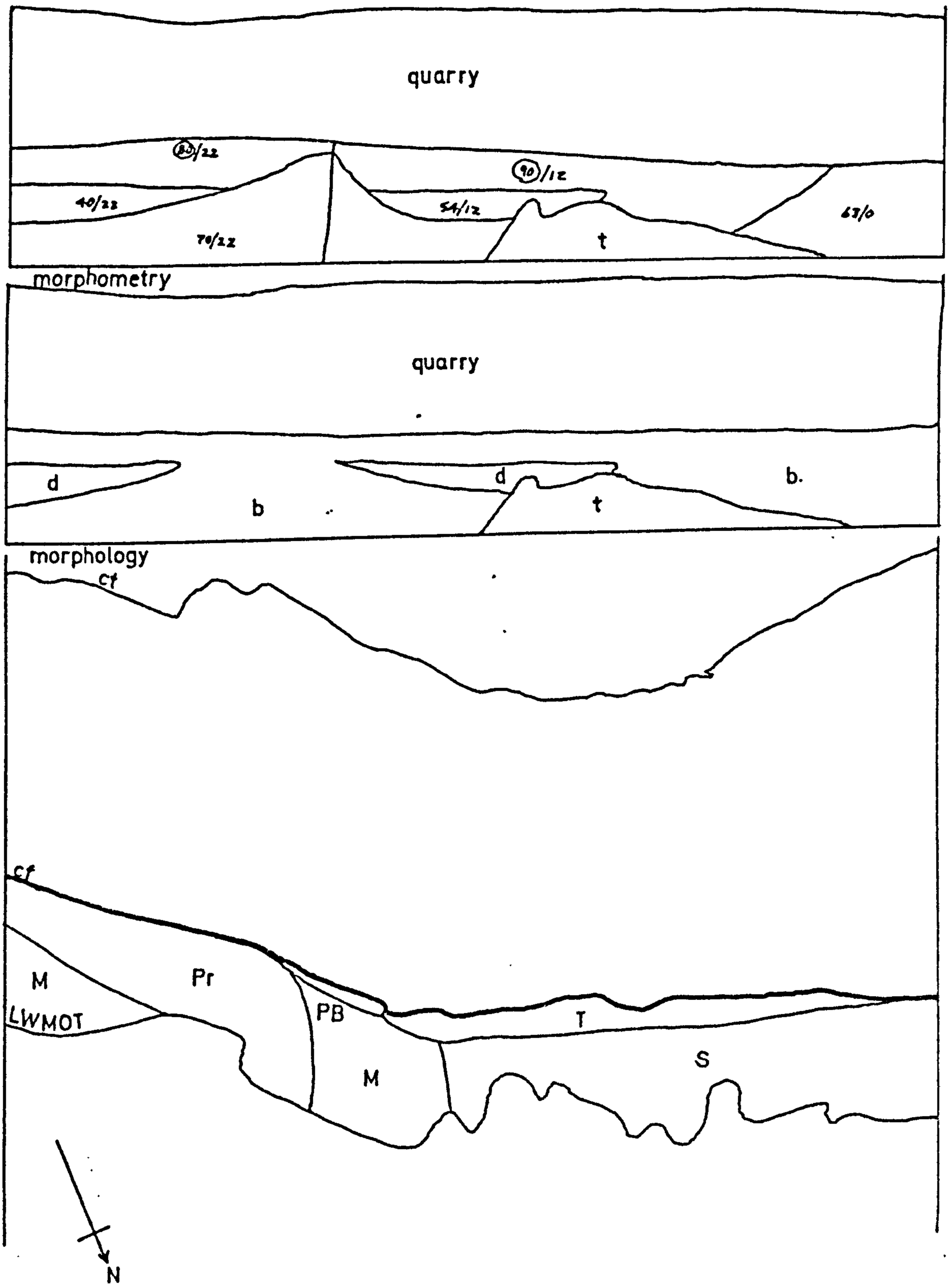

quarry
90/343
90/40
90/67
90/20
90/20
t
47/20
83/20
t
83/23
morphometry
quarry
t
b
g
b
t
t
b
morphology


ct
c1
cr
M
LWMOT
T
Pr
PB
C
M
T
M
N

SHEET 33


quarry
58/6
60/19
t
t
90/22
50/22
40/22
t
23/22
74/23
morphometry
quarry
t
d
t
b
d
t
b
ct morphology
cf
PB
C
C
M
T
PB
Pr
M
LWMOT
N

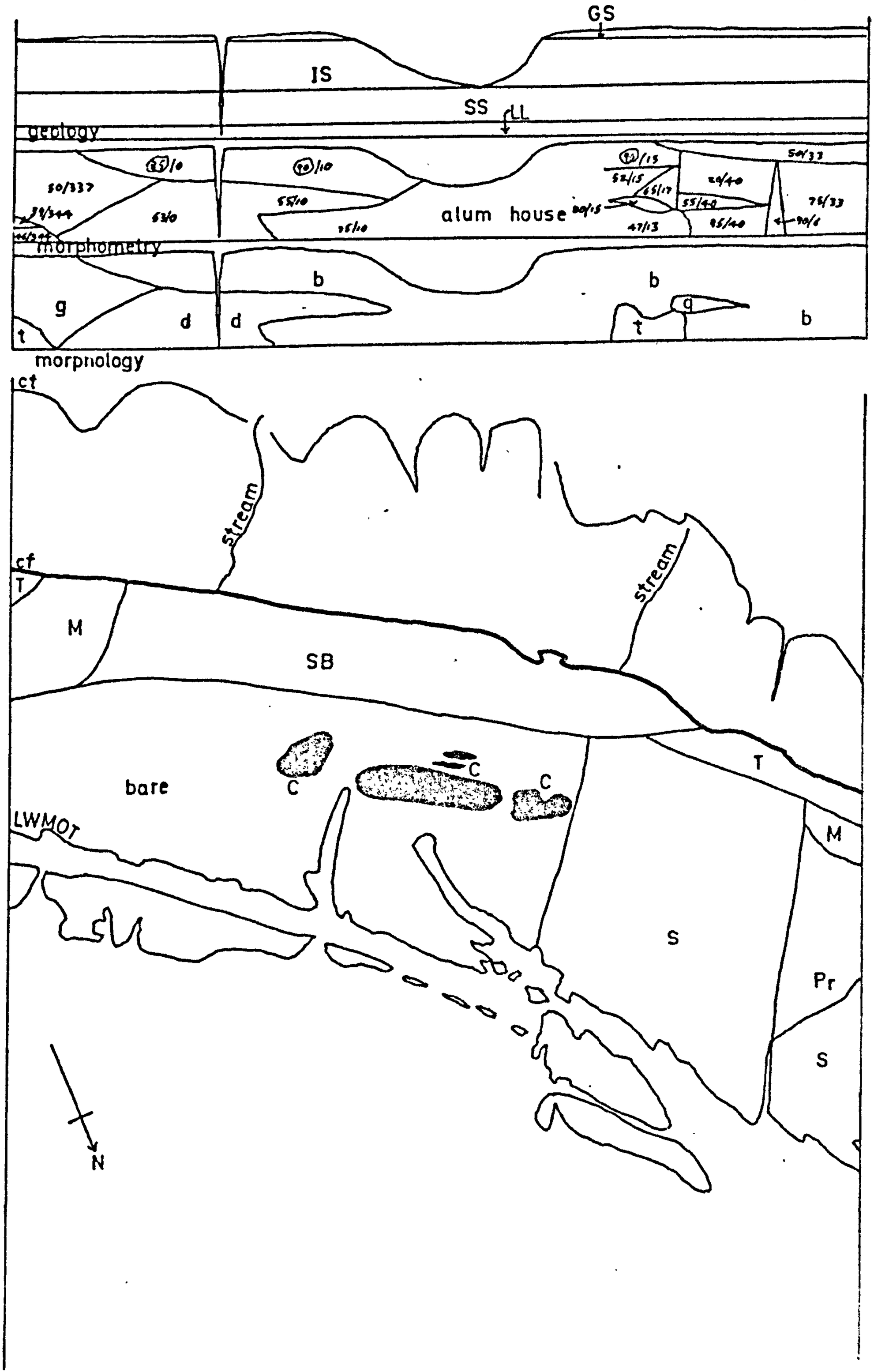
SHEET 34


quarry
80/22
40/22
70/22
90/12
54/12
t
63/0
morphometry
quarry
d
b
d
t
b.
morphology
cf
cf
M
Pr
LWMOT
PB
T
M
S
N

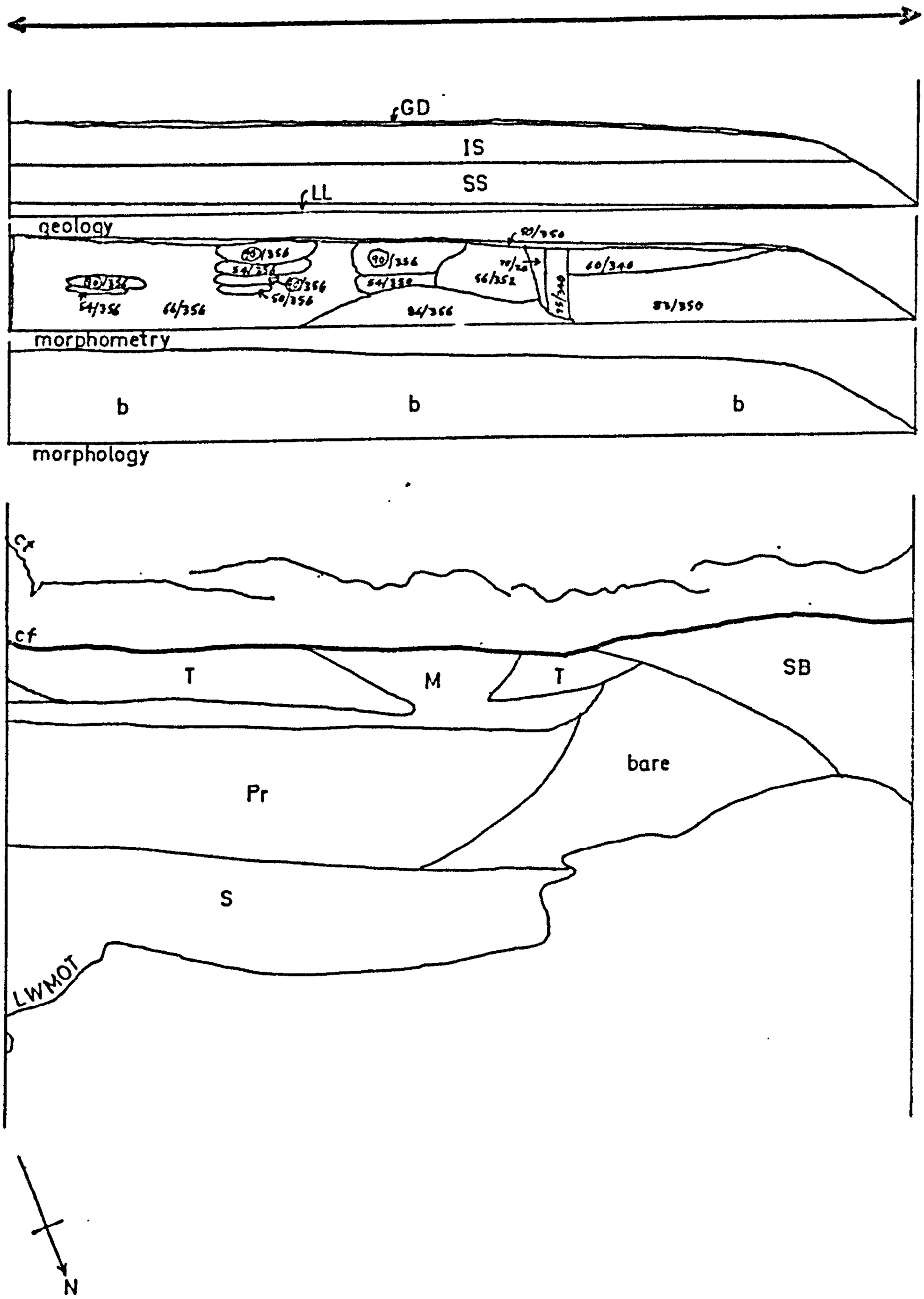
SHEET 35

JRS
GS
IS
SS
LL
geology
quarry
66/352
51/342
94/33
52/316
44/331
52/326
52/332
40/320
58/321
42/338
60/309
36/325
41/338
34/344
46/344
morphometry
quarry
b
g
b
tg
b
tg
g
b
tg
t
b
t
morphology
ct
T
M
S
PB
T
bare
cf
T
Pier
T
Pr
S
LWMOT
N

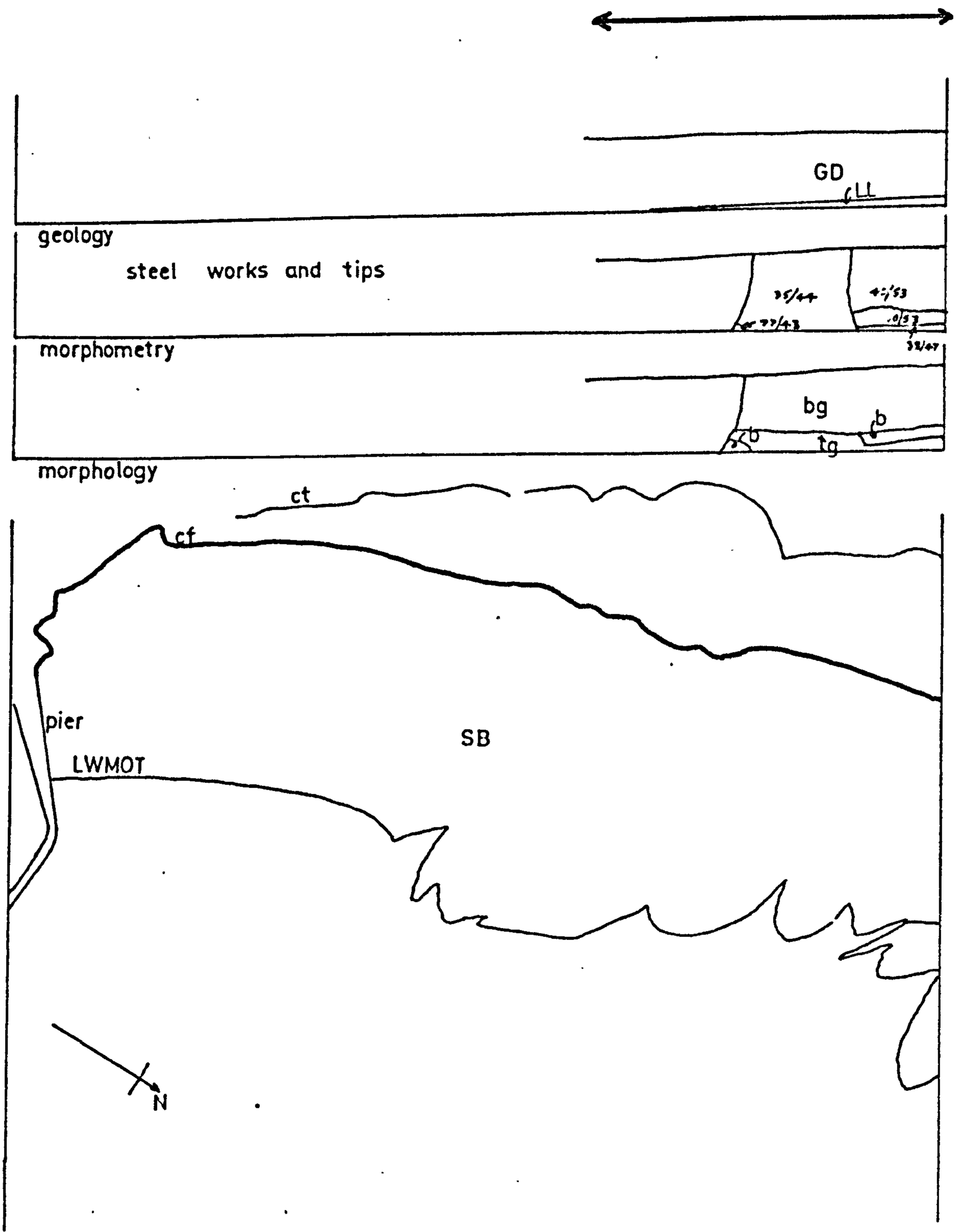
SHEET 36


GS
IS
SS
LL
geology
50/33
50/33
55/10
95/10
alum house
75/33
morphometry
g
d
t
b
d
b
q
t
b
morphology
cf
stream
cf
T
M
SB
stream
bare
C
C
C
T
LWMOT
M
S
Pr
S
N

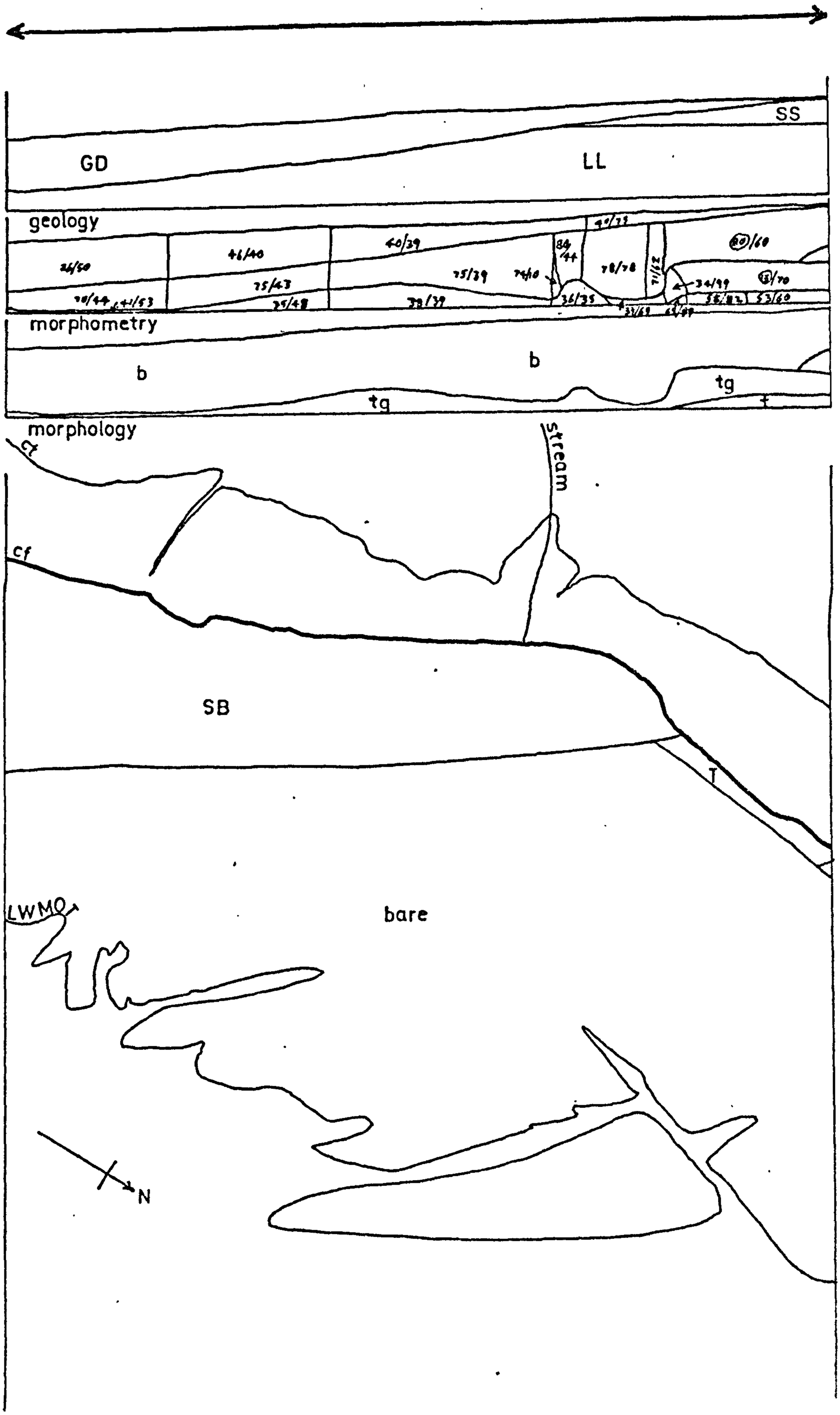
SHEET 37


GD
IS
SS
LL
geology
morphometry
b
b
b
morphology
cf
T
M
T
SB
bare
Pr
S
LWMOT
N

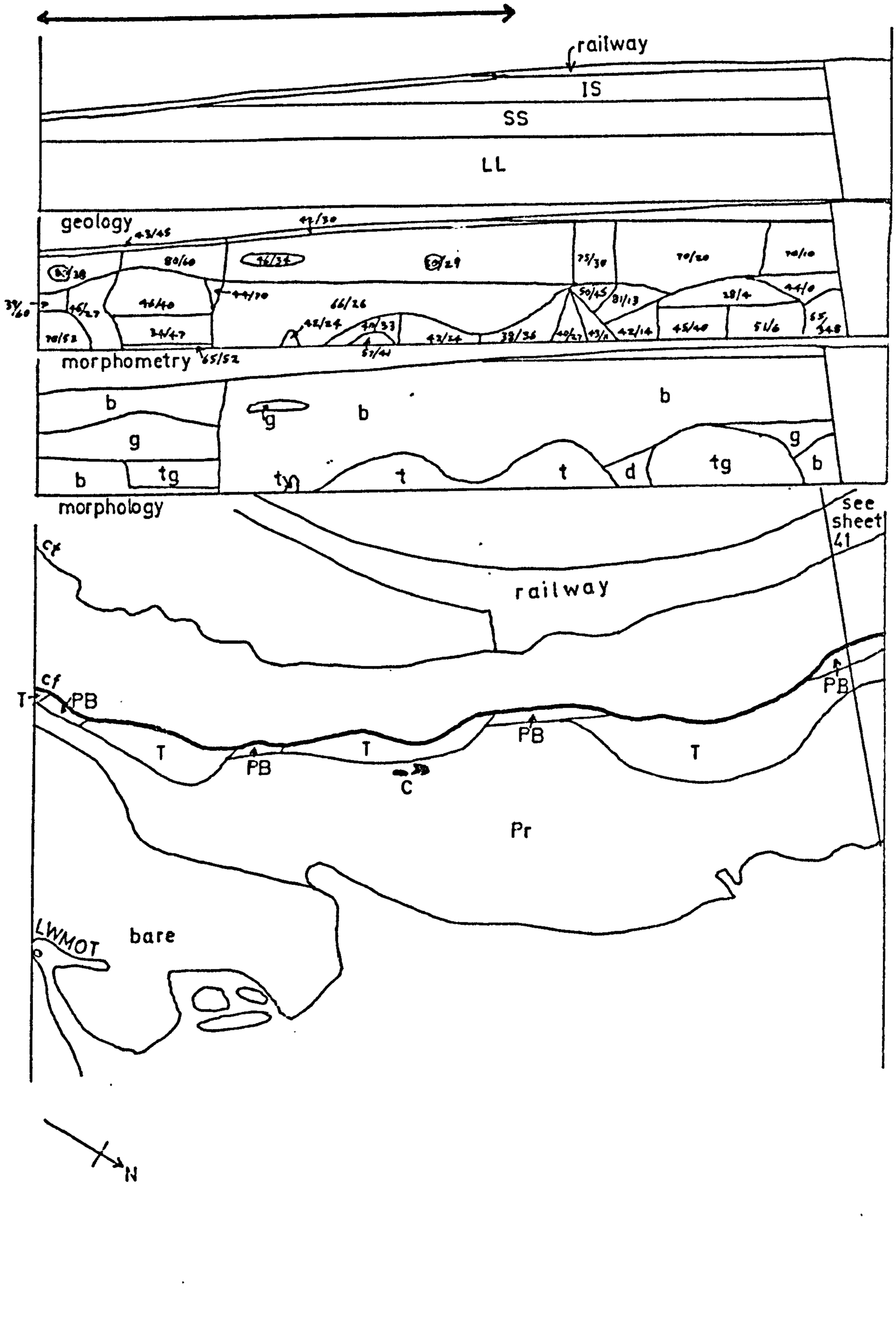
SHEET 38


GD
LL
geology
steel works and tips
35/44
4:/53
.0/53
morphometry
bg
b
b
tg
morphology
ct
cf
pier
SB
LWMOT
N

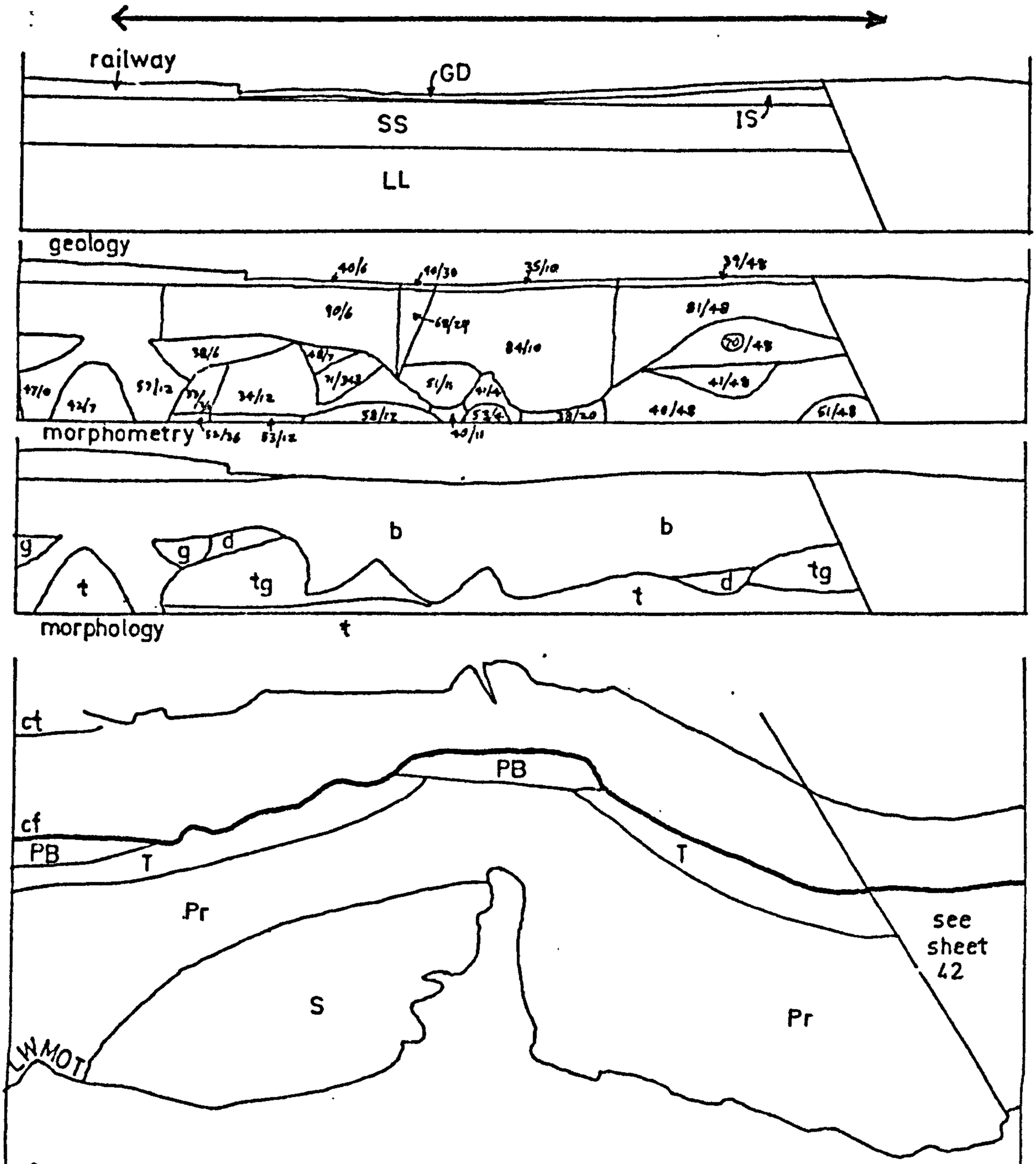
SHEET 39


SS
GD
LL
geology
morphometry
b
b
tg
tg
morphology
ct
stream
cf
SB
T
LWMO
bare
N

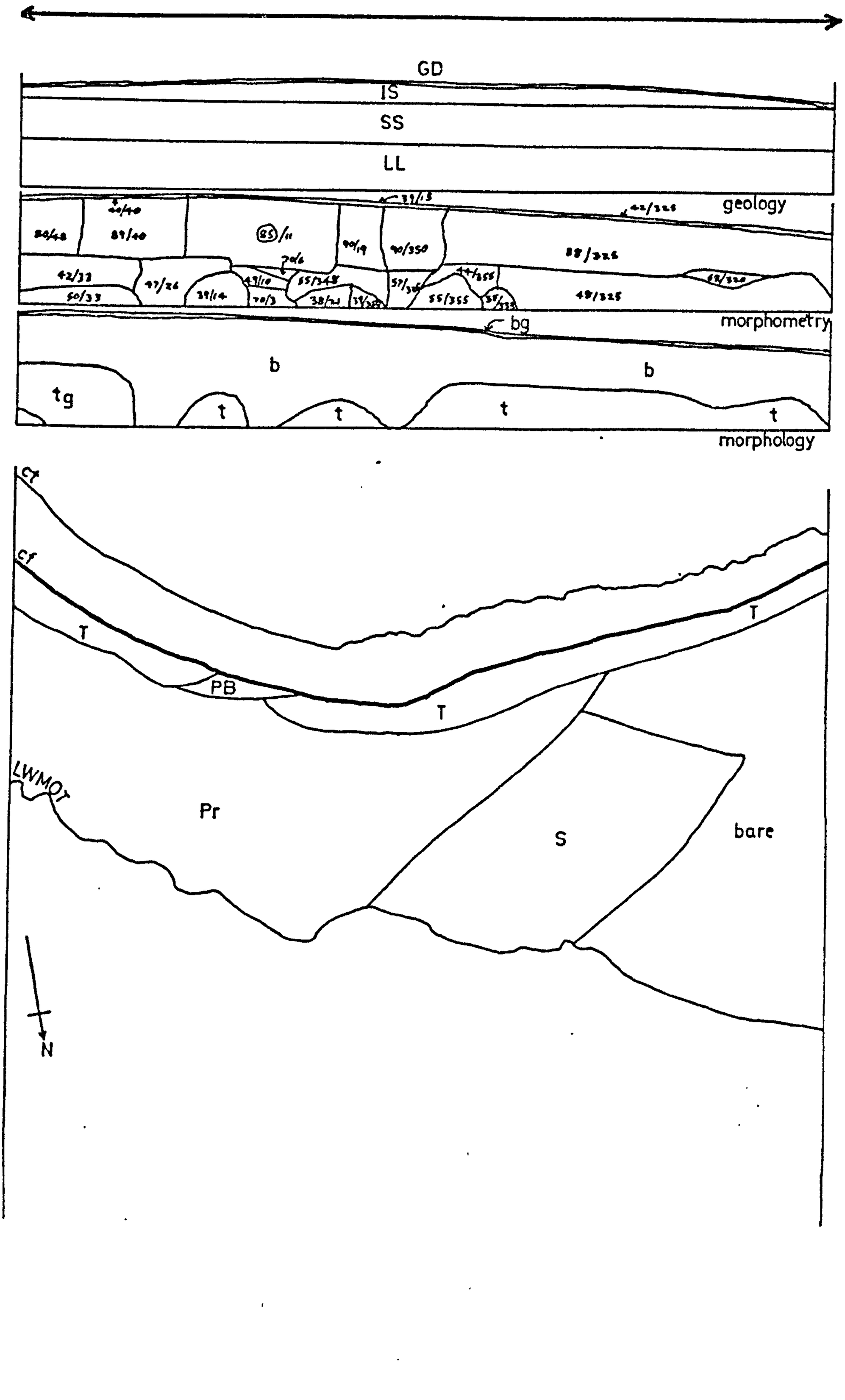
SHEET 40


railway
IS
SS
LL
geology
morphometry
morphology
b
g
tg
t
d
see sheet 41
railway
cf
T
PB
C
Pr
bare
LWMOT
N

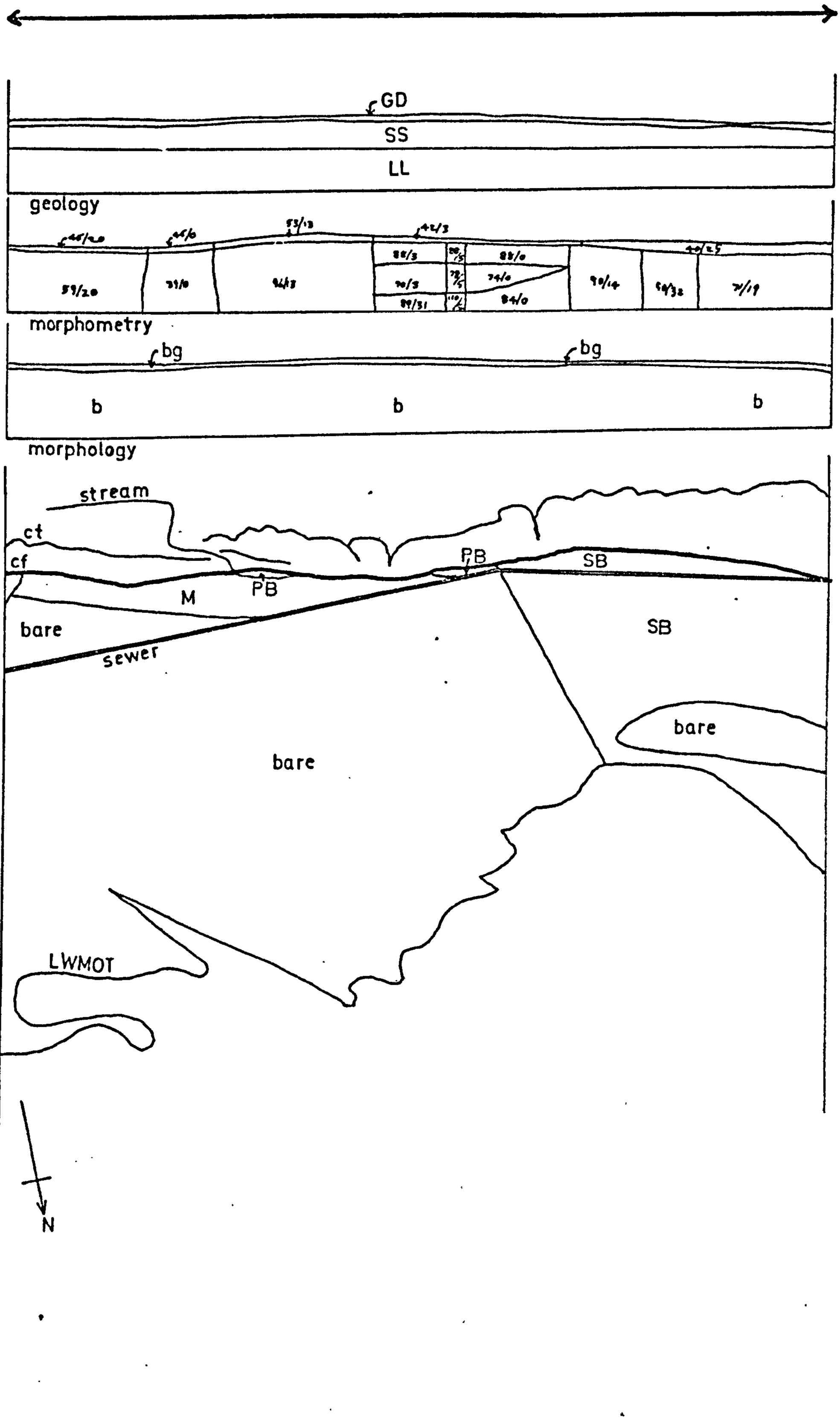
SHEET 41


railway
GD
SS
IS
LL
geology
40/6
40/30
35/10
39/48
90/6
68/29
84/10
81/48
70/48
41/48
38/6
48/7
51/14
41/4
47/10
42/7
57/12
34/12
58/12
53/4
38/20
40/48
51/48
morphometry
52/36
53/12
40/11
b
b
g
g
d
t
tg
t
d
tg
t
morphology
ct
PB
cf
PB
T
T
Pr
S
Pr
see
sheet
42
LWMOT
N

SHEET 42


GD
IS
SS
LL
geology
morphometry
bg
b
b
tg
t
t
t
t
morphology
cf
cf
T
T
T
PB
T
LWMOT
Pr
S
bare
N

SHEET 43


GD
SS
LL
geology
45/20
44/6
53/13
42/3
59/20
39/10
44/13
88/3
90/5
89/31
88/0
74/0
84/0
90/14
40/32
morphometry
bg
bg
b
b
b
morphology
stream
ct
cf
T
M
PB
PB
SB
SB
bare
sewer
bare
bare
LWMOT
N