measures at Mount Cygnet, the following rocks are to be met with in ascending order:—

1. Felspar porphyries and associated metamorphic rocks.
2. Dark-blue, friable, shaly mudstones of Upper Palæozoic Age, quietly reposing upon the denuded surfaces of No. 1, dipping at an angle of 15deg. S.S.E.
3. Spirifer zone* of the Upper Pal. marine beds succeeding No. 2 along the course of Gardner's Creek, same dip as No. 3.
4. Fenestella beds* succeeding No. 3, same dip as Nos. 2-13.
5. Lower coal measures, succeeding No. 4, still bearing the same angle of dip.

The distance from No. 1 to No. 5 in a straight line may be roughly estimated at about three miles.

It will be seen, therefore, that the relation of the lower coal measures to the marine beds at Mount Cygnet corresponds closely to that of the Adventure Bay coal measures immediately to the south, towards which they dip.

* Species identical with the common forms at Variety Bay.

HAREFIELD, FINGAL BASIN.

Under the direction of Mr. Bateman a trial bore by means of the diamond drill was sunk recently at Harefield to a depth of about 723 feet in search of coal seams. Sections of this bore were submitted to the writer from time to time, and from the evidence of contained plant impressions and other fossils, it was clearly revealed that a thin deposit of the lower coal measures existed below the marine beds of Upper Palæozoic Age and directly reposing upon the common soft clay states of the district of Upper Silurian Age.

The following is an abstract of the principal rocks passed through in this bore:—

Mesozoic.	ft.	in.
Surface soil, black clay, and drift ...	3	0
Sandstone	7	0
Shale	16	6
Sandstone	0	8
Coal	3	6
White band	0	10
Coal	1	3
Shale	2	1
Sandstone, with thin coal flakes... ...	12	0
Coarse sandstone	17	6

Mesozoic.	ft.	in.	ft.	in.
Sandstone	5	2		
Shale and coal	0	8		
Sandstone	15	7		
Shale and coal	1	0		
Coarse sandstone	1	0		
Shale	7	6		
Coal, with thin partings of sandstone ...	3	6		
Sandstone, with streaks of coal	18	0		
Black shale, including 2in. of coal ...	7	6		
Sandstone, with coal flakes	3	3		
Coal	2	9		
Black shale...	7	0		
Fireclay and shale	2	6		
Black and blue shales, including 8in. coal and 1 foot of sandstone	6	6		
Sandstone, with coal flakes	1	8		
Sandstone	19	8		
Coal and black shale	0	6		
Grey sandstone	16	6		
Shale and fireclay	15	0		
Sandstone, with coal flakes	5	8		
Blue shale	3	6		
Coal	0	5		
Hard sandstone	1	4		
Black shale	3	6		
Sandstone	2	3		
Black shale and coal	0	4		
Dark sandstone	1	6		
Black and blue shales, including two thin partings of coal and one of sandstone	11	3		
Shale, with layers of sandstone	5	7		
Shale, including 1 foot coal	11	1		
Sandstone	5	0		
Dark shale and fossil wood	0	2		
Shale and fireclay	6	2		
Sandstone	1	0		
Shale coal and fossil wood	0	4		
Sandstone	2	0		
Shales, with fern impressions forming base of mesozoic rocks	2	0		
			264	0

Carboniferous (Upper Pal.).

Upper Marine Beds.

Coarse and hard sandstone	13	2		
Hard blue rock, with pebbles	16	6		
Blue shale	40	5		
Blue shale, with marine fossils	11	7		
Blue shale	9	0		
Conglomerate	2	0		
Hard grey rock	6	6		
Green sandstone	11	0		
Conglomerate	1	0		

	ft.	in.	ft.	in.
Fossiliferous limestone, with *Fenestella*, etc.	28	6		
Limestone and conglomerate	23	6		
Fossiliferous limestone and mudstones...	79	8		
Layers of mudstone shale and hard rock, with water-worn pebbles	13	7		
Hard grey rock, with pebbles	11	10		
Shale and sandstone	46	0		
Sandstone	8	8		
			313	0
Lower Coal Measures.				
Conglomerate	1	0		
Soft shale	2	6		
Conglomerate	3	1		
Hard white sandstone	1	8		
Grey sandstone, showing coal stains ...	7	0		
Hard black shale	3	6		
Sandstone	3	8		
Dark sandstones	5	7		
Conglomerate	0	10		
Hard dark sandstone	2	10		
Conglomerate	0	4		
Hard black shale	1	5		
Conglomerate and sandstone	1	10		
Shale ; impressions of *Schizoneura (?)* ...	0	2		
Coal	0	1		
Hard black shale	4	4		
Sandstone, full of coal stains	57	11		
			97	9
Upper Silurian.				
Soft grey foliated slates, pierced to a depth of ...			40	0
Total...			714	9

The foregoing section is of the greatest interest, as it forms one of the best evidences yet obtained regarding the stratigraphic relation of rocks of the Fingal basin. The particulars were most carefully tabulated by Mr. Bateman at the close of each day, and may, therefore, be depended upon as being fairly accurate.

It is clear, although, unfortunately, no important coal seams were met with, that the lower coal measures exist in this district below the *Fenestella* limestones and mudstones of Upper Palæozoic Age, and the existence of a very thin coal seam together with shales containing plant impressions akin to the *Schizoneura* and possibly *Gangamopteris* of the Mersey District indicate that the beds are probably the equivalents of the lower coal measures of the Mersey. It is of interest to observe also that the Mersey coal measures also repose upon Silurian rock, although in the latter district limestones are probably of Lower Silurian Age.

The following summary may be of further interest in showing the parellelism between the rocks of the two districts :—

Mesozoic Rocks.	Bore at Tarleton.* DEPTH.	Bore at Harefield† DEPTH.
1. Upper coal measures, with Thinnfeldia, etc.	Apparently absent	About 270 feet.
Carboniferous System.		
2. Upper Marine beds, with limestones containing *Spirifera* and *Fenestella*	Apparently absent	327 feet.
3. Lower coal measures, with *Gangamopteris*, *Schizoneura*, etc.	About 200 feet	98 feet.
4. Lower Marine beds	170 feet	Apparently absent
Devonian System.	Apparently absent	Apparently absent
Silurian System.		
5. Upper Silurian slates, grits, etc.	Apparently absent	40 feet where depth of bore reached.
6. Lower Silurian limestone.	Pierced 36 feet when drill withdrawn	

* Mersey district. † Fingal district.

It is probable that the lower coal measures of the Fingal district are of limited extent, as the sections to the west and north do not disclose their existence. To the east an important fault, throwing up the older rocks, cuts them off. It would seem, therefore, that it is only possible for them to show greater development in a southerly direction—that is, towards the Fingal Tier, where the upper coal measures of Mesozoic Age are again largely developed, abutting against or underlying the greenstone rocks which characterise the greater portion of the crest and upper levels of the tier.