

"WHAT'S IN A NAME?" - A REVIEW

OF "DONNYBROOK SUNKLAND" TERMINOLOGY

I.G. Lennon

Introduction

Low Plateau, Blackwood Area, Blackwood Plateau or Bunbury Trough - these are all names that have been used for what we in the Forests Department call the Donnybrook Sunkland. In fact, of all these names, Donnybrook Sunkland is the one that is least well known outside the Department and, even worse, it is incorrect as it is applied.

A rather indistinct geomorphological unit is bounded by the Darling Scarp in the east, the Dunsborough Fault in the west, the Whicher Scarp in the north and the weak, broken scarp along the northern limit of the Scott Coastal Plain in the south. When members of the Forests Department refer to the Donnybrook Sunkland, it is this area that is in their minds, and although the two are almost coincident, it is usually the solid block of State Forest in this region that is being referred to (for example, see map, page 2, Forest Focus Number 16).

A petroleum exploration geologist standing on the Leeuwin-Naturaliste Ridge and looking east would certainly think of the area as a sunkland, or, more correctly, a graben (a geological structure resulting from the subsidence of a strip of country lying between two normal faults). A geomorphologist standing at Busselton and looking south-east would regard the area as a plateau (an extensive, level or mainly level area of elevated land). And herein lies the confusion - whether to describe the area in geological (or, more correctly, tectonic - attributable to earth movements) or geomorphological terminology. It cannot be wholly described only in one or the other because its boundaries consist of both tectonic and geomorphological features.

The western boundary of the area (see Fig. 1), the Dunsborough Fault, is a purely tectonic feature with no topographic expression except at its southern end, where it is marked by a small scarp extending a few miles. The northern (Whicher Scarp) and southern (un-named scarp) boundaries are purely geomorphological features resulting from marine erosion. The

Darling Scarp, forming the eastern boundary, is both a geomorphological and a tectonic feature, being the surface expression of the Darling Fault.

Brief descriptions of the tectonic and geomorphological histories of the area show how this situation has arisen.

### Tectonic History

Because the northern and southern boundaries are only geomorphological features, tectonically the area is part of a much larger feature known as the Bunbury Trough, which in turn is part of the Perth Basin. The Bunbury Trough is a graben bounded by the Darling and Dunsborough Faults. In this graben, formed by subsidence of the Precambrian basement, a predominantly sandy sequence was deposited in a continuously continental environment from Lower Permian to Lower Cretaceous. Subsidence appears to have ended in the early Cretaceous. Geophysical surveys and deep boreholes, mainly prompted by oil exploration, indicate a maximum thickness of approximately 9 000 m of gently dipping or horizontal sedimentary rocks disrupted by several large faults. Figure 2 shows an east-west geological cross-section of the area; the position of the section is shown in Figure 1.

The Bunbury Basalt, which only rarely outcrops, probably represents a single lava flow which spread across the southern part of the Perth Basin. It possibly reached the surface by way of the Darling Fault, and its eruption in the Lower Cretaceous may have marked a period of movement on the fault.

Following the cessation of subsidence and deposition in the Trough, uplift and removal by erosion of some of the Lower Cretaceous strata occurred.

### Geomorphological History

Most of the geomorphological features mentioned are shown in Figure 1.

The area now consists of undulating hills forming a laterized surface with a local variation in relief of the order of 10 to 20 m. The maximum elevation of 150 m is found in the Whicher Range, south of the Whicher Scarp. Laterization is post uplift, and dissection of the area has occurred simultaneously with continuing laterization. Deep dissection has been caused by the Saint John Brook - Saint Paul Brook - Mill Brook tributary system of the Blackwood River.

A systematic variation in the elevation of the semi-mature surface of the area suggests an uplift of middle to late Tertiary age. Generalized contours drawn on this surface (see Fig. 1) indicate an east-west axis (Jarrahwood Axis) of uplift with a gentle westward plunge. This axis was probably the prime control for the formation, by marine erosion during the Pleistocene, of the Whicher Scarp and probably also of the very dissected and poorly defined scarp separating the area from the Scott Coastal Plain.

### Terminology

The confusion resulting from the possibility of naming the area either according to its tectonic or its geomorphological history is reflected in the various names that have in fact been used.

Despite statements to the contrary by Smith (1951) and Finkl (1971), neither Saint-Smith (1912) nor Jutson (1914) attributed any term to the area. In 1951, Gentilli and Fairbridge applied the term Donnybrook Sunland to a "physiographic region" which included the area under discussion, the Swan Coastal Plain around Busselton and the Scott Coastal Plain; the Leeuwin-Naturaliste Ridge was recognized as a "subregion". Smith (1951) chose a contradiction in terms and referred to the area as a low plateau, but it took until 1960 for the term to be formalized by McArthur and Bettenay.

After mapping of the area by the Geological Survey, Lowry (1967) called it the "Blackwood Area", thereby avoiding both tectonic and geomorphological terminology. Finkl (1971) subsequently returned to the use of "Low Plateau", but in 1972 Cope cunningly combined the two terms and proposed the use of "Blackwood Plateau".

The recently published Memoir of the Geological Survey (1975) shows the area as being part of the Bunbury Trough, and this is used only in a tectonic sense. A Bulletin on the Perth Basin, soon to be published by the Geological Survey, will refer to the area as the Blackwood Plateau (pers. comm. R. Connolly, Geological Survey).

### Conclusion

There are, therefore, two terms which can be applied to the area bounded by the Dunsborough and Darling Faults, the Whicher Scarp and the un-named scarp to the north of the Scott Coastal Plain. Tectonically it is part of the Bunbury Trough. Geomorphologically it is the Blackwood Plateau. The term

Donnybrook Sunkland is incorrect (in the sense used by the Forests Department) and out of date. It should be changed immediately and, as forestry is more concerned with geomorphology than it is with tectonics, the Forests Department should henceforth refer to the area as the Blackwood Plateau.

A change of name, however, would presuppose that the name would not be changed again by some future geomorphologist - and history shows this to be unlikely. In 40 years time the area may well be referred to as the Blackwood Pine Forest; so perhaps, after all, there is something to be said for keeping Donnybrook Sunkland, and anyway, as those inclined to bardolatry might well ask, "What's in a name?"

#### REFERENCES

- COPE, R.N. (1972). Tectonic style in the southern Perth Basin. Geol. Surv. W. Aust. Annual Report for 1971. 46-50.
- FINKL, C.W. Jnr. (1971). Levels and laterites in southwestern Australia. Search 2, 382-383.
- FORESTS DEPARTMENT OF WESTERN AUSTRALIA. (1975). Focus on Sunklands multiple use land management. Forest Focus 16.
- GENTILLI, J. and FAIRBRIDGE, R.W. (1951). Physiographic diagram of Australia. Geographical Press, Columbia University, New York.
- GEOLOGICAL SURVEY OF WESTERN AUSTRALIA (1975). The geology of Western Australia. Geol. Surv. W. Aust. Memoir 2.
- JUTSON, J.T. (1914). The physiography of Western Australia. Bull. Geol. Surv. W. Aust. 61 (2nd edn, 1934, Bulletin 95; 3rd edn, 1950).
- LOWRY, D.C. (1967). Busselton and Augusta, Western Australia. Australian Bureau of Mineral Resources 1:250 000 Geological Series Explanatory Notes. Sheets S1/50-5 and S1/50-9.

McARTHUR, W.M. and BETTENAY, E. (1960). The development and distribution of the soils of the Swan Coastal Plain, Western Australia. C.S.I.R.O. Soil Publication 16.

SAINT-SMITH, E.C. (1912). A geological reconnaissance of a portion of the South-West Division of Western Australia. Bull. Geol. Surv. W. Aust. 44.

SMITH, R. (1951). Soils of Margaret and Lower Blackwood Rivers, W.A. C.S.I.R.O. Bull. 262.

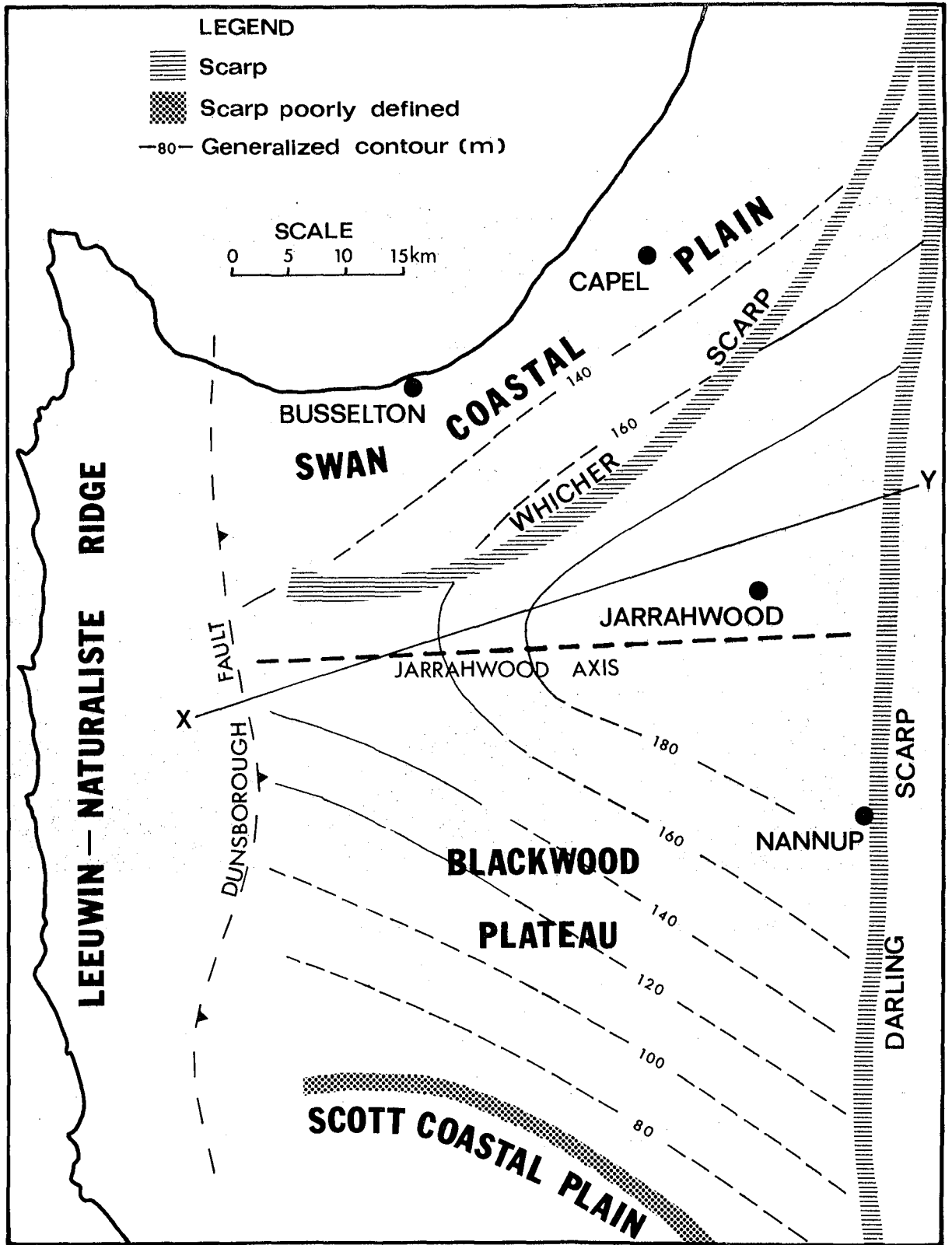
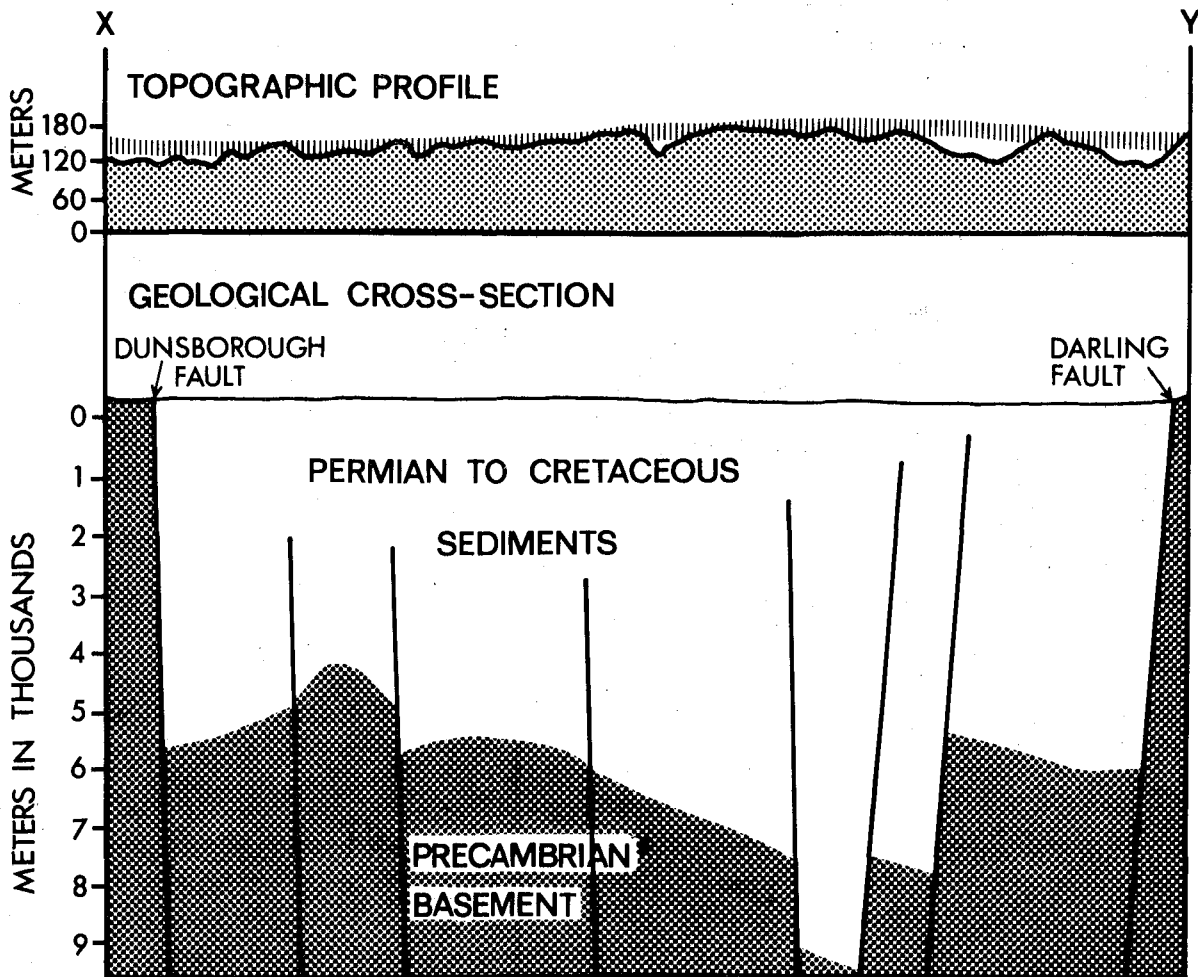


Figure 1

Geomorphological features of the Blackwood Plateau (after Cope, 1972).



||||||| Post Lower-Cretaceous erosion surface



Figure 2  
Topographic profile and geological cross-section  
of the Blackwood Plateau (after Cope, 1972).