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BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

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Fractures Study - Murrays Beach Area,  
Commonwealth Territory Jervis Bay



by

W.J. Perry

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# FRACTURE STUDY - MURRAYS BEACH AREA, COMMONWEALTH TERRITORY

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### SUMMARY

The study indicates that fractures visible on air photographs of the Murrays Beach area do not have strongly preferred orientation, but some preference is shown for a zone ranging from 25 degrees west to 25 degrees east of true north, and for the azimuth class 285-295 degrees.

### INTRODUCTION

Two sets of air photographs were examined, one in colour, the other black and white, the latter being printed from colour negatives. All photography and processing was carried out by the Electricity Commission of N.S.W. Alternate photos were overlaid with "ultraphan", a transparent plastic film, and examined stereoscopically with a high quality mirror stereoscope mounted on a traversing mechanism and equipped with 3 x binoculars. Visible fracture traces were annotated on the overlays on which the true north direction was also marked by reference to a topographic map. The location of the centre points of annotated photographs is shown on Figure 1. The number of fracture traces was counted in each ten degree azimuth class, the first class being centred about true north, i.e. from 355 to 005 degrees. The histograms in Figure 2 show the number of fractures in each class; the figures 21, 25, 3, 12 and 10 refer to the particular air photographs that were annotated. Approximate scales of Nos. 21 and 25 are 1 cm to 120 metres, and of the other three 1 cm to 66 metres. Fracture numbers were counted by superimposing on the overlays a perspex plate, with a 10° cut-out, mounted to obtain the numbers in each class, using a two-dimensional optical filter (Larerscan, trademark of Conductron Co. Michigan) as described by Maffi (1969) but without success. On the air photographs the fractures

are visible only in a narrow zone along the coast and therefore show as very short lines concentrated in arcuate zones on the overlay; this is thought to be the reason for poor filtering by the scanning device, i.e. not sufficient definition to enable a definite count to be made within each class.

### DISCUSSION

In general the histograms indicate no particularly strong trends. However, when considered in more detail they show some preferred orientations of fractures. Histograms 21b and 3, both both from black and white photographs refer specifically to the mainland near Murrays Beach. It is evident that fractures cluster in a zone twenty-five degrees either side of north with slight concentrations in the classes 345-355 and 005-015 degrees; in addition on No. 3 there is a "background count" of fractures from 055 to 090 and from 305 to 270, with a maximum in the class 285-295. In 21b there is a similar "background count" from 067 to 090, and from 305 to 270. A somewhat similar clustering about true north was noted by Jackson (1969, Plate 3, unpubl.).

Photo 21 covers both Bowen Island and the mainland, and two histograms were drawn, No. 21b covering the mainland, and No. 21a the whole area. No. 21a shows fractures in two zones either not represented or unimportant in No. 21b and 3, namely, 025-055 and 305-335.

In No. 10, a histogram from a large-scale colour air photograph solely of Bowen Island, fractures are recorded in both zones, but are more numerous in the zone 025-055.

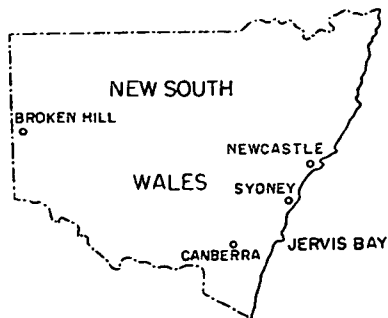
Nos. 25 and 12 are each composites of the mainland plus part of Bowen Island; No. 25 shows a peak in the class 285-295 which compares well with No. 3, but the fractures present in the zone 025-255 in both Nos. 25 and 12 derive from the Bowen Island component.

REFERENCES

JACKSON, M.J., 1969 - Engineering Geology and Economic Resources  
of Commonwealth Territory, Jervis Bay.  
Bur. Miner. Resour. Aust. Rec. 1969/88.  
(unpubl.).

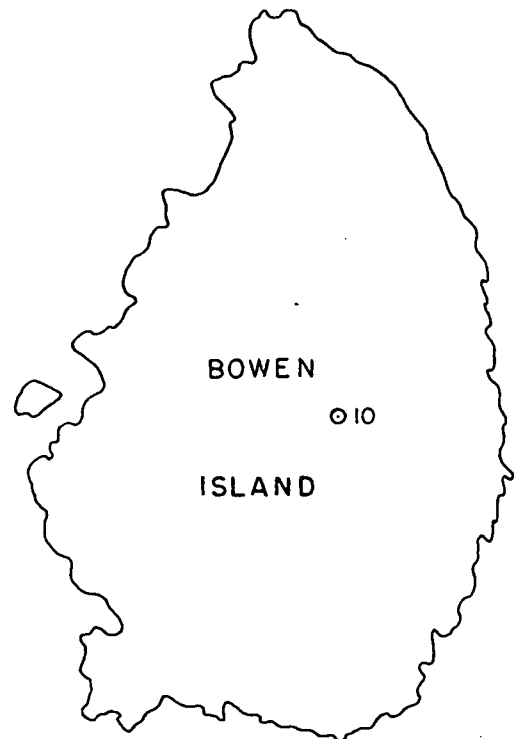
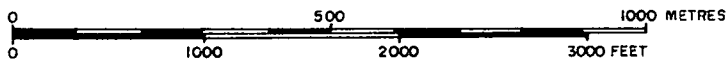
MAFFI, C.E., 1969 - Statistical analysis of photogeological linear  
features, Cape Preston Area, Western Australia.  
Bur. Miner. Resour. Aust. Rec. 1969/116. (unpubl.).

Murrays Beach Area  
Commonwealth Territory  
Jervis Bay

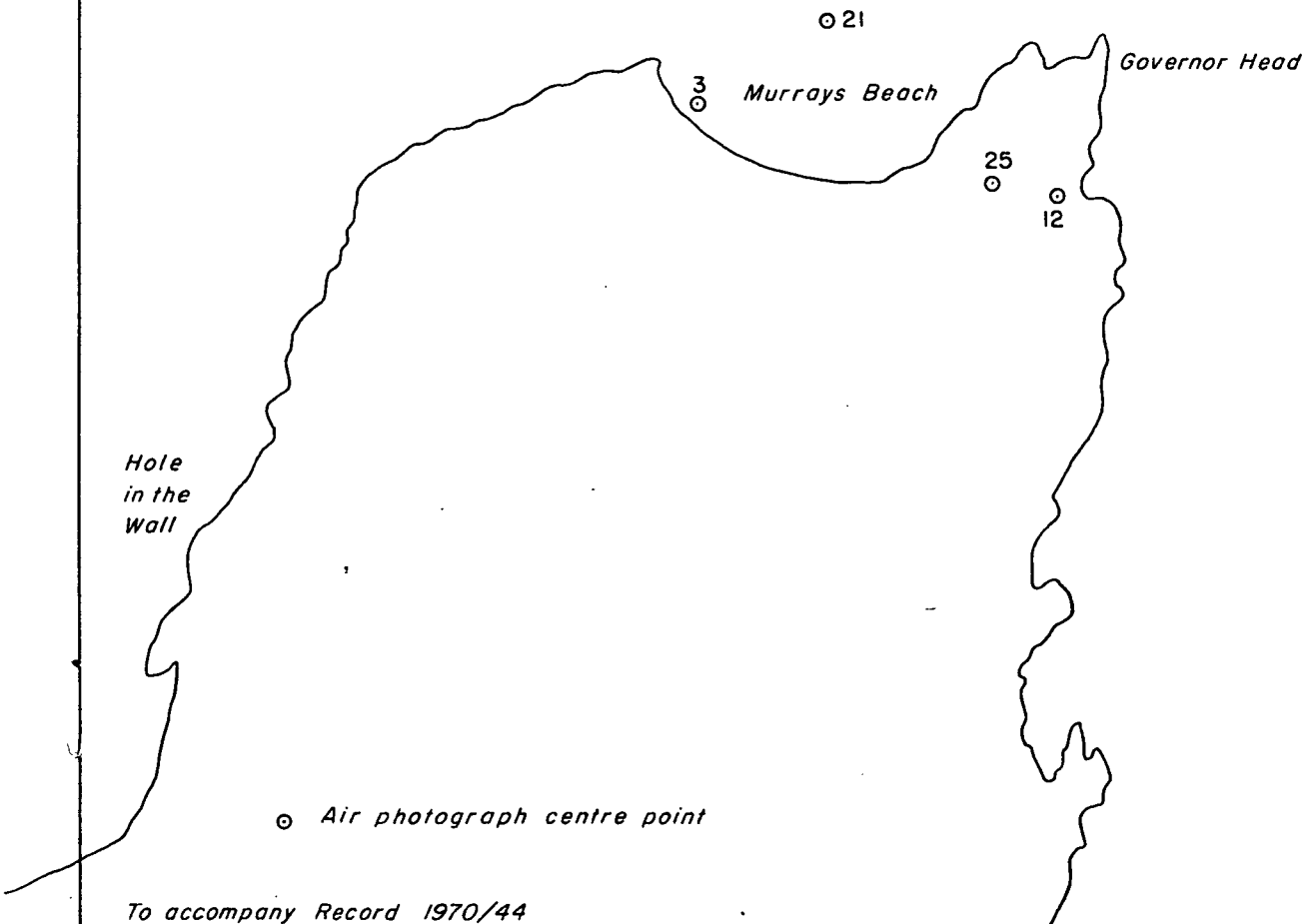


LOCALITY MAP

Scale



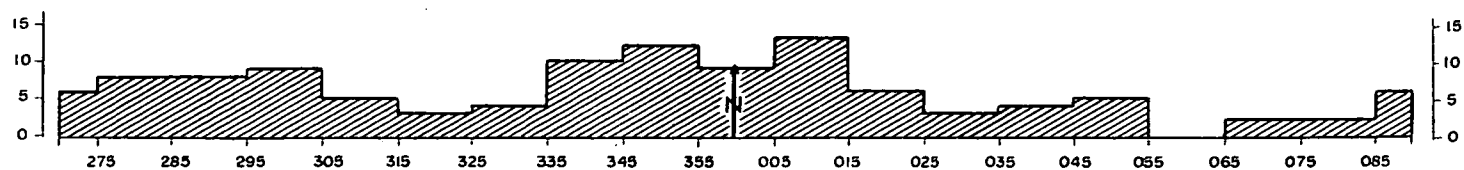
Jervis Bay



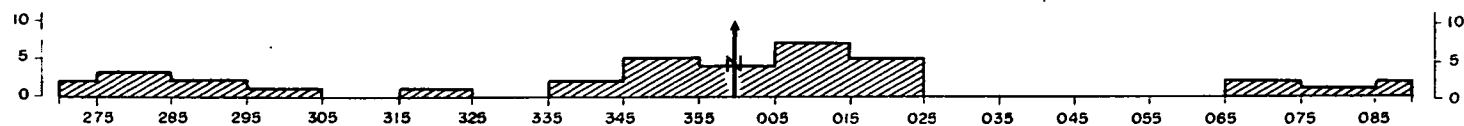
To accompany Record 1970/44

Fig. 1

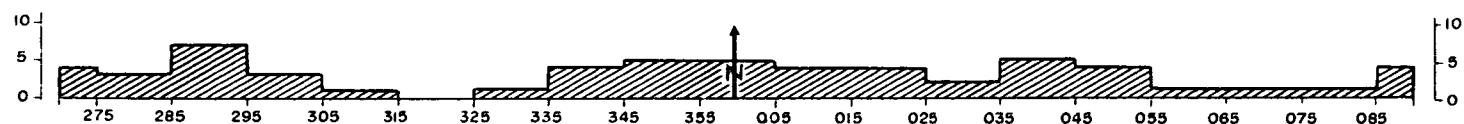
# Fracture Histograms Commonwealth Territory Jervis Bay



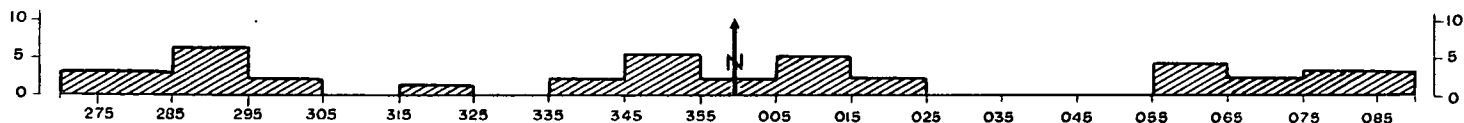
21a Bowen Island and mainland



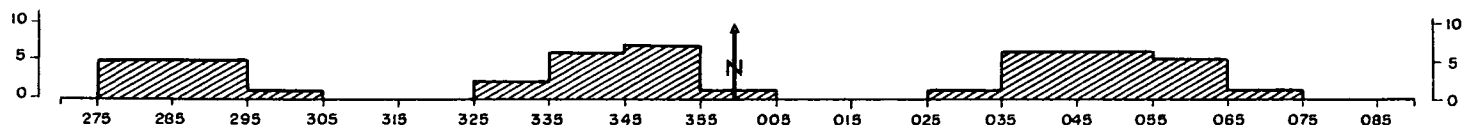
21b Mainland



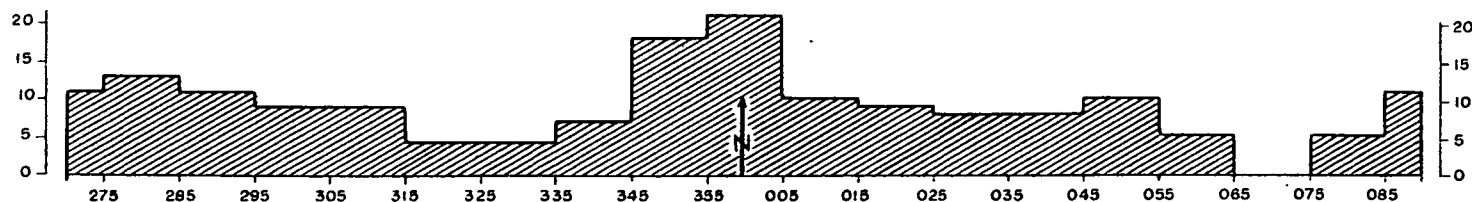
25 Mainland and most of Bowen Island



3 Mainland



12 Mainland and Southern end of Bowen Island



10 Bowen Island

Horizontal scale indicates azimuth  
Vertical scale indicates number of fractures