SHORT NOTES

RAISED MARINE FEATURES ON THE SOUTH SIDE OF ROYAL BAY, SOUTH GEORGIA

By P. STONE

ABSTRACT. An extensive sea-cave system is associated with a series of raised beaches approximately 2 km. west of Will Point on the southern side of Royal Bay. Radiocarbon dating of organic material found in the caves suggests that both they and a raised beach now 5–6 m. above sea-level were formed at least 1,500 yr. ago.

BETWEEN Will Point (lat. 54°33′S., long. 36°01′W.) and Ross Glacier (lat. 54°32′S., long. 36°06′W.), on the southern shore of Royal Bay, South Georgia, a series of raised beaches is associated with an old sea-cave system (Fig. 1). The caves had been visited previously by

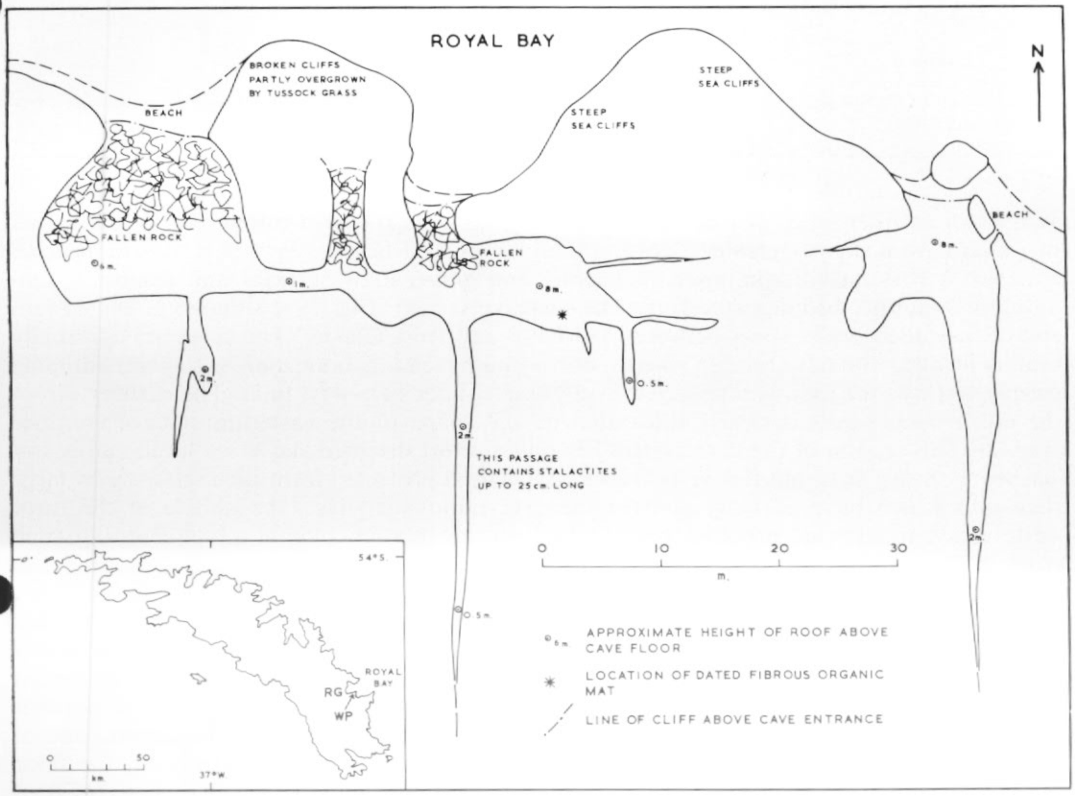

Fig. 1. Sketch map (plan view) of the sea-cave system approximately 2 km. west of Will Point. The inset is of South Georgia showing localities mentioned in the text (RG, Ross Glacier; WP, Will Point).

members of the British South Georgia Expedition of 1954–55 (Sutton, 1957) but the observations on which the present account is based were made during March 1972 and December 1973 as part of a geological survey of the north-east coast of South Georgia.

A series of three raised beaches has developed approximately 2 km. to the west of Will Point. The beaches are mainly composed of small boulders and cobbles, and were probably formed by the successive progradation of storm ridges as sea-level fell. The highest of the beaches is covered by a thin veneer of peat and tussock grass, and has been extensively eroded by the movement of seals. Three levelling traverses were made across the beaches at intervals of about 150 m. and the results are summarized in Table I. Immediately to the south-east of Will Point another series of three raised beaches has been reported (Stone, 1974), the higher of which have a slightly greater elevation than the highest beaches farther west. The beaches close to Will Point are composed of pebble- and gravel-sized particles and exhibit a well-developed internal bedding structure. The sea-cave system (Fig. 1) is situated at the eastern end of the raised beach series between Will Point and Ross Glacier. The caves are essentially fault controlled and have formed where a north–south trending fault zone, with planes dipping steeply towards the east, is intersected by a possibly later east–west fault. The easterly dip of the north–south faults is clearly illustrated by the shape of the easternmost cave entrance (Fig. 2). This section of the cave system lies only a short distance above sea-level, and is still washed by heavy seas, but the western section has been protected from such scouring by large rock falls which have partially blocked the cave mouths. In fact, the middle of the three western cave mouths has probably been formed entirely by roof collapse subsequent to marine erosion.

TABLE I. SUMMARY OF RAISED BEACH DATA

Locality	*Height above sea-level* (m.)								
	SL	1	2	3	4	5	6	7	8
Between Ross Glacier and Will Point									
Traverse 1		1·5		3·5–4		5–5·5			
Traverse 2			2–2·5	3·5–4		5			
Traverse 3				3–3·5		5			
South-east of Will Point (Stone, 1974)			2·5–3				6–6·5		8

The more protected environment of the western part of the cave system has allowed stalactites up to 25 cm. long to form in places. The rock types in which the caves are eroded range from conglomerate and coarse greywacke to shale, but limestones are conspicuously absent. The calcium carbonate necessary for stalactite formation must therefore have been leached out of the greywacke sequence. The contrast in environment between the two parts of the cave system is also reflected in the nature of the cave floors. In the east the seaward end of the cave is covered by water-worn boulders and strewn with fresh kelp. However, the floor of the western part is covered by fine dust and angular debris, much of which must have fallen from the roof of the cave. In the west there were also areas covered by a fibrous mat of organic material up to 25 cm. thick which probably formed early in the history of the caves by the accumulation of washed-in marine debris and moulted seal skin and hair. A sample of this material was kindly radiocarbon dated by Dr. D. D. Harkness of the Scottish Universities Research and Reactor Centre, East Kilbride, and gave an age of 2,369±40 yr. (SRR–520). To correct the falsely old tendency of radiocarbon dates of Antarctic marine organisms, an

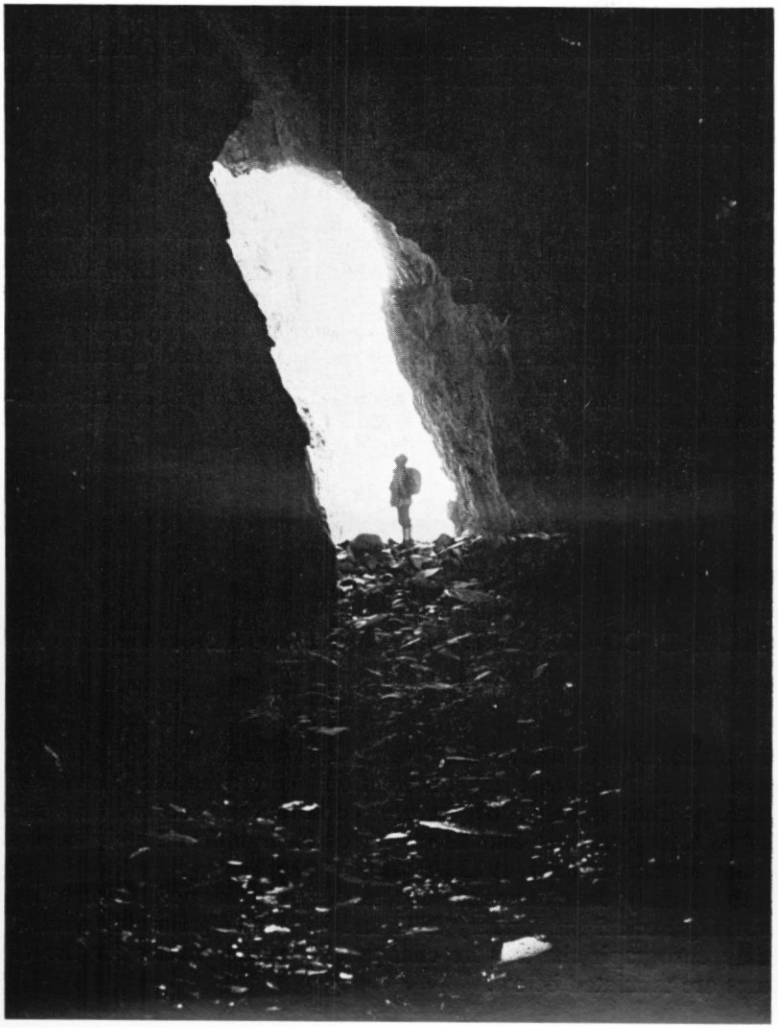

Fig. 2. Looking northward out of the easternmost cave entrance. This illustrates the easterly dip of the north–south fault planes.

adjustment of approximately 750 yr. has been suggested by Sugden and John (1973). A minimum date of 1,500 yr. B.P. would therefore seem likely for the formation of the caves.

Although the large quantities of fallen rock debris make assessment difficult, the floor of the western part of the cave system is approximately 5–6 m. above sea-level. This coincides with the height of the highest of the adjacent raised beaches, and the beach and caves were probably formed contemporaneously. Elsewhere on South Georgia it has been suggested that raised beach shingle now 3·5–7·4 m. a.s.l. was deposited subsequent to a glacier advance culminating approximately 5,500 yr. B.P. (Clapperton, 1971). This would be compatible with a minimum age of formation for the 5–6 m. raised beach of 1,500 yr. B.P.

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SIGNY ISLAND CORRECTED M.S.L. PRESSURES FOR 1970 AND 1971

By D. W. S. Limbert

In the years 1970 and 1971 at Signy Island there were no trained observers to make meteorological observations, and therefore any observations were irregular. There were no control barometric readings. Consequently, the uncorrected barograph records were used as the basis for calculating M.S.L. pressures and these values have unfortunately been circulated or published without further scrutiny (1972, 1976).

In January 1972, daily control barometric readings commenced. Corrections have been deduced by working back from January 1972 and by allowing for any shifts in calibration when the weekly barograph charts were changed. Corrected values for the 1970 and 1971 M.S.L. pressures are tabulated below.

Corrected Signy Island pressures, 1970

	Mean	*Maximum*	*Minimum*
January	993·2	1,013·4	965·4
February	990·1	1,015·4	968·0
March	994·1	1,013·7	980·3
April	985·0	1,006·3	947·5
May	987·8	1,014·2	954·5
June	999·1	1,015·2	975·2
July	999·2	1,023·1	965·2
August	997·7	1,024·2	970·1
September	999·6	1,017·3	963·3
October	996·5	1,010·1	975·5
November	993·3	1,013·8	972·1
December	988·3	1,006·1	969·9
Year	993·7	1,024·2	947·5

CORRECTED SIGNY ISLAND PRESSURES, 1971

	Mean	*Maximum*	*Minimum*
January	991·3	1,012·0	972·3
February	989·5	1,001·1	966·8
March	988·7	1,009·9	969·8
April	991·0	1,012·8	962·3
May	1,000·1	1,020·5	964·5
June	997·7	1,013·5	960·7
July	1,003·9	1,025·0	967·0
August	990·0	1,025·4	960·5
September	993·9	1,019·9	956·7
October	993·2	1,016·5	959·5
November	986·1	1,004·3	969·2
December	992·0	1,007·0	978·8
YEAR	993·1	1,025·4	956·7

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