

C. S. O.

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SUBJECT:

LIME DEPOSITS.

CONFIDENTIAL.

FINAL GEOLOGICAL REPORT ON A RECENT LIMESTONE DEPOSIT AT  
SHELL POINT, FITZROY AREA, EAST FALKLAND.

by

R. J. Adie.

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CONNECTED FILES.

NUMBER AND YEAR.

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Stanley,  
Falkland Islands.  
2nd. May, 1950.

Sir,

I have the honour to submit a "Final Geological Report  
on a Recent Limestone Deposit at Shell Point, Fitzroy  
Area, East Falkland."

I am, Sir.

Your obedient servant,

*-Hadi-*

Geologist.

H. E. the Governor,  
Falkland Islands.



FINAL GEOLOGICAL REPORT ON A RECENT LIMESTONE DEPOSIT AT  
SHELL POINT, FITZROY AREA, EAST FALKLAND.

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R. J. Adie.

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I. INTRODUCTION.

Shell Point, which is situated approximately 1½ miles south-south-west of Fitzroy settlement, was visited during the period 14-16th April 1950. During this time comprehensive topographical and geological surveys were undertaken with a view to investigating the economic possibilities of a Recent limestone deposit.

The examination was conducted by means of 16 test-pits, which were dug to prove the extent of the deposit.

II. PREVIOUS WORK.

J.R.F. Joyce, in his "Notes on a Crag Limestone from Port Pleasant, Fitzroy Area, Falkland Islands", has already treated at great length with previous work on limestone deposits and raised beaches in the Falkland Islands. Therefore repetition here is considered redundant.

III. GEOLOGICAL SUCCESSION.

Geological mapping has revealed the following to be the stratigraphic succession in the area under consideration :-

	<u>Maximum thickness</u>
Unconsolidated calcareous sand.	3 feet.
UNCONFORMITY	
Surface limestone.	6 inches.
Unlithified limestone.	2 feet 6 inches.
UNCONFORMITY	
Calcareous black earth.	4 inches.
Clay - black or grey.	4 feet.
UNCONFORMITY	
Upper glacial shales.	-----
Lafonian tillite.	-----

IV. OCCURRENCE AND DESCRIPTION OF RECENT LIMESTONE DEPOSIT .

This limestone is of Recent-origin (according to marine fossils recovered) and is situated on a wave-cut platform, which has a maximum height of 12 feet above present sea-level, not 20-25 feet as recorded by Joyce.

At Shell Point TWO distinct varieties of limestone are present :-

(a) Surface limestone, which is well lithified and has a calcareous matrix. This generally forms a hard reef

to the lower limestone deposit, though directly overlies the glacial shales in numerous places. The major portion consists of fragmented tests of marine organisms such as gastropods and lamellibranchs. Several complete specimens of these together with a few bird bones were recovered.

(b) Unlithified limestone, underlying the surface limestone and usually resting on a black or grey clay. This deposit is comprised almost entirely of marine shell fragments which have undergone marine erosion to a small degree. The limestone is uniformly soft and loosely compacted. Several horizons containing well-preserved mollusca were also noted. Invariably an iron-rich band is present near the bottom of the succession, though pebble bands and clay zones occur within the main mass in lenticular form. There is no cementing material in this deposit.

V. EXTENT OF THE LIMESTONE DEPOSIT.

(a) Surface limestone.

Although the unconsolidated limestone was originally protected from erosion by a 4-6 inch veneer of hard cemented limestone, the latter now remains only as isolated superficial outcrops as indicated in Map II.

The greatest thickness recorded was 6 inches, though invariably the surface limestone was only 4 inches thinning rapidly to less than 1 inch at the margin.

The major outcrop is 150 yards long and 60 yards broad covering an area of 9000 square yards, whereas minor outcrops occur over an area of 2,250 square yards. Calculation reveals a volume no more than 900 cubic yards, of which 60% less than 2 inches in thickness and therefore not economic to remove from the site.

(b) Unlithified limestone.

The areal extent of this deposit, as can be seen in the attached map (Map II), is no more than 60,000 square yards, having a maximum length of 400 yards and breadth no greater than 170 yards at the widest part of the outcrop. Where the outcrop was obscured by vegetation, it was determined by interpolation from Maps III, IV and V.

Since the configuration of both the upper and lower surfaces of the limestone bed is saucer-shaped, as shown in Maps IV and V, it was suspected that the greatest thickness of limestone would be present at the base of such a depression. Careful study of the sections recorded in test-pits A to P (see below para. VI) verifies this and reveals that the maximum thickness is 2 feet 6 inches at F, thinning rapidly towards the limits of the outcrop.

Calculation of the volume of unconsolidated limestone shows that no more than 11,000 cubic yards are available, of which approximately 40% is of no value for agricultural purposes on account of contamination by either wind-blown sand (containing sodium chloride etc) or clay derived from the shaly substratum.

A large proportion of this limestone has already been removed by subaerial erosion.

VI. SUMMARY OF TEST-PIT SECTIONS.

- |    |                  |        |                                |
|----|------------------|--------|--------------------------------|
| A. | Ht. a.s.l. 3'6". | 3'     | Grass.                         |
|    |                  | 6"     | Sandy limestone, soft.         |
|    |                  | *      | Reddish brown limestone, soft. |
|    |                  |        | Black clay.                    |
| B. | Ht. a.s.l. 2'6". | 2'6"   | Grass.                         |
|    |                  | *      | Limestone, soft.               |
|    |                  |        | Black clay.                    |
| C. | Ht. a.s.l. 3'3". | 8"     | Grass.                         |
|    |                  | 2 1/2" | Calcareous brown earth.        |
|    |                  | 2"     | Limestone, soft.               |
|    |                  |        | Pebble band with shells.       |

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- D. Ht. a.s.l. 2'. 2' Limestone, soft.  
\* Black clay.
- E. Ht. a.s.l. 2'. 3" Shingle.  
7" Soft brown calcareous earth.  
1'8" Limestone, soft.  
\* Black clay.
- F. Ht. a.s.l. 3'6". 1' Shingle--off to shingle beach.  
Inland from coast gently rising.
- G. Ht. a.s.l. 4'. 2'6" Limestone, soft.  
\* Black clay.
- H. Ht. a.s.l. 4'6". 1'6" Limestone, soft.  
2" Red band.  
10" Limestone, soft.  
\* Black clay.
- I. Ht. a.s.l. 5'. 3" Limestone, soft.  
\* Black clay.
- J. Ht. a.s.l. 5'. 6" Limestone, soft.  
6" Red limestone, iron-rich.  
3" Limestone, soft.  
4" Calcareous black earth.  
\* Grey-black clay.
- K. Ht. a.s.l. 5'6". Grass.  
2' Black peaty soil.  
\* Black clay.
- L. Ht. a.s.l. 5'6". Grass.  
2' Limestone, soft.  
2" Clay bend.  
1'6" Limestone, soft.  
\* Black clay.

The anomalous thickness of limestone in this pit is explained because the pit was dug on a 2 ft. hummock .

- L. Ht. a.s.l. 8'. 2" Limestone, lithified.  
1' Limestone, soft.  
2" Grey clay.  
\* Black clay.
- M. Ht. a.s.l. 9'6". Grass.  
8" Limestone, soft.  
2" Red clay.  
3" Grey clay.  
\* Black clay.

Surrounding country covered with 2" surface limestone crust.

- N. Ht. a.s.l. 10'. 4" Limestone, lithified  
9" Limestone, soft.  
2" Red limestone, soft, iron-rich.  
2" Limestone, soft.  
\* Black clay.

Surrounding country covered with surface limestone crust up to 4".

- O. Ht. a.s.l. 8'. Glacial shale covered with clayey soil.
- P. Ht. a.s.l. 9'. 9" Limestone, soft.  
\* Black clay.

\* indicates depth of clay up to 4 feet.

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VII. CHEMICAL.

Joyce has already pointed out the high percentage of calcium carbonate ( $\text{CaCO}_3$ ) and definite lack of phosphoric oxide ( $\text{P}_2\text{O}_5$ ). Since the analyses have been done by a reliable chemist they should be accepted as correct.

VIII. ECONOMIC CONSIDERATION.

Since (1) The site of the limestone is only readily accessible from the sea, which would necessitate a jetty being built....

(2) The sea in the embayment west of Shell Point is abnormally shallow, a longer jetty than normal would have to be constructed even to enable scows to load....

(3) Freight charges on such a bulky cargo as lime would be high and consequently prohibitive....

(4) The cost of machinery essential for milling and grading the limestone, together with a kiln in which to burn the processed material would be extremely high....

(5) The deposit is too far from places where it would be used....

(6) The thickness of sandy overburden is greater than the deposit itself to the north of F....

(7) No more than 360 cubic yards of surface limestone and 5,000 cubic yards of unconsolidated limestone are available for exploitation....

..... this deposit does not warrant economic exploitation. However, it is suggested that this limited source of agricultural lime be used locally. Manual excavation is possible, due to the greater part of the deposit being in an unconsolidated state.

IX. ACKNOWLEDGMENTS.

I am indebted to Mr. J. Clement of Fitzroy for kindly arranging my accommodation while engaged in this work.

*R. J. Adie*

R. J. Adie.

Geologist.



APPENDIX.

TO: GOVERNOR.

Interim Report 18 April.

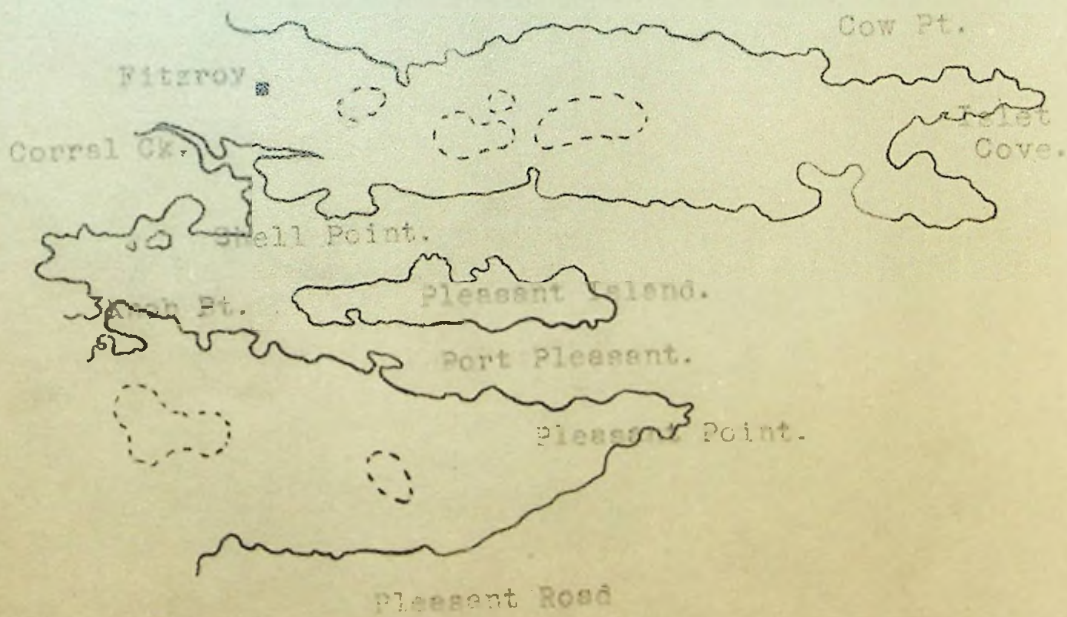
Recent limestone deposit at Shell Point Fitzroy exhaustively examined and mapped in detail. Found to be of very limited extent with maximum thickness of 2 feet 6 inches. Lithified limestone similar to specimens supplied by agricultural officer only superficial and 4 to 6 inches thick. Subsurface deposit soft and uncemented. Definitely does not warrant economic exploitation but suitable for local limited use.

Para 2. At Goose Green en route Pyramid and Seal Coves.

= Adie.

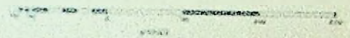









Map I. Fitzroy area showing position of Shell Point.



# GEOLOGICAL SKETCH MAP OF SHELL POINT, FITZROY.

Scale - 1:4000



- KEY
-  Sandstone
  -  Whitestone Limestone
  -  Gneiss schists
  -  Lignite table
  -  Dip of strata
  -  Dip of profile
  -  Points of level
- op. contour interval.





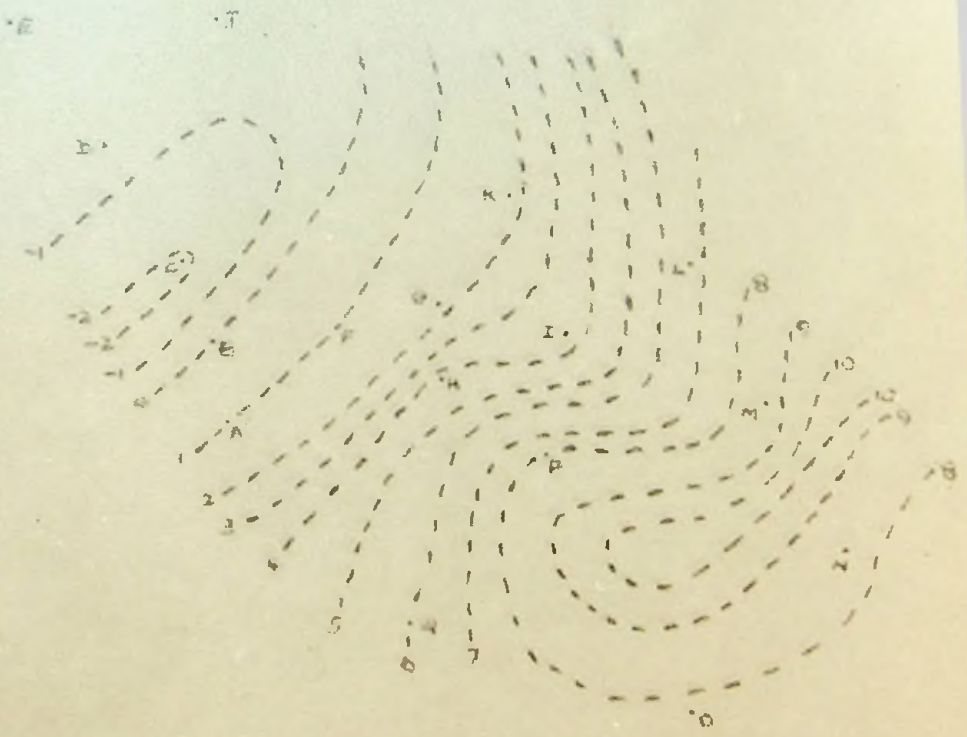
Map III. Detailed topography of area where lines  
present.

Contours at 1 foot intervals.





Map IV. Interpretation of bottom of deposit.  
Contours at 1 foot intervals.

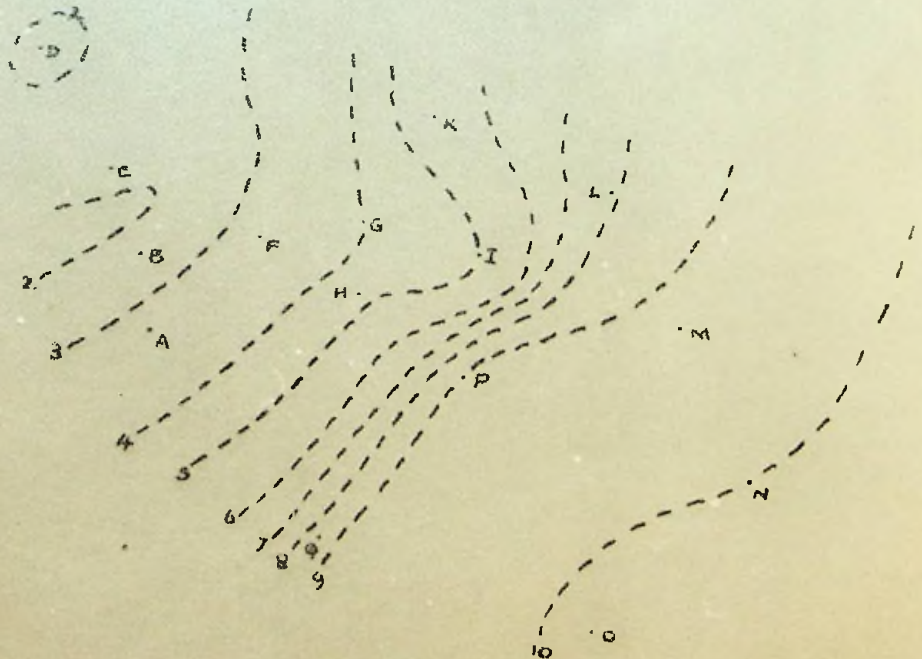


Map V. Interpretation of top of deposit.

Contours at 1 foot intervals.

E.

J.



R

CS  
S/F. MB

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I am much indebted to Mr. Adie for  
very thorough report - and my gratitude is none the  
less because he has blown Menrs Joyce & Baston (Jason & [unclear])  
into the middle of the Berkeley Sound. Please send  
a formal letter of appreciation. I have passed Map II  
puzzisimally in my char. case - it is too [unclear] (good) for  
to be buried away in a Secretarial file.

2. Please let D.O. see the report; he might be  
useful in [unclear] [unclear].

MC. 3/v

Maps 1-5 removed for copying 4/5/60 by MB Adie.  
P.S.



9

10th May,

50.

Sir,

I am directed by His Excellency the Governor to convey to you an expression of his gratitude for your recent report on the Limestone Deposit at Shell Point in Fitzroy Camp, which he has read with great interest.

I am,

Sir,

Your obedient servant,

(Sgd) Michael R. Raymer

COLONIAL SECRETARY.

R.J. Adie, Esq.,  
STANLEY.

A.O.

Ref: H.E's minute at 8. To see report from h.2.

1

13 MAY 1950

H.E.S.

Seen Thankyou.

John P. Oliver.  
H.O. 15/5/50

BU  
31/5/50

SURVEY VESSEL "JOHN BISCOE" 11

FALKLAND ISLANDS

DEPENDENCIES SURVEY.

1st June 1950.

Sir,

Herewith duplicate copy of report, which  
is to be sent to Colonial Office,  
according to His Excellency's instructions.

I am, Sir,

Your obedient servant,

-Hadie.

The Colonial Secretary,  
Secretariat,  
Stanley.



F. I. ref:

C. O. ref: 0221/A

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SAVING TELEGRAM.

*From:* The Officer Administering the Government of the Falkland Islands.

*To:* The Secretary of State for the Colonies.

*Date:*

7th JANUARY, 1950.

No. 88

COLONY.

22

By Saving Telegram No. 103 of the 3rd November, 1947.  
Time Deposits.

1-7

I attach herewith for your information a copy of a geological report prepared by Mr. R. J. Adie on a recent limestone deposit at Shell Point in the Fitzroy area of the East Falkland Islands.

OFFICER ADMINISTERING THE GOVERNMENT.

*Adie*

PM.