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**THE 1946 ERUPTION OF NIUAFO'OU,
KINGDOM OF TONGA:
WAS AN EVACUATION REALLY WARRANTED?**

Paul Taylor

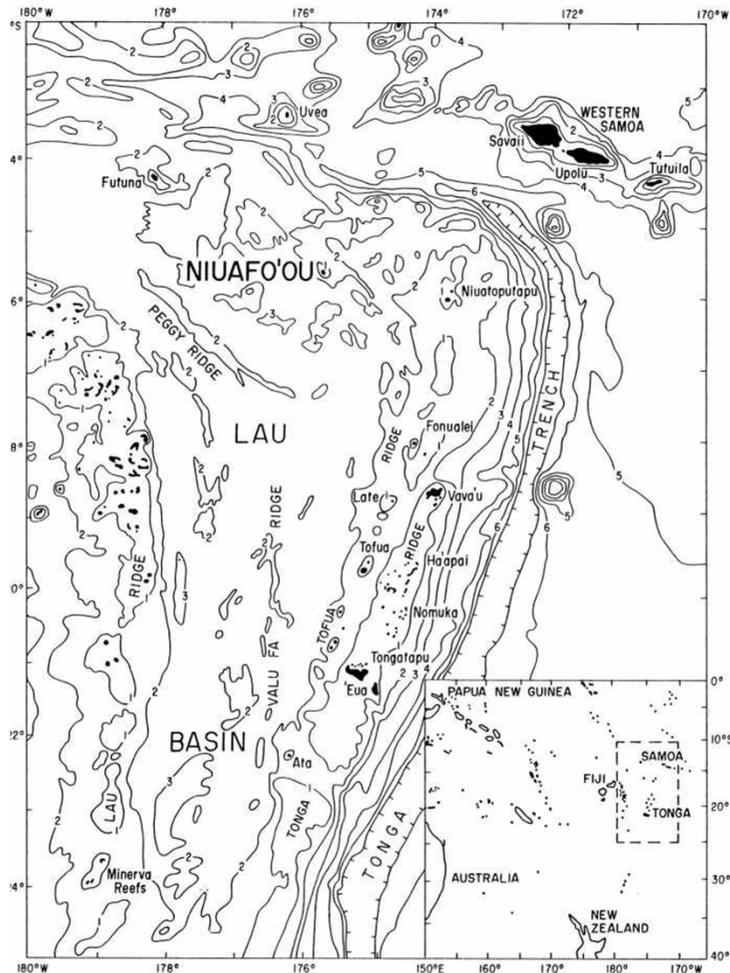
Disaster Reduction Programme
Geoscience Division

What the presentation will cover



- **Background to Niuafo'ou**
- **Eruptive history**
- **Affects of past eruptions**
- **The 1946 eruption:**
 - **Eruptive chronology**
 - **Effects of the activity**
 - **Post-eruption chronology**
 - **Issues associated with the evacuation**
- **Concluding comments**

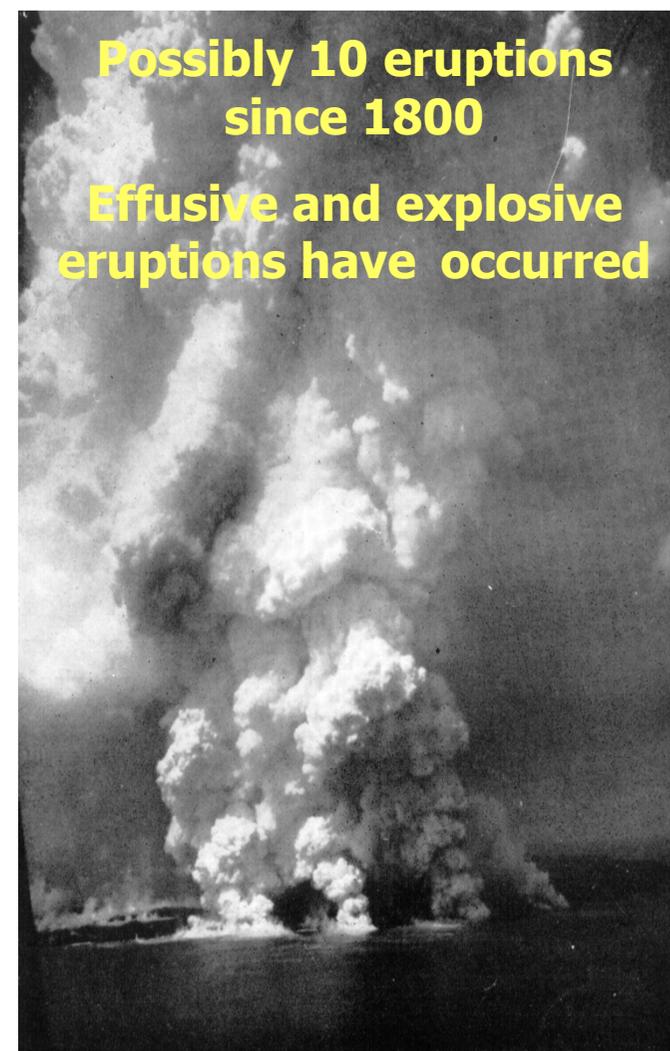
Niuafou'ou Volcano



- Niuafou'ou is an active volcanic island, 8 km in diameter, with a history of recent eruptions
- It has a population of about 800, living in 8 villages on the N & E flanks
- It is the most remot island of Tonga, situated 450 km NNW of the capital Nuku'alofa and 130 km from its nearest neighbour Niuatoputapu
- Geologically, it is quite distinct from surrounding areas.

Eruption	Character	Location
1814	Explosive	Within the caldera, location unknown.
1840	?	Location and character unknown.
1853	Effusive	SW flank; 'Ahau village destroyed.
1867	Effusive	SSW flank.
1886	Explosive	Within the caldera, NE side behind the village of Mata'aho.
1912	Effusive	W flank, south of Futu village.
1929	Effusive	W flank; Futu village and arable land destroyed.
1935-36	Effusive	S flank; Petani village threatened, relocated as a result of eruption.
1943	Effusive	SW flank; most crops destroyed.
1946	Effusive	N flank; Angaha village destroyed, island completely evacuated December 1946; not resettled until 1958.
Intermittent	Fumarolic	Hot springs and H ₂ S issuing at Vai Kona; springs not active 1958, active December 1982-January 1983, active August 1984.
1985	?	Earthquake swarm 21-22 March, 250 metre crack/ fissure near Fata'ulua village, small pumice/scoria raft present on caldera lake.

Recent Volcanic History



Effects of the Activity

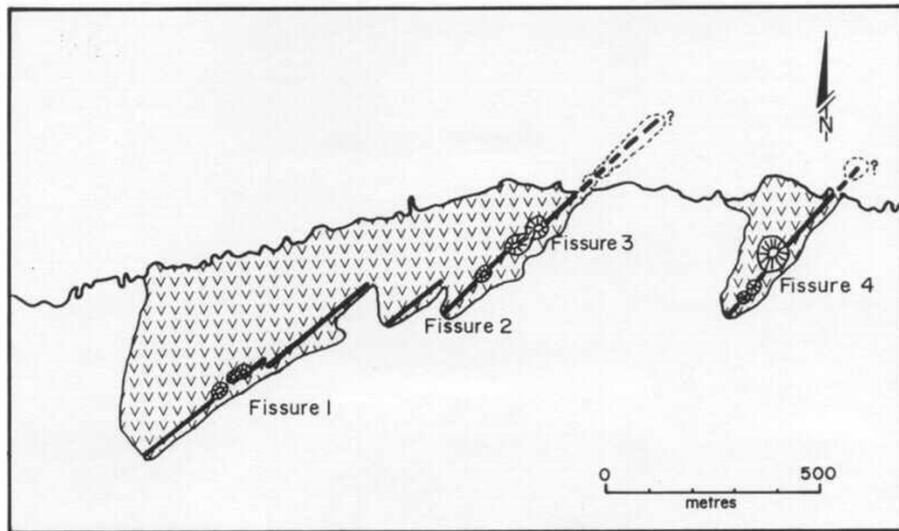
- Deaths of villagers - 1853 and 1886? eruptions
- Destruction of and damage to villages - 1853, 1886, 1929 and 1946 eruptions
- Destruction of valuable lands/crops - most eruptions
- Relocation of village - *Petani* after 1935/36 eruptions
- **1946** - *Angaha* village partially destroyed. Island evacuated Dec 1946. Population resettled in other parts of Tonga. Island resettled (with government reluctance) 1958.

1946 Eruption: Chronology



9 Sept	19:00	Detonations followed by two earthquakes
	19:02	Frequent tremors
	19:30	Tremors continue
	20:00	Tremors more frequent, increasing in strength
	20:08	Evacuation of Angaha begins
	20:12	Strong earthquake
	20:15	Effusive activity to the west of Angaha; lava fountaining, voluminous outpouring of lava
	20:20	Fissure opens in Angaha; evacuation continues; lava fountaining; numerous active vents
	23:00	Ashfall mixed with rain occurs along the north coast
10 Sept		Effusive activity continues: numerous detonations and continuous tremors
	10:00	Three craters active in Angaha; nine active along the coast west of Angaha; active vents extend out to sea west and east of Angaha
	12:00	Voluminous lava effusions may have ceased; numerous small aa flows produced
11 Sept		Explosive activity forms 'Alelea cinder cone
11 Sept		Intermittent activity; frequent tremors continue
12 Sept		No activity; frequent tremors continue
13-16 Sept		Occasional activity; strong intermittent tremors continue (up to 4-5 per day)
17 Sept		Weak intermittent activity; mainly vapour emissions
18 Sept		No activity: tremors continue
19-28 Sept		Tremors continue
01-02 Oct		Occasional tremors continue
03 Oct		No earth tremors
15 Oct		Mild earth tremor; no further activity reported

1946 Eruption: Location & Character



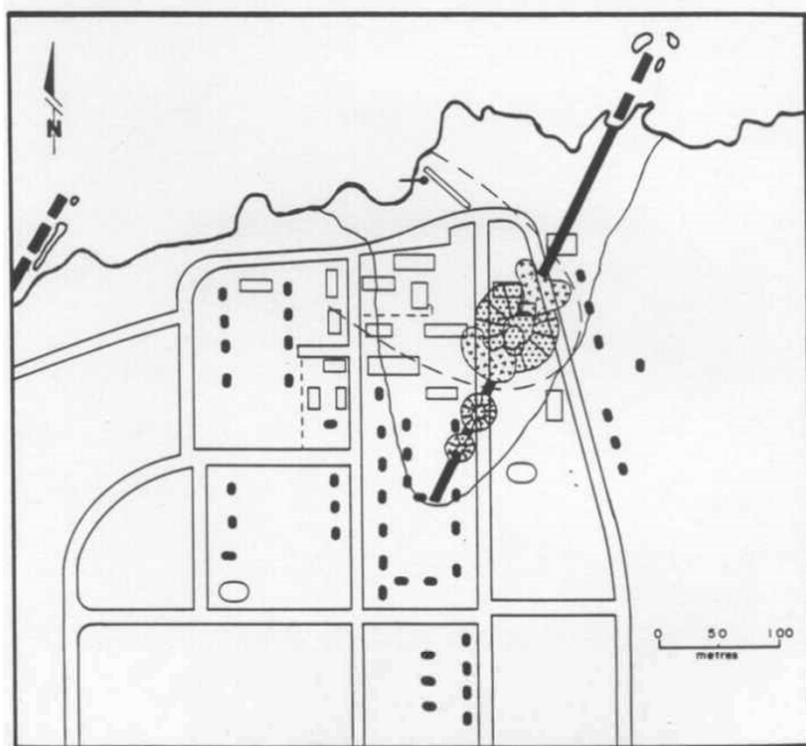
North coast of Niuafo'ou
and 1946 lavas

Spatter cone formed in
centre of Angaha village



Lava flows and channels in
centre of Angaha village

1946 Eruption: Angaha Village



Cones and lavas in Angaha village



Remains of the government wireless station in Angaha village



Remains of another building in Angaha village

1946 Eruption: Remains of Angaha Landing



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1946 Eruption: Post-Eruption Events



- 09 Sept Loss of communications with Niuafou'ou.
- 16 Sept Government requests flight to investigate, plane reported eruption and destruction of part of Angaha village.
- 17 Sept Ship dispatched with supplies and several Government officials.
- 20 Sept Supply ship arrived Niuafou'ou. **Minister of Lands assessed situation “*there is no immediate danger*”.**
- 23 Sept Radio communications resumed with Nuku'alofa.
- 28 Sept **Father Schahl (a Niuafou'ou RC priest) reported to officials he “*was quite satisfied that the island must be evacuated as soon as possible...*”**
- 30 Sept During week commencing, the Privy Council inaugurated the Niuafou'ou Evacuation Committee (NEC).
- 04 Oct **NEC did not agree on “*the need to evacuate*”.** Niuafou'ou officials requested to conduct plebiscite to determine wishes of Niuafou'ou people.
- 05 Oct **Plebiscite conducted, heads of households voted. “*1,078 wish to leave, 288 wish to remain*”??** Government decides on complete evacuation.
- 09 Oct **Government order for “*general evacuation as soon as boats can be chartered*”.**
- 17 Oct Evacuation Ordinance No 4 of 1946 enacted by Privy Council.
- Nov Preparation for evacuation.
- Dec Evacuation preparations continue.
- 21 Dec Last boat leaves Niuafou'ou with remaining evacuees. Evacuation complete.

The Evacuation Ordinance

Tonga. No. 4 of 1946.



An Ordinance

TO CONFER UPON HER MAJESTY IN COUNCIL CERTAIN
POWERS TO EVACUATE PERSONS FROM ONE PART OF
THE KINGDOM TO ANY OTHER PART.

[17th October, 1946]

BE IT ENACTED by the Queen and the Privy Council of the Kingdom
of Tonga as follows :—

- 1.** This Ordinance may be cited for all purposes as the Evacuation Ordinance, 1946. **SHORT TITLE.**
- 2.** On any occasion Her Majesty in Council may, in the interest and for the welfare of any particular body of persons residing within the Kingdom, by Order in Council order the complete or partial evacuation of that body of persons from its normal place of residence to any part of the Kingdom. **POWER TO ORDER EVACUATION.**
- 3.** Whenever Her Majesty in Council shall order the complete or partial evacuation of any body of persons, as provided by section two of this Ordinance, Her Majesty in Council shall appoint one or more persons to be the Competent Authority for Evacuation. **COMPETENT AUTHORITY FOR EVACUATION.**
- 4.** The Competent Authority shall have the general management and control of the evacuation named in any such Order in Council, and for that purpose may— **POWERS AND DUTIES OF COMPETENT AUTHORITY.**
- (a) make such rules as it thinks necessary for securing the satisfactory, expedient and comfortable evacuation named in the Order in Council ;
- (b) requisition property, for the purposes of the evacuation in the district or area to be evacuated, or partially evacuated ;

Evacuation Ordinance—4 of 1946

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- (c) apply any money received by it from the Treasurer in defraying any of the legitimate expenses of the evacuation ;
- (d) subject to the provisions of this Ordinance do such other things as appear to it to be necessary or expedient for furthering the interests and well-being of the evacuated persons during the course of evacuation and resettlement.

TREASURER TO ADVANCE MONEY FOR EFFECTING EVACUATION.

5. For the purpose of effectively carrying out any such Order in Council the Treasurer shall, on the Authority of the Competent Authority, advance money from Public Funds for the transport, accommodation, maintenance and care of persons so evacuated.

LIMITATION.

6. Any such Order in Council shall remain effective until it be rescinded by Her Majesty in Council.

PENALTIES.

7. Any person who fails to carry out the provisions of any such Order in Council, or any order, rule or instruction given by the Competent Authority thereunder, shall be guilty of an offence, and shall be liable to a fine not exceeding fifty pounds or to imprisonment for a term not exceeding two years, or to both such fine and imprisonment.

SALOTE TUPOU

BY AUTHORITY :

R. S. SKEEN, Government Printer, Nuku'alofa, 1946

Was The Evacuation Necessary?



Geological Considerations:

- Relatively minor eruption, limited effect on the island surface, confined to small area along north coast.
- Majority of activity occurred during initial 2 days of eruption.
- No deaths or serious injuries resulted from eruption.
- No records of a geological/volcanological assessment are known.

Geopolitical Considerations:

- Niuafou'ou most isolated island in the Tongan Group with no safe anchorage.
- 3-4 day boat trip to island from Nuku'alofa.
- Difficult to provide and maintain services.
- Government village of Angaha was only village affected.
- All government services were destroyed.
- Possibility of future eruptions.

Was The Evacuation Necessary?



Economic Considerations:

- Government financial resources required to re-establish services would be considerable.
- Some Niuafo'ou people may have used the opportunity for personal gain, much better opportunities in Nuku'alofa.
- Loss of copra to the value of £20,000 (1946 value).
- In terms of copra production, Niuafo'ou had highest yield compared to other islands in the Group.
- Copra was the only cash crop.
- Loss of majority of belongings (including livestock) of evacuees.
- Several Nobles did not wish to leave.

**Evacuation was probably not warranted
most likely based on political considerations!**

Niuafo'ou Today



Thank You