COMMONWEALTH OF AUSTRALIA.

DEPARTMENT OF NATIONAL DEVELOPMENT.

BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS.

RECORDS.

RECORDS 1959/31.

A NOTE ON THE GEOLOGY OF THE AEWO-SIRORATA AREA

by

H.L. Davies.

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INTRODUCTION

The Aewo-Sirorata area lies between Kokoda and Popondetta in the Northern District of Papua within latitude 9° south and logitude 148° east. Aewo village is 23 miles by road from Kokoda and 22 miles by road and foot-track from Popondetta.

The writer spent five days in the area in October 1958. Gold prospecting by natives on Aewo and Embeta Creeks was investigated and a traverse made to the south-east through Sirorata. Sample localities were plotted on aerial photographs (Popondetta, runs 3A and 4) and later transferred to Plate 2 which was prepared from a rough compilation at photo-scale; approximately 1 : 46,000.

The area is drained by the Kumusi River and its tributaries, notably the Luwuni River and Ipoi, Aewo and Ilimo Creeks. The Ajura Kujara Range lies to the north-west, Mt. Lamington to the north-east and the Owen Stanley Range to the south and south-west.

In the south of the area is the prominent ten thousand foot peak Akera Umbare, which may be Mt. Monckton.

The annual rainfall is approximately 130 inches, the drier part of the year being from May to September, during the south-east monsoonal season.

GEOLOGY

A. Stratigraphy

The four main rock-groups in the area are:-

1. The Owen Stanley Metamorphics (Palaeozoic).
2. The Ajura Kujara Igneous Complex (Lower Tertiary).
3. The volcanics, including Pleistocene bedded ejecta and lava, and recent alluvial volcanic material.
4. The recent alluvial and piedmont deposits derived mainly from the Owen Stanley Range.

1. The Owen Stanley Metamorphics consist chiefly of schist and gneiss with acid intrucives including vein quartz, and most recently, intruded by dolerite. The group is probably bounded by the Owen Stanley Fault.

2. The Ajura Kujara Igneous Complex consists of basic and ultrabasic igneous rocks and is a part of the Papuan Ultra-basic belt. The rock-types noted were serpentinised dunite and harzburgite (sample P.238), brecciated dunite with secondary silica and some nickel silicate fracture fillings (Samples P. 239, P.240) minor pyroxene-rich gabbro (P.236) and quartz dolerite (P.232).

Further west, in the Yodda Valley, the complex is seperated from the Owen Stanley Metamorphics by a block of younger sediments, the Kemp Welch (?) Series (Davies 1958). In the Aewo-Sirorata area it appears to extend right to the Owen Stanley Fault, though the contact has not been seen.

E. R. Stanley (1917) recorded peridotite higher on the Mamama River. It appears that the ultrabasic belt continues from the Ajura Kujara Range towards Musa Valley,

being largely concealed by Pleistocene and recent volcanics and alluvia in the Aewo-Sirorata area.

3. Volcanics - There are two groups of volcanic rocks in the area -

(i) The probably Pleistocene bedded ejecta and flows as exposed near the Asisi bridge (sample P.242) at Sirorata (sample P.241) and on Ipoi Creek (sample P.237); and

(ii) The recent deposits of tuff and alluvial volcanic material as exposed at Ajeka and on Ilimo Creek.

The Pleistocene material is distinguished by a moderate degree of lithification, and gentle folding with dips of about 10°. This apparent folding may be due to an irregular depositional surface though tectonic cause is favoured. The bedded ejecta comprise agglomerate, tuff and lava. The lava, as exposed at Sirorata, is of the Mt. Lamington type, being andesitic with phenocrysts of ferro-magnesian minerals.

The recent deposits of tuff and alluvial volcanic materials are unconsolidated and flat-lying and may, as at Ajeka, be interbedded with alluvial material from other sources notably the Owen Stanley Range. The tuff and those alluvial beds entirely composed of volcanic material originate from vents in the Mt. Lamington area, though only a very small proportion would be derived from the 1952 eruption.

4. Recent alluvial and piedmont deposits - The flat floor of the Luwuni Valley is composed of alluvial material derived mostly from the Owen Stanley Range. South of Ingi and Afa are the low Owen Stanley foothills with a marked consequent drainage. These comprise overlapping piedmont fans composed of unsorted angular metamorphic boulders of varying size with, commonly, a rock flour matrix. Similarly piedmont material containing ultrabasic rock fragments in a ferruginous clay matrix is seen of the outskirts of the ultrabasic hills. There are good exposures of this in both Embeta and Aewo Creeks. The division between this alluvial material and the alluvial volcanic material in Plate 2 is, in places, arbitrary, as the two may be interbedded.

B. Structure

The major structural feature is the Owen Stanley Fault, which is represented by a curving scarp along the front of the Owen Stanley Range. It is thought that the ultrabasic block was upthrust and tilted by movement along this fault. The most recent movement is the uplift of the Owen Stanley block which took place in Quaternary time.

The dunite breccia near Sirorata is probably of tectonic origin though there is no other evidence of faulting in the vicinity.

C. Economic Geology

1. Gold

In recent years natives have won a few ounces of gold from Embeta and Aewo Creeks, where they are at present ground-sluicing with poor results.

In the Yodda Valley, twenty miles to the west, gold was derived from the Owen Stanley Metamorphics. The rich patches occur as a result of resorting of the Yodda Valley alluvials by present-day streams; gold is not found in streams draining the adjacent Ajura Kujara Range. Observations in the Aewo area indicate that the situation is the same.

Streams draining from the ultrabasic hills are not gold-bearing. Streams draining the Owen Stanley Metamorphics or the Luwuni Valley piedmont and alluvium are, in places, gold bearing.

Thus Oi Creek, Iwarahe Creek and Upper Embeta Creek are not likely prospects. Aewo, Alora, Ijoi and other creeks to the westward all warrant prospecting. Streams to the eastward all contain volcanic material which masks or dilutes any gold-bearing alluvium.

On Aewo Creek, about three-quarters of a mile from Papaki No. 1 village, natives are, at present, engaged in desultory ground-sluicing.

Gold is being won from the banks of the stream, which are composed of old river wash. Higher near the Iwarahe junction, bedrock (sample P.236) is seen, but no gold is present, the overlying alluvium being mainly ultrabasic. Higher still the valley is narrower, being cut into Owen Stanely piedmont deposits, and there is little alluvium. Only a trace of gold was detected by panning in this area. As the Owen Stanley Fault is approached the river bed narrows and the amount of alluvium decreases. These higher reaches warrant more intensive prospecting.

The best prospects on Embeta Creek are in its lower reaches where the stream is dissecting the old Kumusi River alluvium.

Some of the natives, notably Hoi of Asisi No. 1 Village, have a sound practical knowledge of prospecting.

2. Nickel

The lateritic soils overlying the olivine-bearing ultra-basic rocks in the hills near Aewo and Sirorata are similar to those of the south-western flank of the Ajura Kujara Range and may contain concentrations of nickel. However, the area is too small for a lateritic nickel deposit of economic dimensions.

Garnierite, or nickel silicate, is, in some places, associated with the secondary silica veins which traverse the dunite breccia (samples P. 239 and P.240), and might be present in economic quantities.

ACKNOWLEDGEMENT

The assistance of Popondetta and Kokoda District Offices was greatly appreciated.

REFERENCES

1. Davies, H. L. 1958 - A reconnaissance of the Ajura Kujara Range (in preparation).

2. Stanley, E. R. 1957 - Geological expedition across the Owen Stanley Range. Annual Report for Papua for 1917-18.

An intersection of ore at depth in the South Alligator field would be an important advance and would give impetus to further testing of the known shoots at other mines on the area.

It is recommended that these diamond drill holes be bored to test for extension of the No. 2 orebody in depth or for repetition of the oreshoot. The holes should be sited as follows (see plates 2 and 4).

Proposed Hole No. 1:

Collar at 19526 W., 19700 N. Inclination of 70° on a bearing of 24° east of magnetic north.

Proposed intersection at 410 feet.

Proposed Hole No. 2:

Collar at 19669 W., 19714 N. Inclination of 70° on a bearing of 24° east of magnetic north.

Proposed intersection at 310 feet.

Proposed Hole No. 3:

Collar at 19400 W., 19714 N. Inclination of 75° on a bearing of 24° east of magnetic north.

Proposed intersection at 365 feet.

Hole No. 1 will test for an extension of ore 250 feet beneath its present known limit, and Holes No. 2 and 3 at 160 feet and 180 feet respectively.

If the results of the first hole warrant it the inclinations of the remaining two holes can be increased to give deeper intersections of the ore horizon.

If the drilling is successful, a new level should be opened beneath the No. 2 Adit.

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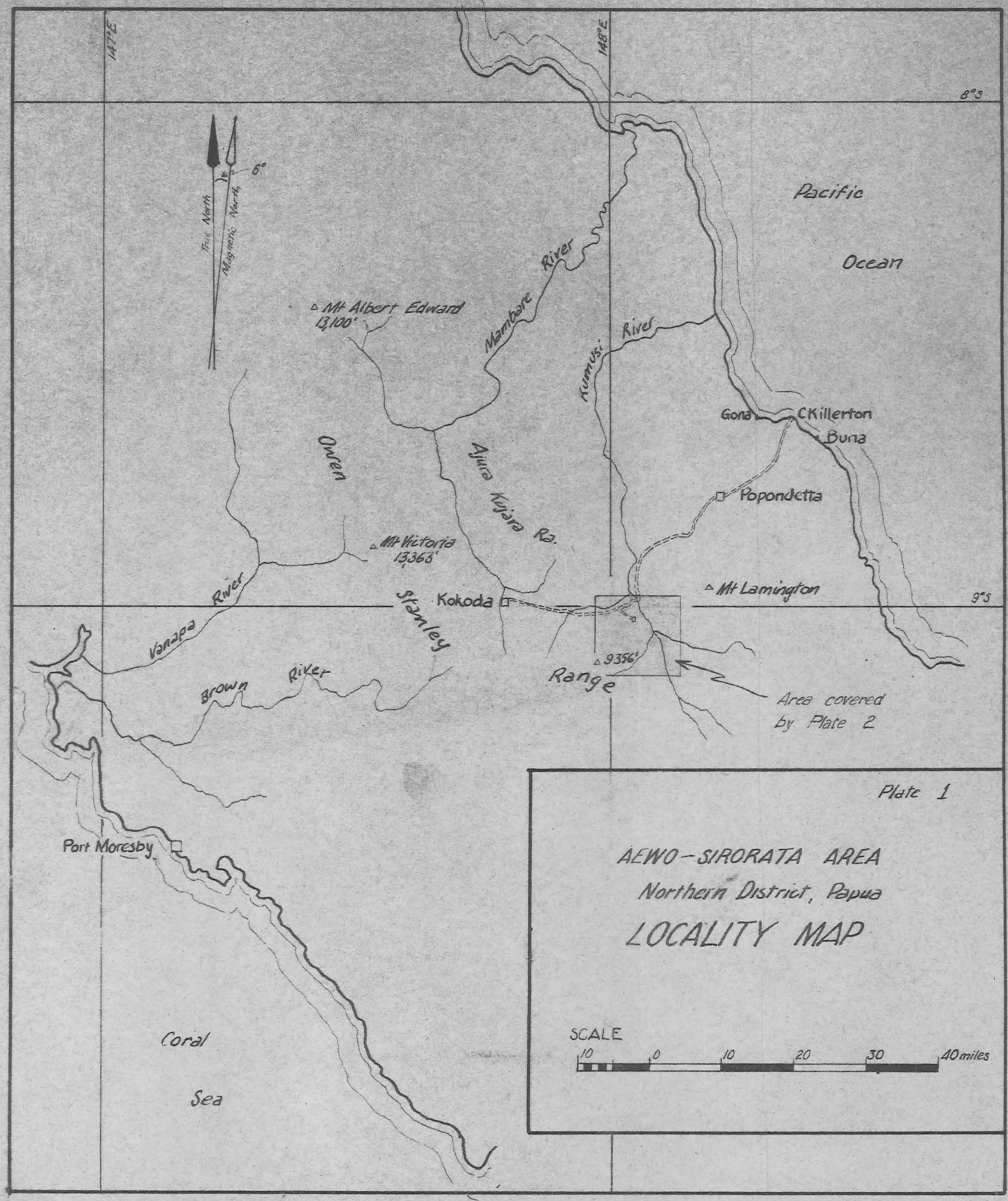
PRICHARD, C.E. 1958 - Report on a Quarterly Inspection of the South Alligator River Uranium Area, Northern Territory, May, 1958. Bur. Min. Resour. Aust. Rec 1958/-


147°E
148°E
8°S
9°S
True North
Magnetic North
6°
Pacific
Ocean
Mambare River
Kumusi River
Mt Albert Edward
13,100'
Owen
Stanley
Ajura Kujara Ra.
Mt Victoria
13,363'
Gona
C Killerton
Buna
Popondetta
Kokoda
Mt Lamington
Vanapa River
Brown River
9356'
Range
Area covered
by Plate 2
Port Moresby
Coral
Sea
Plate 1
AEWO-SIRORATA AREA
Northern District, Papua
LOCALITY MAP
SCALE
10 0 10 20 30 40 miles

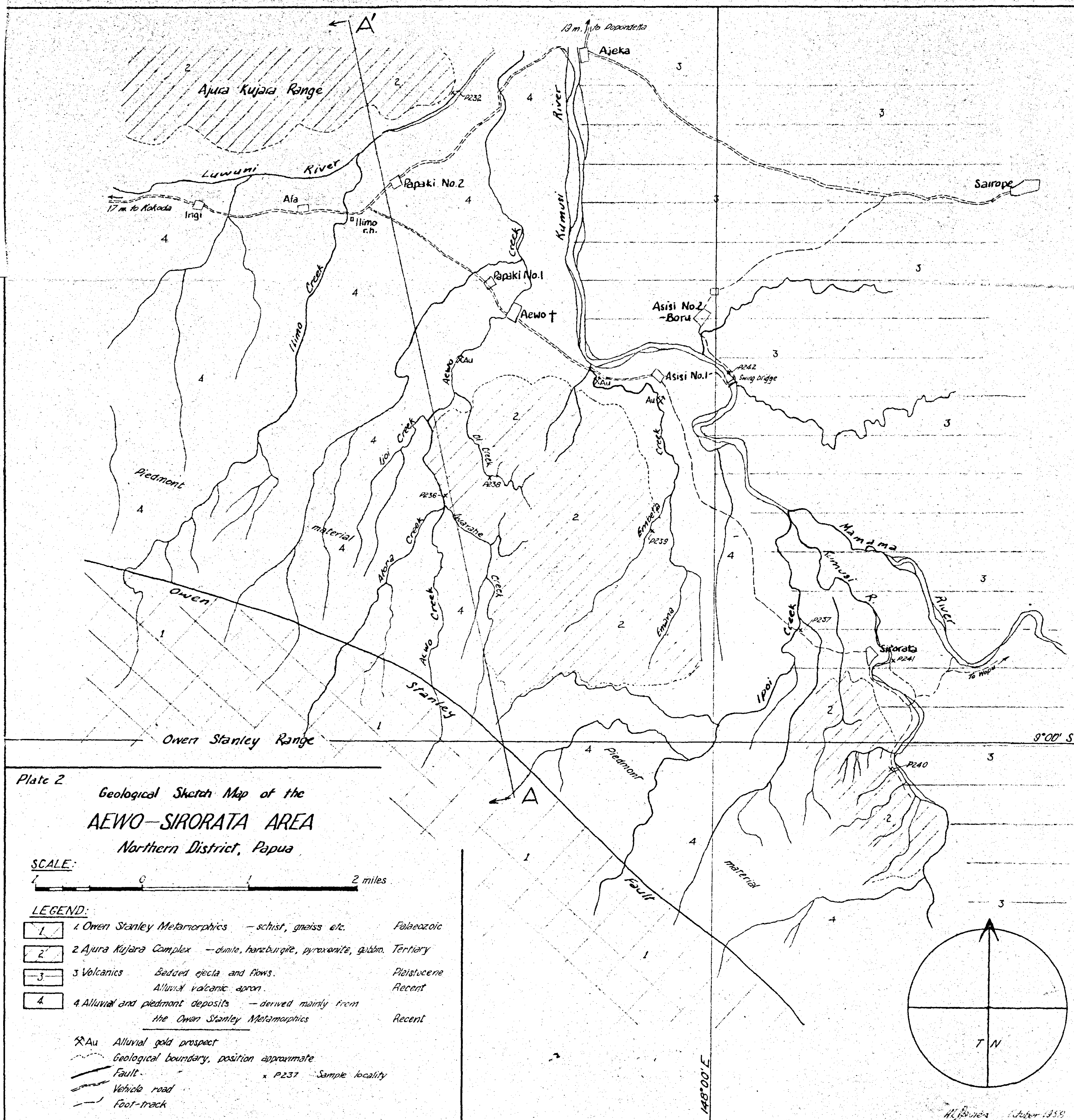


Plate 2
Geological Sketch Map of the
AEWO—SIRORATA AREA
Northern District, Papua
SCALE:
1 0 1 2 miles
LEGEND:
1. Owen Stanley Metamorphics — schist, gneiss etc. Palaeozoic
2. Ajura Kujara Complex — dunite, harzburgite, pyroxenite, gabbro. Tertiary
3. Volcanics Bedded ejecta and flows. Pleistocene
Alluvial volcanic apron. Recent
4. Alluvial and piedmont deposits — derived mainly from the Owen Stanley Metamorphics Recent
Au Alluvial gold prospect
Geological boundary, position approximate
Fault
Vehicle road
Foot-track
× P237 Sample locality
A'
A
19 m. to Popondetta
Ajeka
Ajura Kujara Range
P232
Luwuni River
Kumusi River
17 m. to Kokoda
Ingi
Afa
Ilimo r.h.
Papaki No.2
Papaki No.1
Aewo
Sairope
Asisi No.2 -Boru
Asisi No.1
P242
Swing bridge
Ilimo Creek
Aewo Creek
Ijoi Creek
Oi Creek
P238
P236
Iwarahe Creek
Embera Creek
P239
Emana
Piedmont
material
Akora Creek
Aewo Creek
Mamama River
Kumusi R.
Ipoi Creek
P237
Sirorata
P241
to Wapu
P240
Owen Stanley
Owen Stanley Range
Fault
Piedmont
material
9°00' S
148°00' E
T N
H.L. Davies October 1958

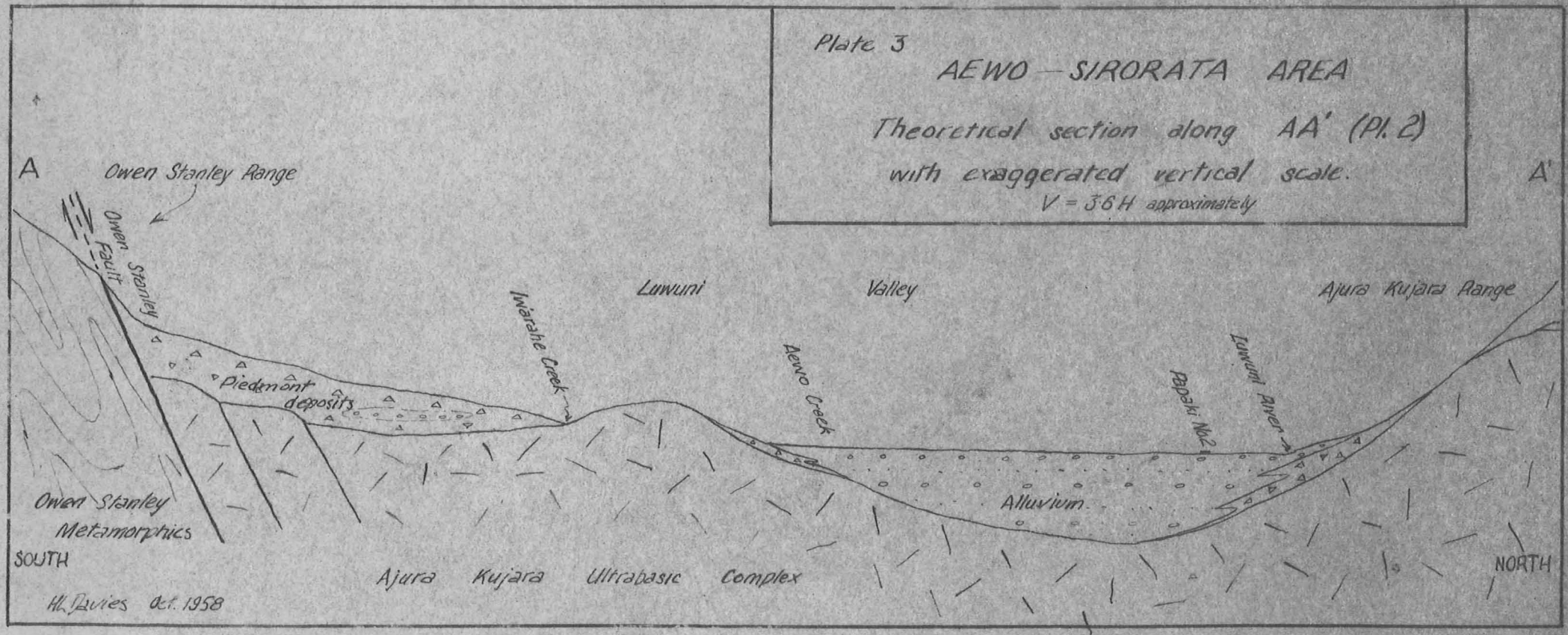


Plate 3
AEWO — SIRORATA AREA
Theoretical section along AA' (Pl. 2)
with exaggerated vertical scale.
V = 3·6 H approximately
A
A'
Owen Stanley Range
Owen Fault
Owen Stanley
Piedmont deposits
Iwarahe Creek
Luwuni
Valley
Aewo Creek
Papaki No2
Luwuni River
Ajura Kujara Range
Alluvium
Owen Stanley
Metamorphics
SOUTH
NORTH
Ajura Kujara Ultrabasic Complex
H.L. Davies Oct. 1958