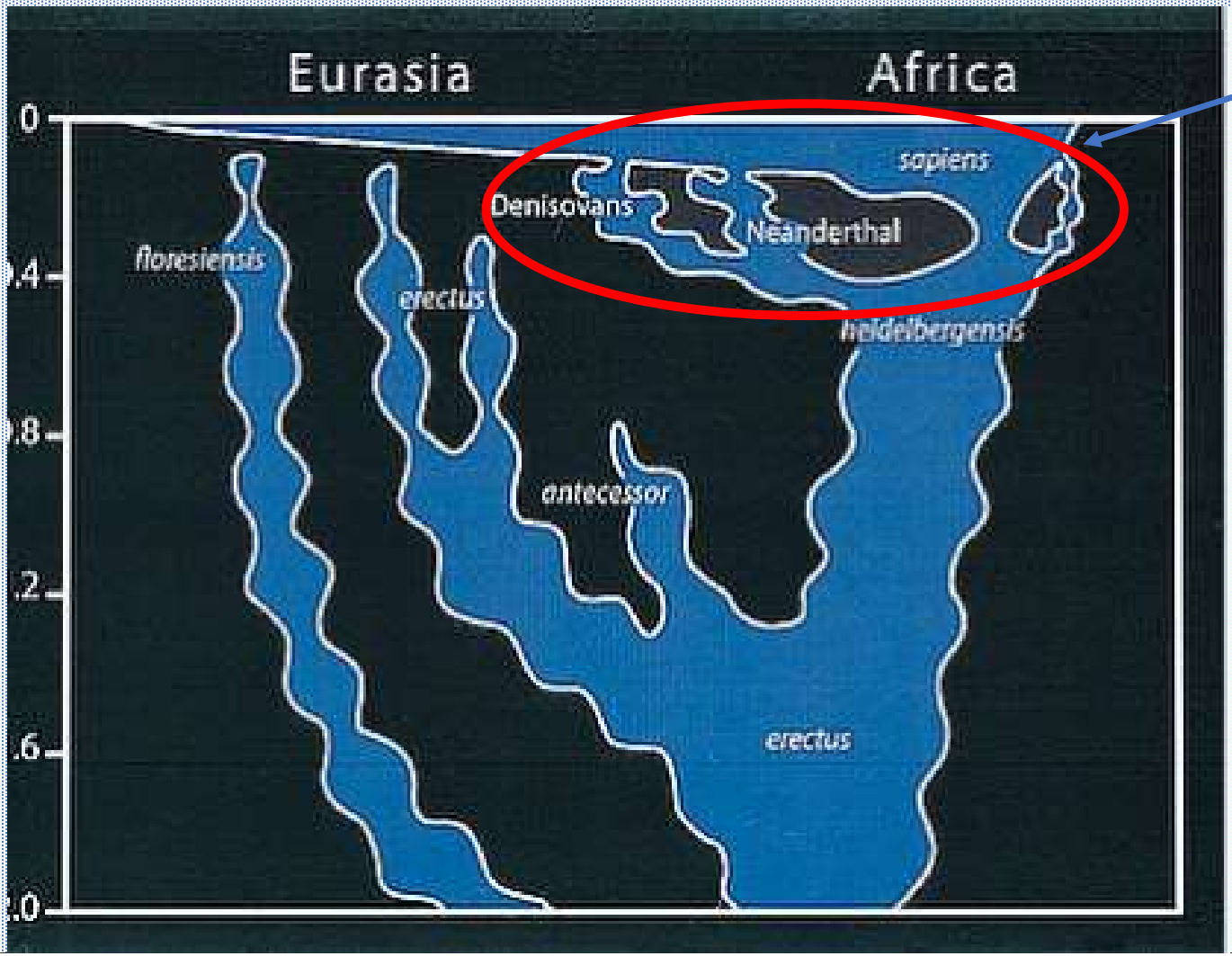
Polynesians – Where are they from?

Garry Law

Look three ways

- People in Asia known from fossils / pre-modern remains (bottom up)
- The modern people particularly language (top down)
- The archaeology and the genetics

Bottom Up



The realm of ancient DNA
Oldest recovered yet 430 K years

Asian Homo erectus

Java

- *Homo erectus erectus* (Java Man, 1.6–0.5 Ma) formerly *Pithecanthropus erectus*
- *Homo erectus soloensis* (Solo Man, 0.546–0.143 Ma)

China

- *Homo erectus yuanmouensis* (Yuanmou Man 1.7 Ma)
- *Homo erectus lantianensis* (Lantian Man, 1.6 Ma)
- *Homo erectus nankinensis* (Nanjing Man, 0.6 Ma)
- *Homo erectus pekinensis* (Peking Man, 0.7 Ma) formerly *Sinanthropus pekinensis*

Other archaic hominids in Asia

- *Homo neanderthalensis* – fossils and ancient DNA known as far east as Siberia

- Denisovan *Homo* – initially known from a tiny bone from Denisova cave in Siberia and more recently a new fragment from Tibet
  50-300K years ago.
  Genome fully known – appearance unknown – distribution little known

Neanderthals and Denisovans are related on DNA

?

"Dragon man" from China 146,000+ years old. No associated archaeology. No DNA. Is this a Denisovan?

Other archaic hominids in Asia

The uncertain ones

- *Homo florensis* "The Hobbit" from Flores in Indonesia from 190 K (?) to 50 K years ago. Tool maker. Dwarfed species. Ancestors had to have crossed a water gap to get to Flores. Ancestry seems to be deep in the story of Homo.
  No DNA recovered

- *Homo luzonensis* From Luzon in the Philippines 50 K years ago. Possibly a dwarfed species. Ancestors had to have crossed a water gap. Teeth and foot bones from three individuals. Ancestry uncertain.
  No DNA recovered

- DNA Traces of other extinct lines?

- Archaeology – no human remains.
  Sulawesi (Indonesia – across water gap): Stone tools from 194 to 118 K years ago.
  Luzon (Philippines – across water gap) Rhino butchery site, with stone tools 631 to 771 K years ago. NB These dates suggest they were *Homo erectus* not Denisovans

Modern Man *Homo Sapiens*

First emerged Africa ~ 280 K years ago

Spread to rest of world – one event or many?

Timing of out of Africa uncertain

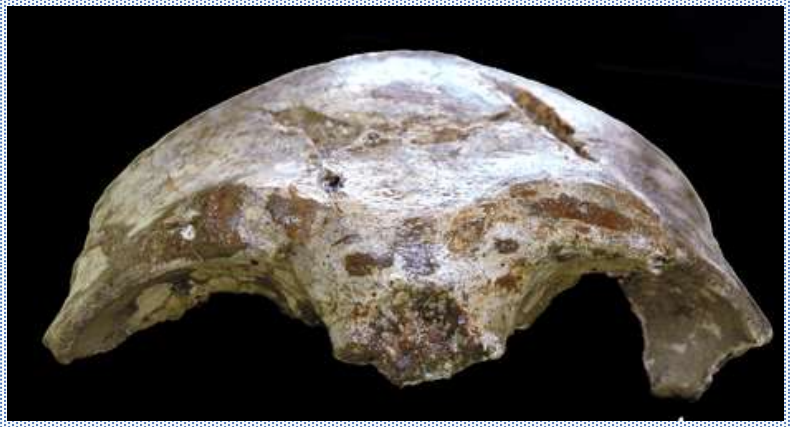
On Mt DNA could be as recent as 50 -70 K years ago

Fossil and archaeological evidence suggests could have been earlier - but there may have been multiple events

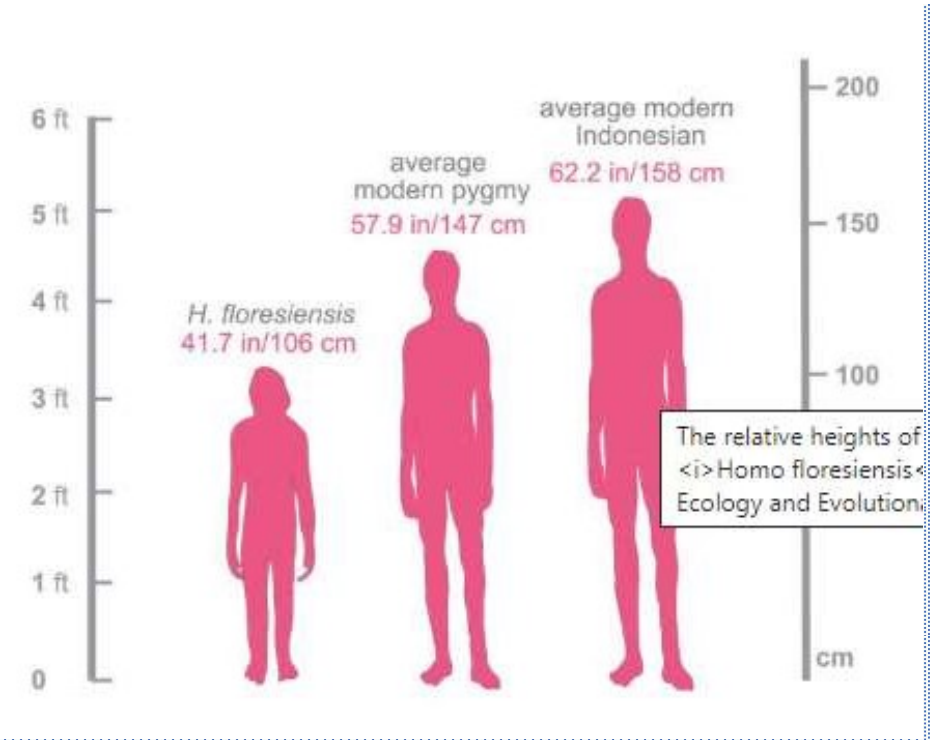
Fossil evidence in Asia very scarce.

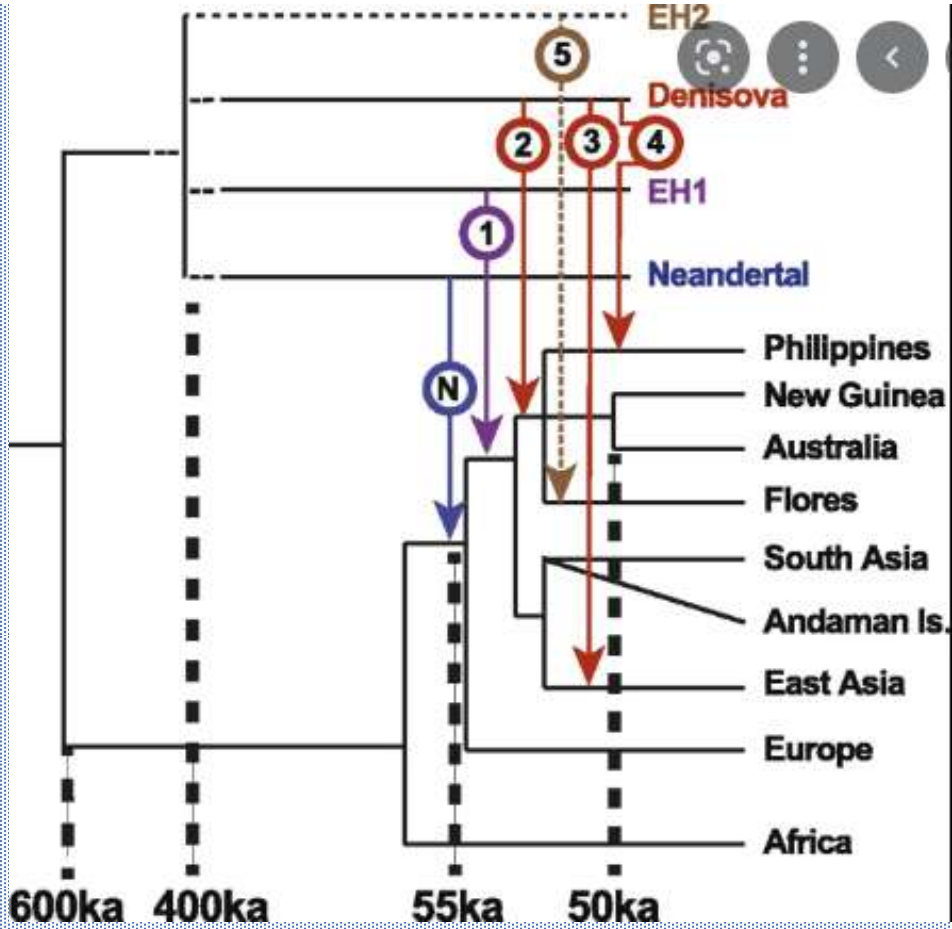
- Laos fossils
- Others claimed older but based on teeth alone which are poorly associated with H sapiens

Awash, Ethiopia ~160 K years ago



Tam Pa Ling, Laos ~63 K years ago – but some say were redeposited under flowstone of that age

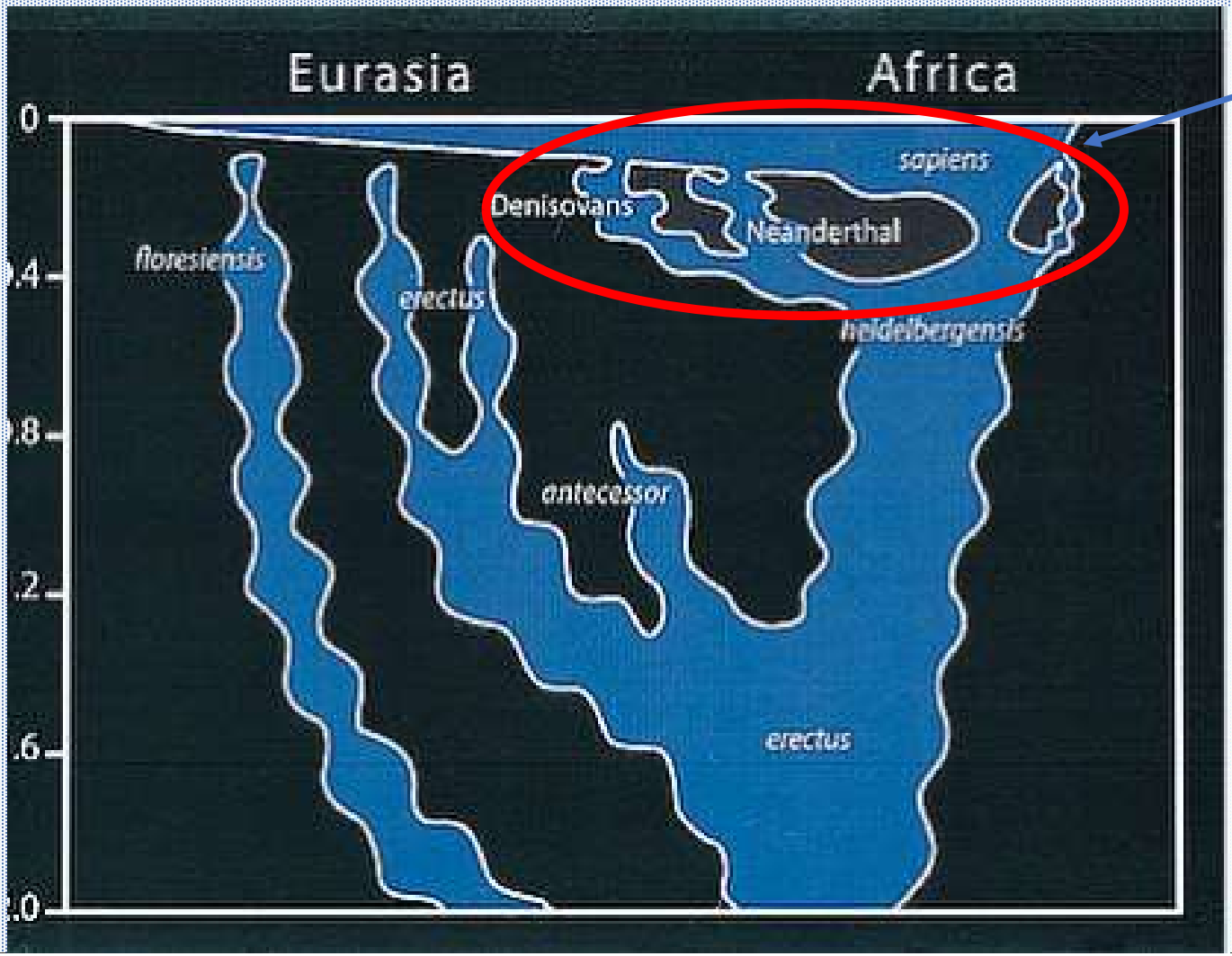




Homo floresiensis **('Hobbit')**
They were small!

DNA Relationships
Among modern SE Asians introgression from archaic humans is frequent.
However no Denisovan Y chromosome (Male) or Mitochondrial (Female transmitted) DNA seems to be expressed in modern populations
Where did introgressions take place? DNA cannot determine this – though some assert to know

Bottom Up



The realm of ancient DNA
Oldest recovered yet 430 K years

Top down:

The people of the islands had their own versions of their history

They commonly thought they were from somewhere else. First arrivals were often remembered.

In Polynesia a remembered ancestral place, Hawaiki (Maori version) was common and the name was reused as well (Hawaii)

Where Polynesians were in contact (e.g., Tonga / Samoa or Tahiti / Tuamotus or Tahiti / Cooks they recognised the language similarity and could communicate. Common history seen as obvious

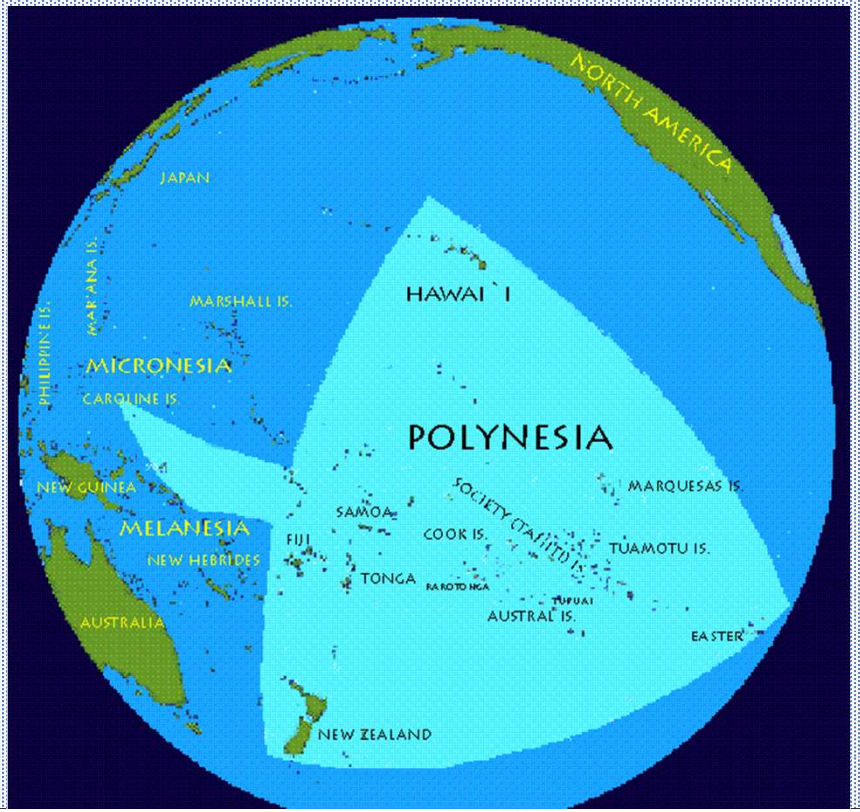
No written history or calendar

Typically had ancestor lines committed to memory - quickly transferred to a written record.

European and some indigenous students attempted to reconcile these within island group and between island records

Other European approaches was to set all the traditional history aside and concentrate on the empirical – the observables in material culture and language.

Obvious to the first widely travelled European explorers that the people of the eastern Pacific spoke similar languages, looked similar and often had similar customs.
1769 the Tahitian Tupaia with Cook demonstrated Maori and Tahitians could understand each other
Present restricted use of the term Polynesian was established by French explorer J. S. C. Dumont d'Urville in 1832.



	NORTHERN	SOUTHERN	OTAHITE
the Hair	*Macauwe*	*Heoooo*	*Roourou*
the Ear	*Terringa*	*Hetaheyei*	*Terrea*
the Forehead	*Erai*	*Heai*	*Erai*
the Eyes	*Mata*	*Hemata*	*Mata*
the Cheeks	*Paparinga*	*Hepapaeh*	*Paparea*
the nose	*Ahewh*	*Heeih*	*ahew*
the Mouth	*Hangoutou*	*Hegowai*	*Outou*
the Chin	*Ecouwai*	*Hekaoewai*	.....
the Arm	*Haringaringa*	.....	*Rema*
the finger	*Maticara*	*Hemaigawh*	*Maneow*
the belly	*Ateraboo*	.....	*Oboo*
the navel	*Apeto*	*Hecapeeto*	*Peto*
Come here	*Horomai*	*Horomai*	*Harromai*
Fish	*Heica*	*Heica*	*Eyca*
a lobster	*Kooura*	*Kooura*	*Tooura*
Coccos	*Taro*	*Taro*	*Taro*
Sweet potatoes	*Cumala*	*Cumala*	*Cumala*
Yamms	*Tuphwhe*	*Tuphwhe*	*Tuphwhe*
Birds	*Mannu*	*Mannu*	*Mannu*
No	*Aidaire*	*Aweare*	*Oure*
1.	*Tahai*	.....	*Tahai*
2.	*Rua*	.....	*Rua*
3.	*Toroo*	.....	*Torou*
4.	*Ha*	.....	*Hea*
5.	*Rema*	.....	*Rema*
6.	*Ono*	.....	*Ono*
7.	*Etu*	.....	*Hetu*
8.	*Warou*	.....	*Warou*
9.	*Iva*	.....	*Heva*
10.	*Angahourou*	.....	*Ahourou*
the teeth	*hennihu*	*heneaho*	*Nihio*
the Wind	*Mehow*	.....	*Mattai*
a theif	*Amootoo*	.....	*Teto*
to examine	*Mataketake*	.....	*Mataitai*
to Sing	*Eheara*	.....	*Heiva*
Bad	*Keno*	*Keno*	*Eno*
Trees	*Eratou*	*Eratou*	*Eraou*
Grandfather	*Toubouna*	*Toubouna*	*Toubouna*

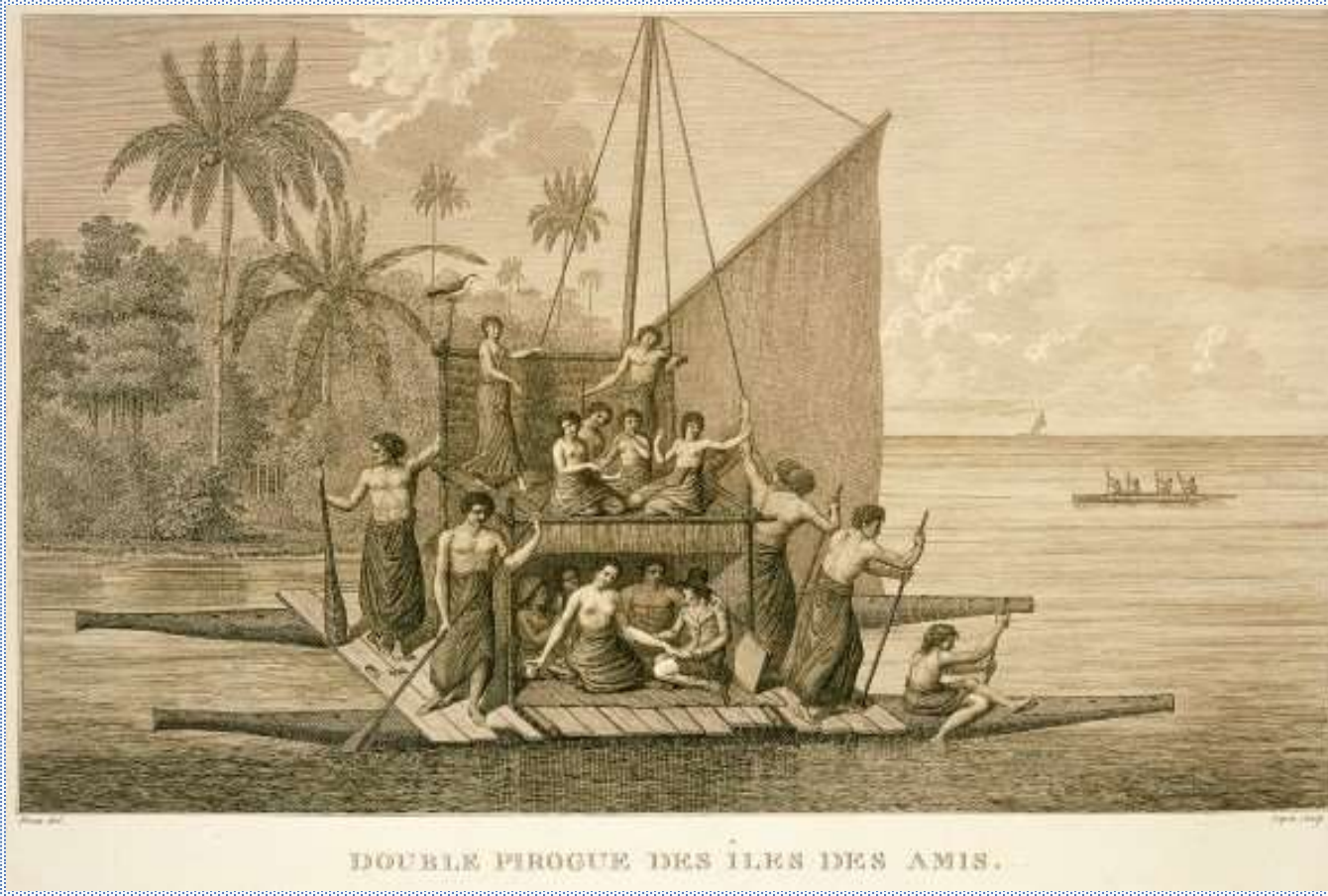
I must remark that the greatest part of the southern Language was not taken down by myself and I am inclind to beleive that the person who did it for me made use of more letters in spelling the

Joseph Banks Endeavour Journal – comparing Tahiti and North and South New Zealand Maori words.

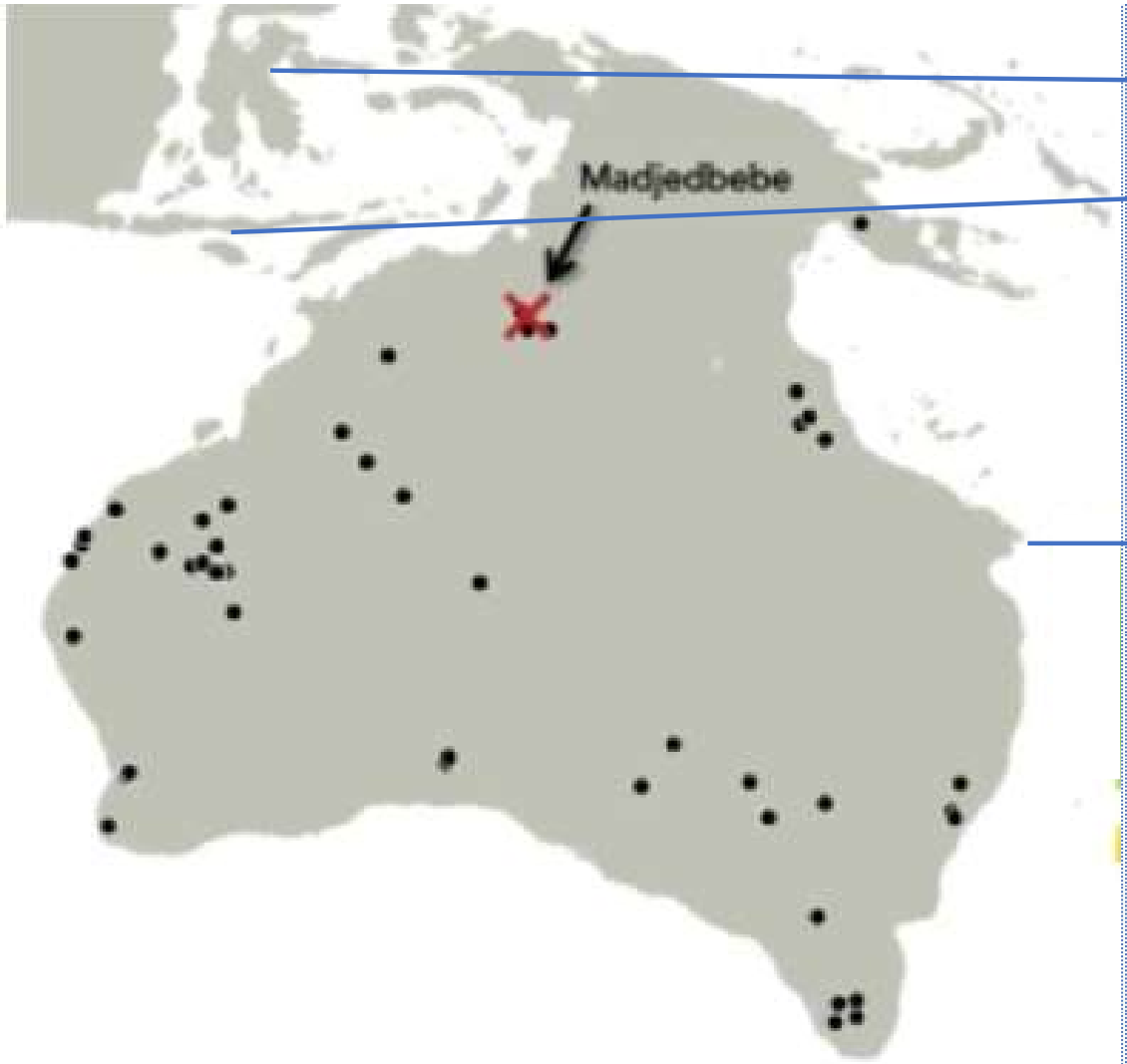
Much European based speculation over the years as to the origins of the Polynesians but it is only with archaeology, linguistics and genetics that it is finally being worked out.

Past ideas: Noble savages –

- **Prejudice against Asian and Melanesian relationships**
- **Aryan linkage?**
- **America alternative?**



New Arcadia?



Sulawesi

Flores

Australia: only modern people *Homo sapiens,* but an early date in relation to African departure.

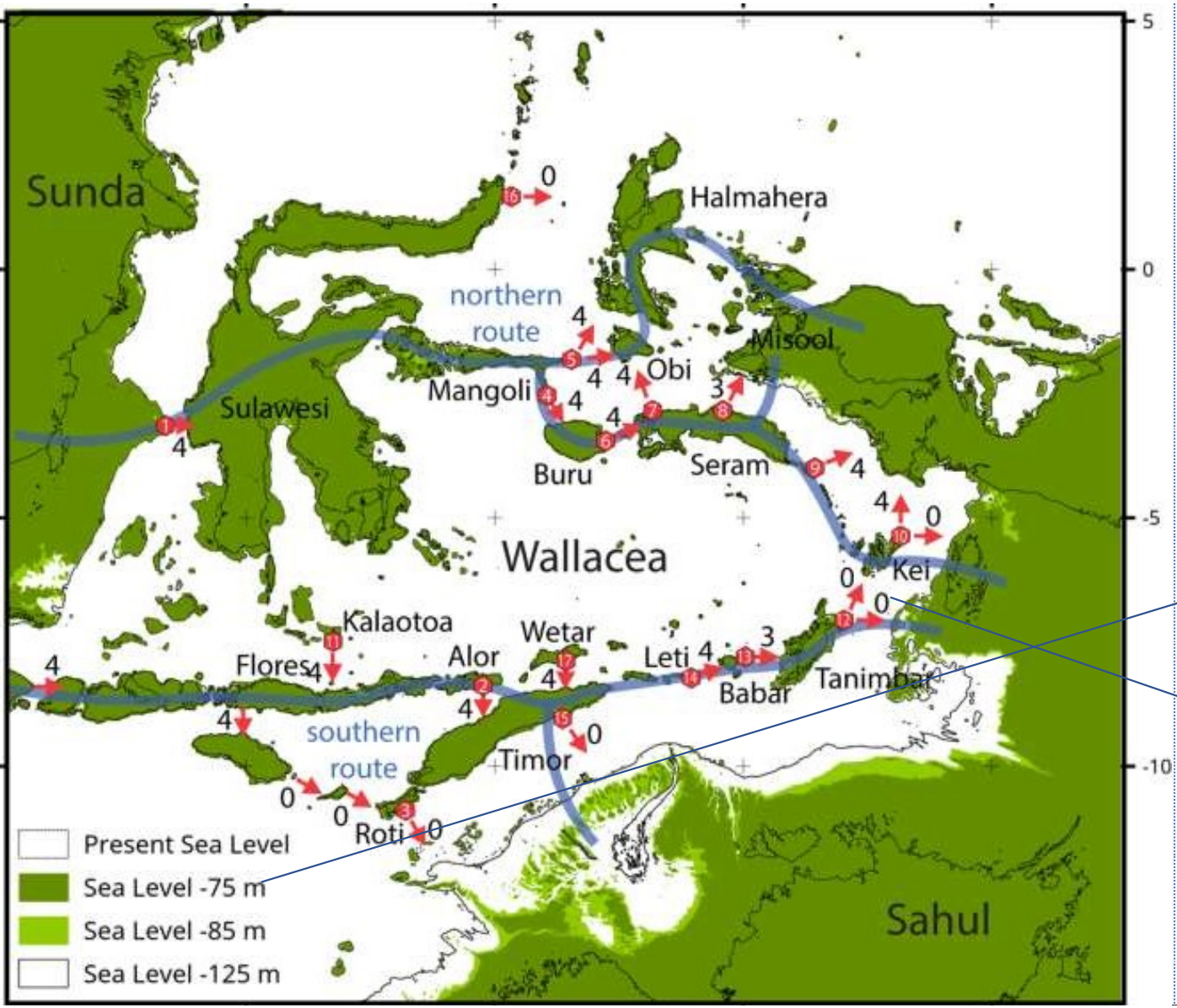
Late Pleistocene low sea stand, 20.000 years ago

* Sites older than 30,000 years

Madjedbebe is the oldest at ~65,000 years but is disputed as to being quite that old

Languages and genetics very diverse across this region (called Sahul). Far from certain they have a single ancient source.

Off map: Homo luzonensis 50,00 years ago.



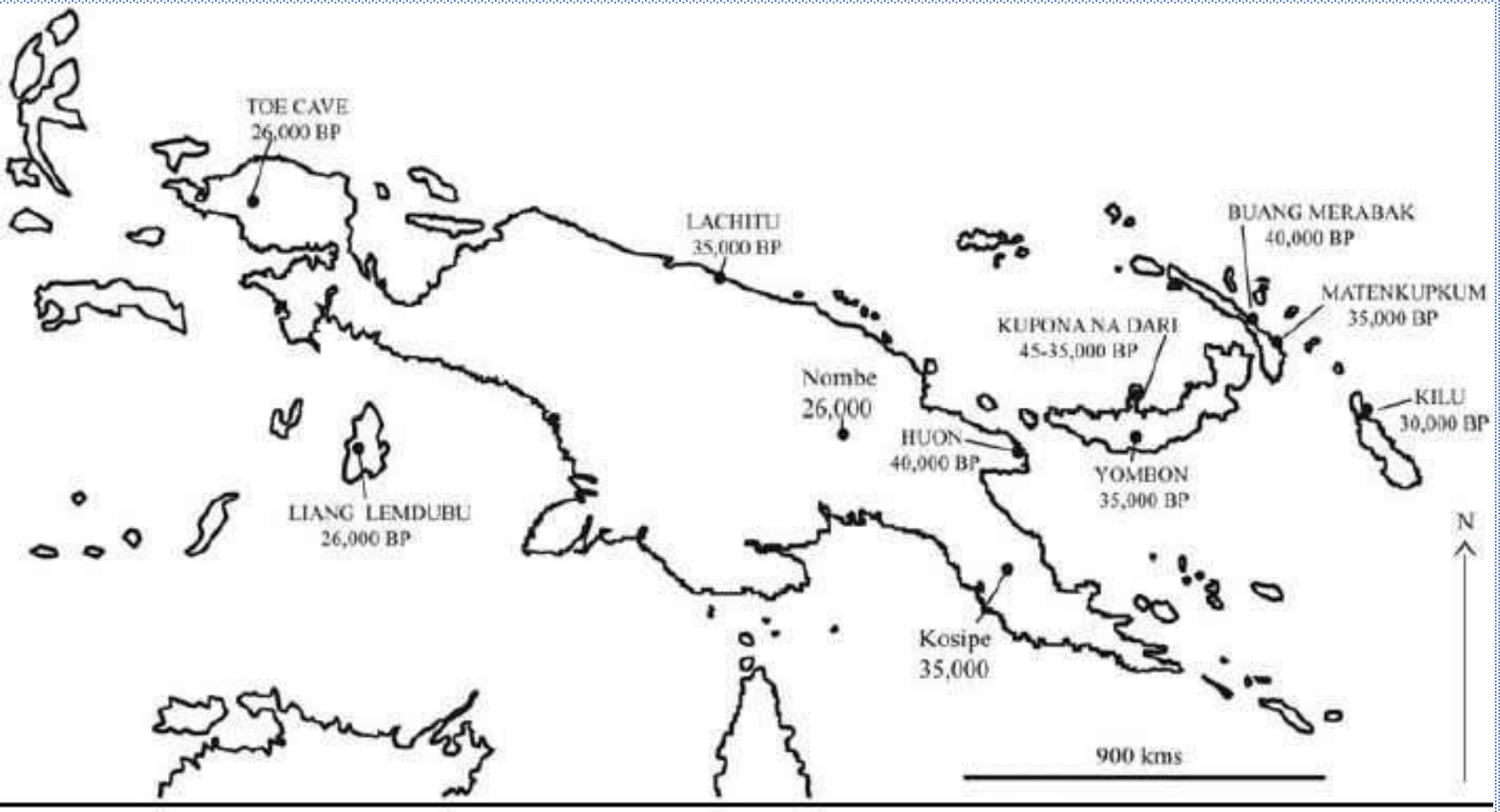
Getting to Australia

Human forms prior to H. sapiens made it to Java, Sulawesi and Flores but no further.

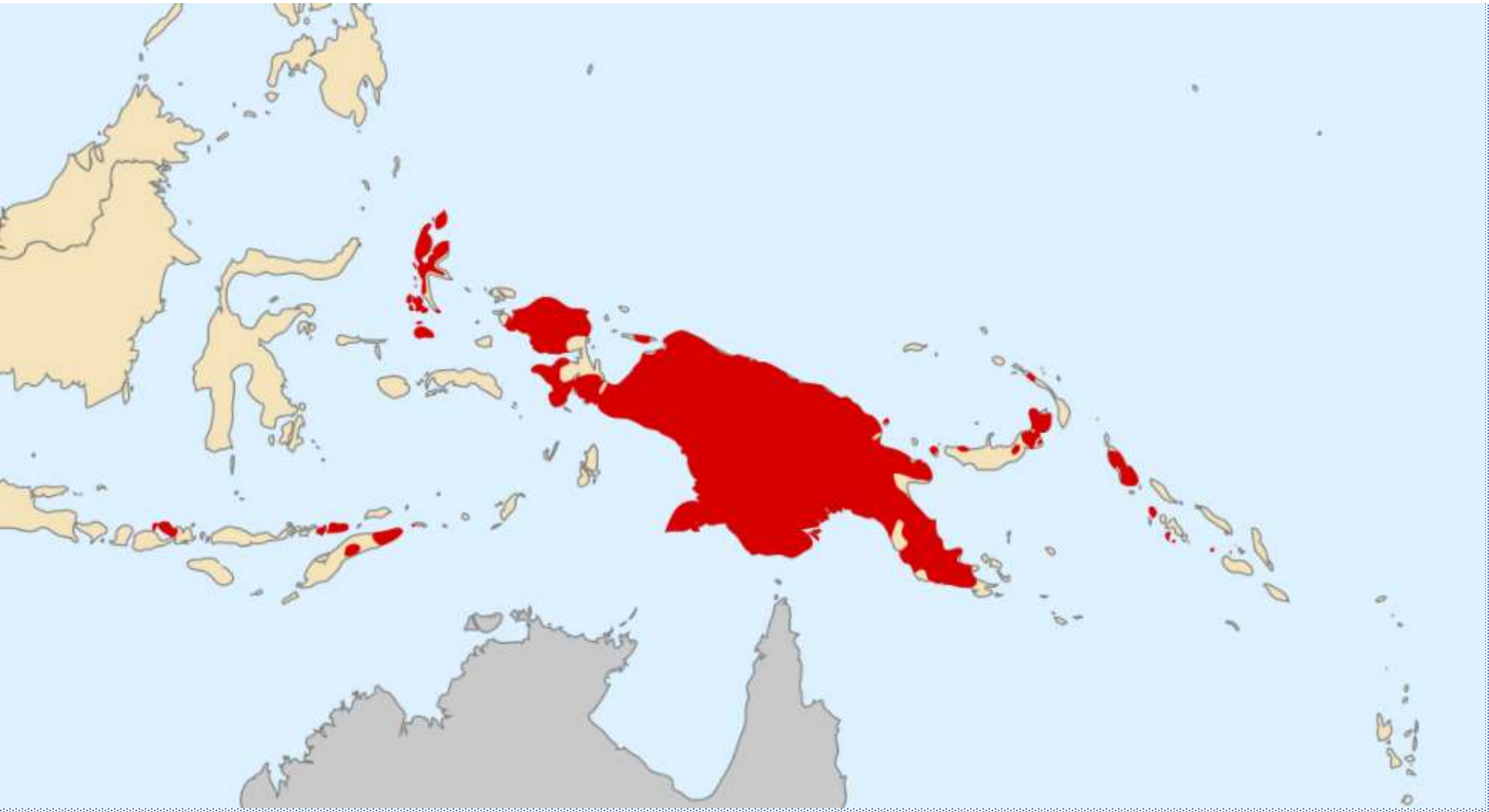
Involved water crossings – but some crossings were intervisible – so the people knew there was somewhere to go, and while they were going could see back.

Four sea level scenarios

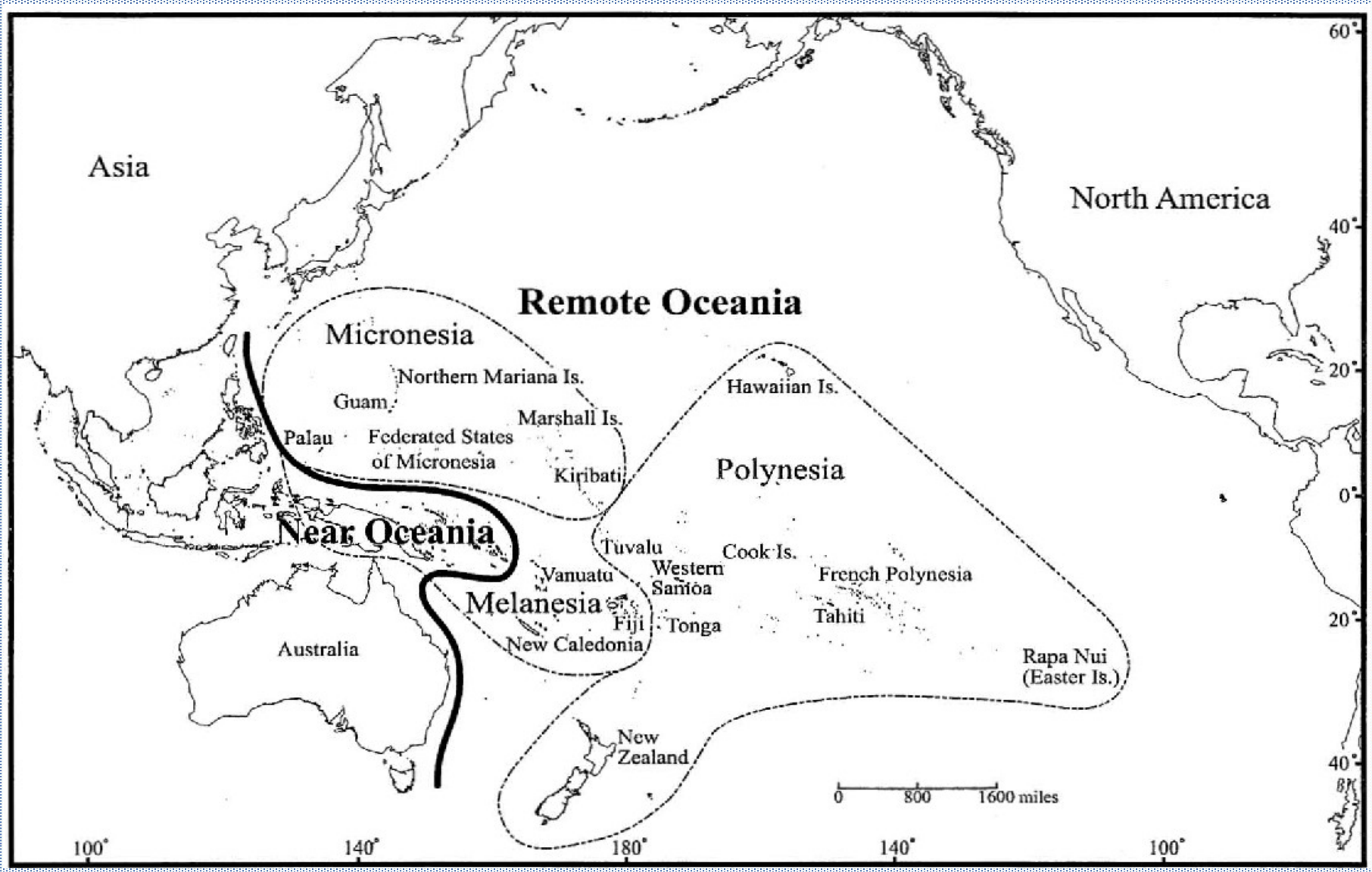
Number of scenarios under which the lands were intervisible



Islands are all intervisible out to the end of the Solomons. More ancient water crossings to get to these. Genetics says there were small populations in this broad area then an expansions after the last glacial maximum ~ 16,000 years ago.



The distribution of the Papuan languages, in red.
Tan is Austronesian and grey the historical range of Australian languages.


Asia
North America
Remote Oceania
Micronesia
Northern Mariana Is.
Guam
Marshall Is.
Palau
Federated States of Micronesia
Kiribati
Hawaiian Is.
Polynesia
Near Oceania
Tuvalu
Cook Is.
Vanuatu
Western Samoa
French Polynesia
Melanesia
Fiji
Tonga
Tahiti
New Caledonia
Australia
Rapa Nui (Easter Is.)
New Zealand
0 800 1600 miles
60°
40°
20°
0°
20°
40°
100°
140°
180°
140°
100°

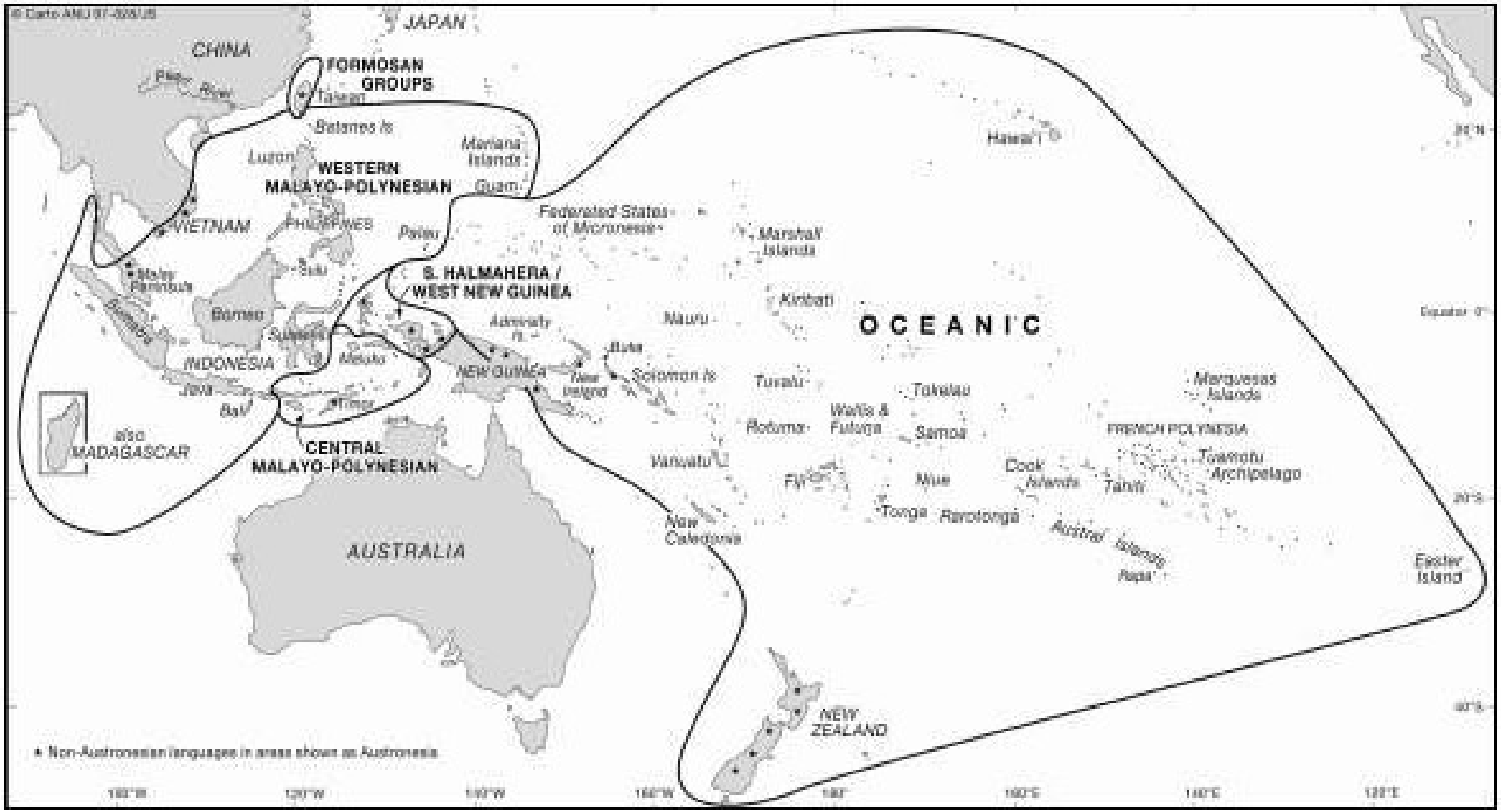
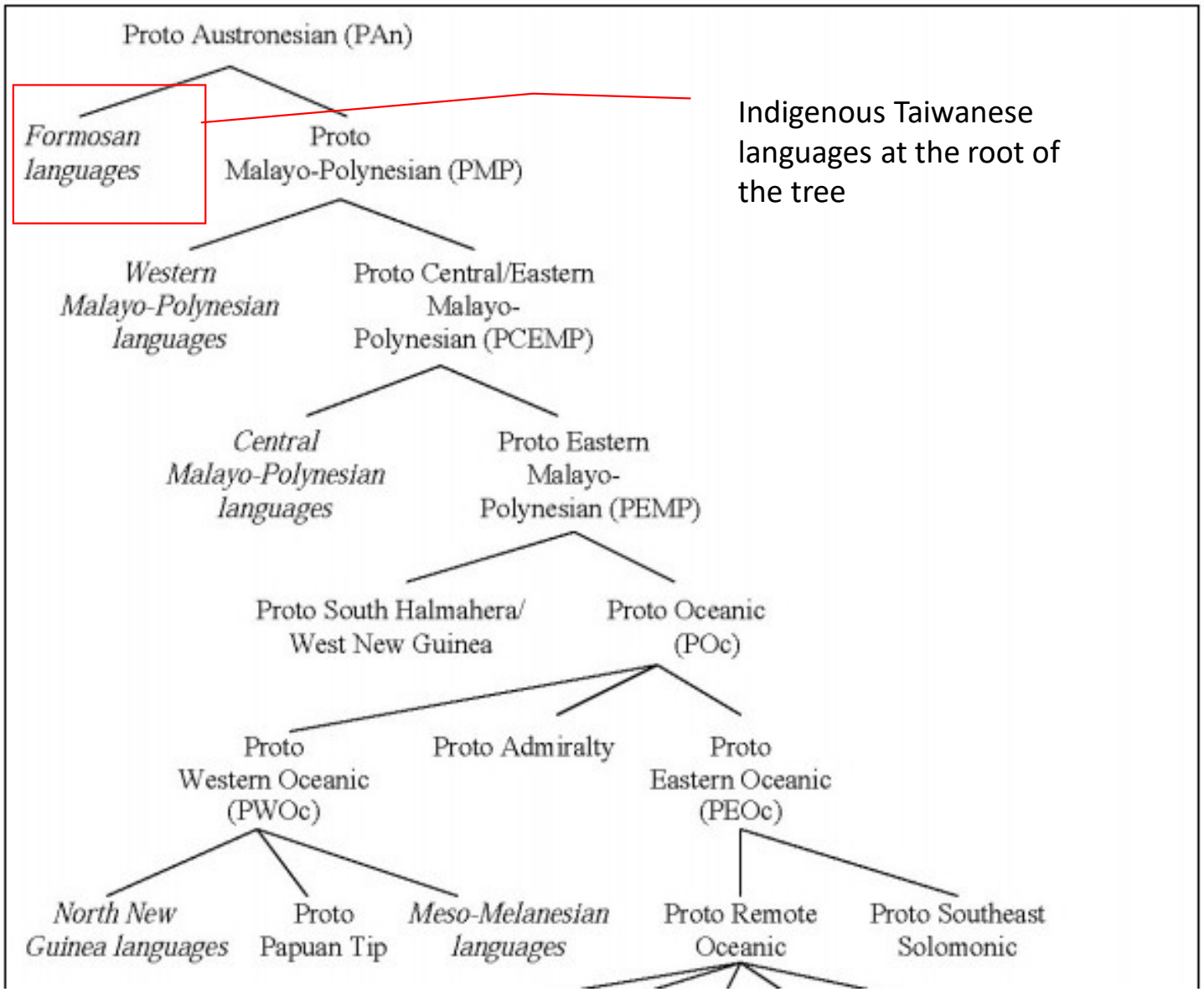


Figure 1: The Austronesian language family and major subgroups

Only Austronesian speakers had the technology to get beyond Near Oceania into Remote Oceania.



Indigenous Taiwanese languages at the root of the tree

Language Family Trees

Can only build trees of surviving languages

If an ancestral language is lost before it comes to record then it vanishes from the tree.

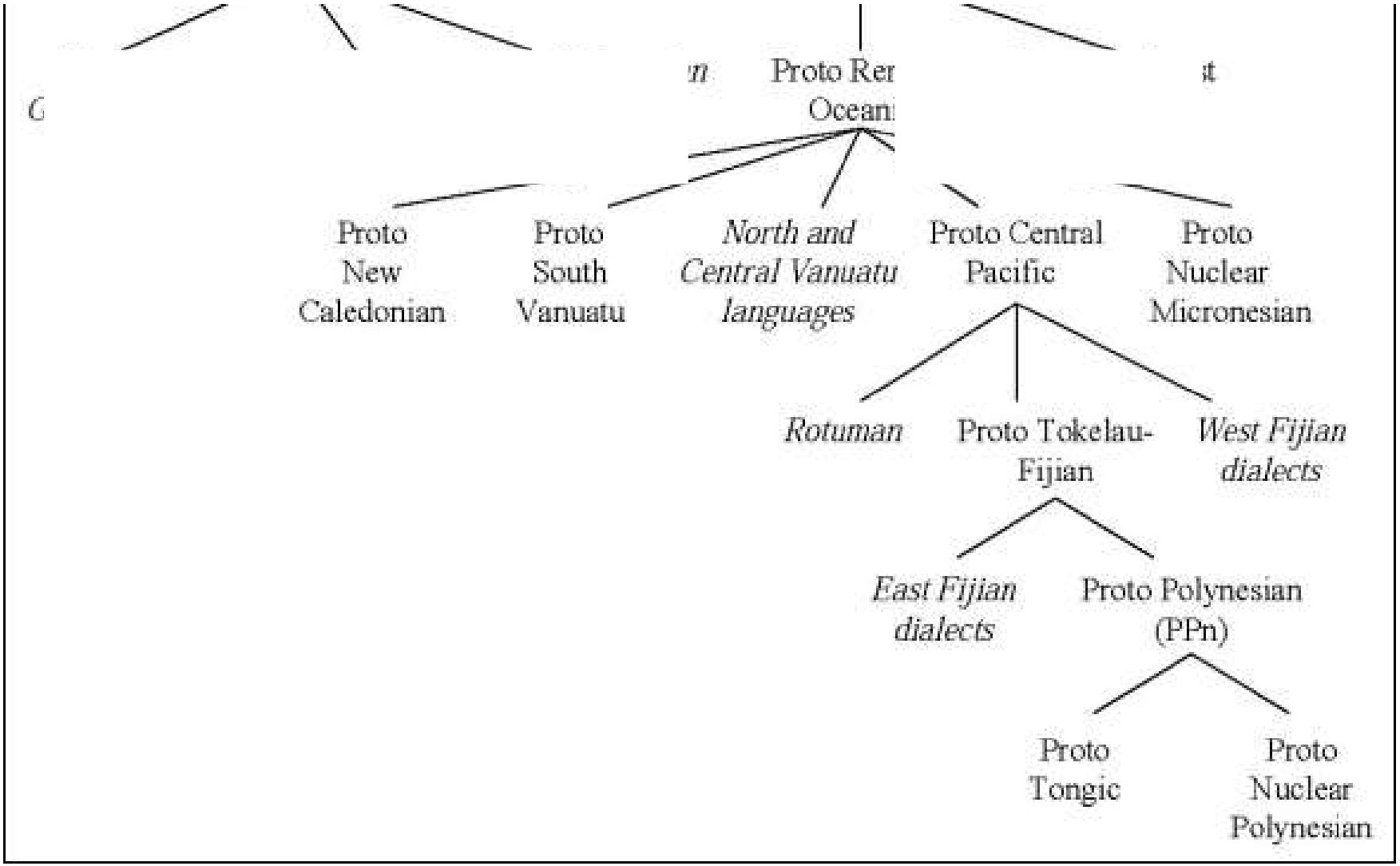


Figure 3: Schematic diagram of the diversification of Austronesian languages

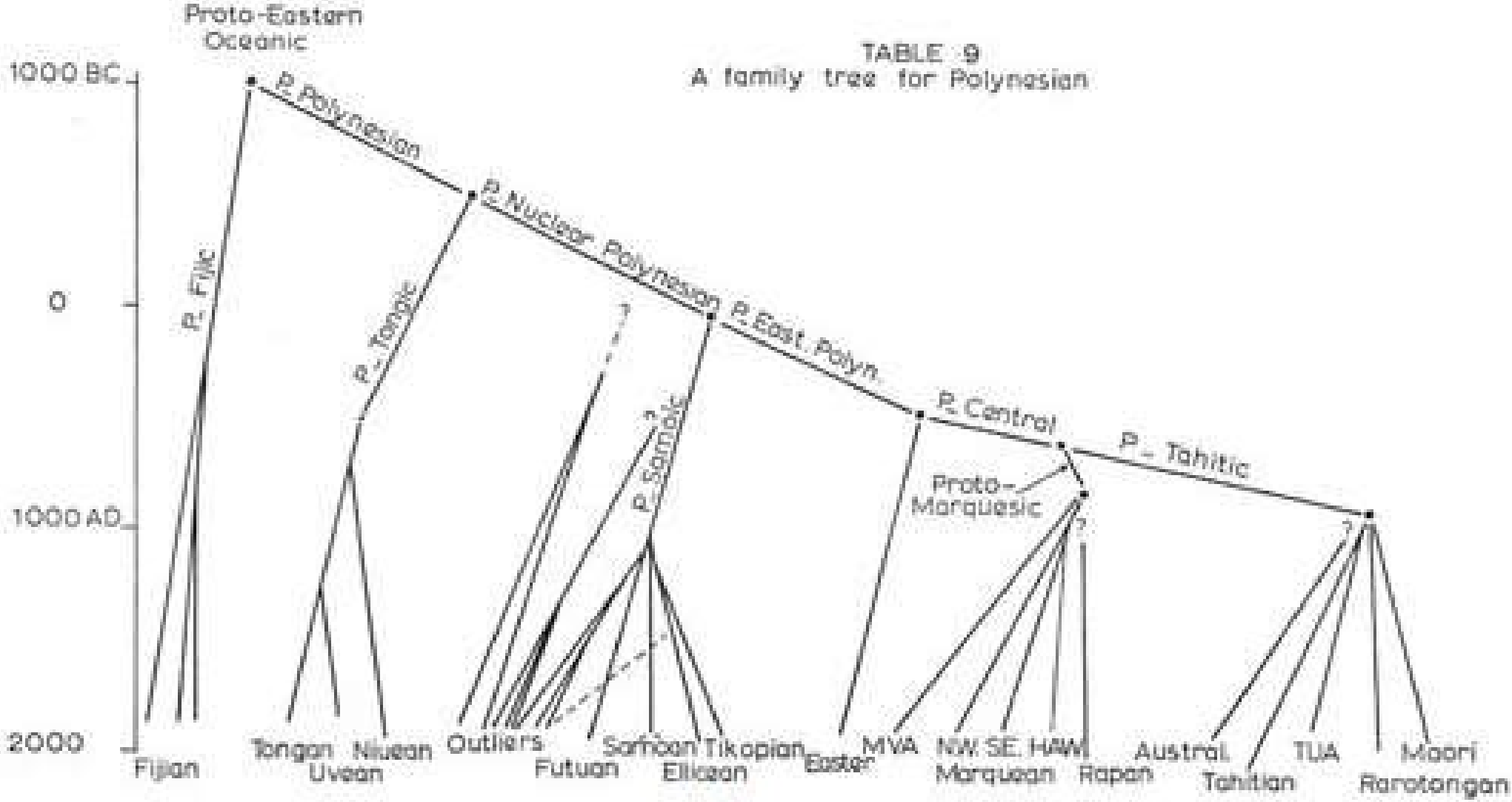


TABLE 9
A family tree for Polynesian
Proto-Eastern Oceanic
1000 BC
0
1000 AD
2000
P. Polynesian
P. Nuclear Polynesian
P. East. Polyn.
P. Central
P. Fijic
P. Tongic
P. Samoic
P. Tahitic
Proto-Marquesic
Fijian
Tongan
Niuean
Uvean
Outliers
Futuan
Samoan
Tikopian
Ellicean
Easter
MVA
NW. SE. Marquesan
HAW
Rapan
Austral.
Tahitian
TUA
Maori
Rarotongan

TABLE 9

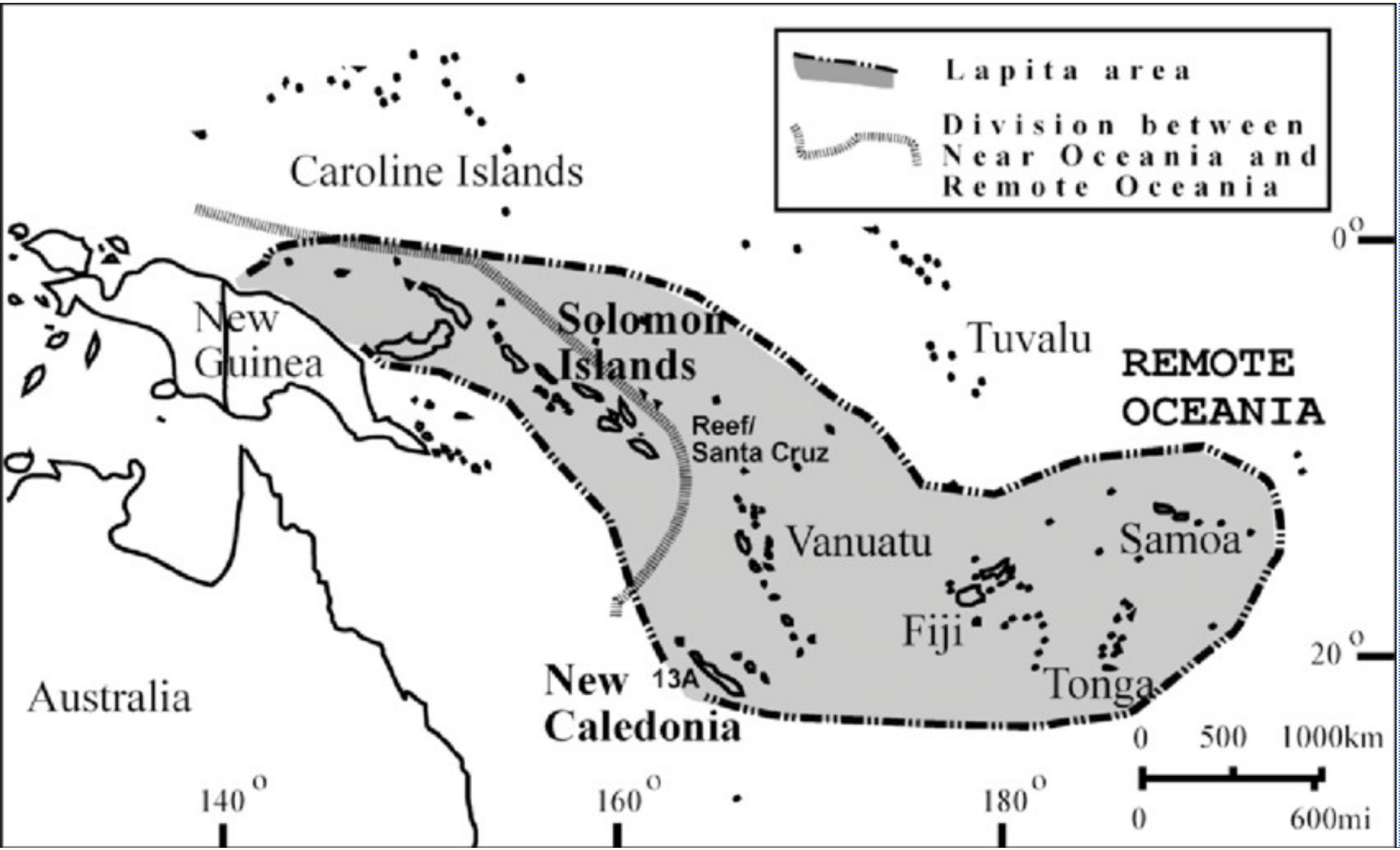
Archaeology

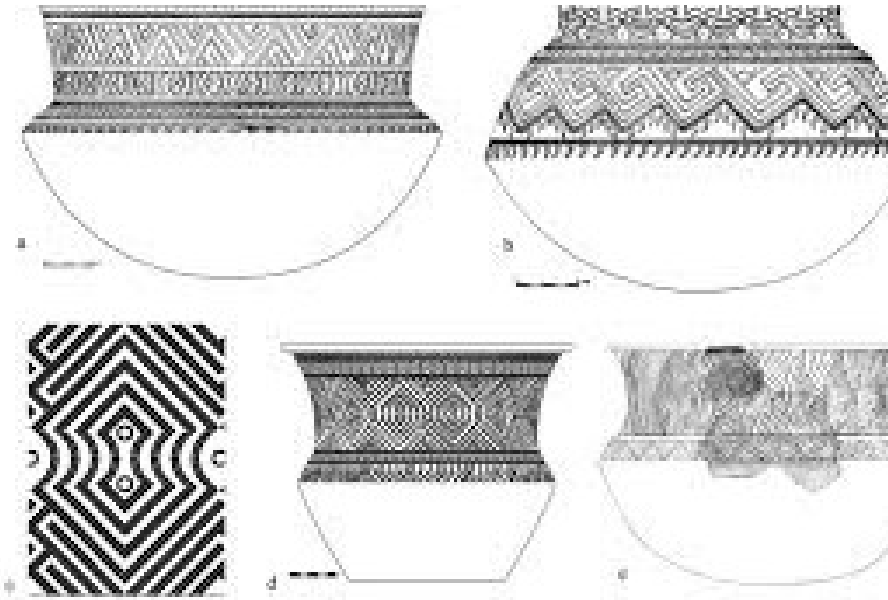
Archaeologically it is clear the first people to get to remote Oceania were people called Lapita People after their distinctive pottery, first recognised in New Caledonia

Sites found range 1600 BC to about 500 BC.

Oldest in the West

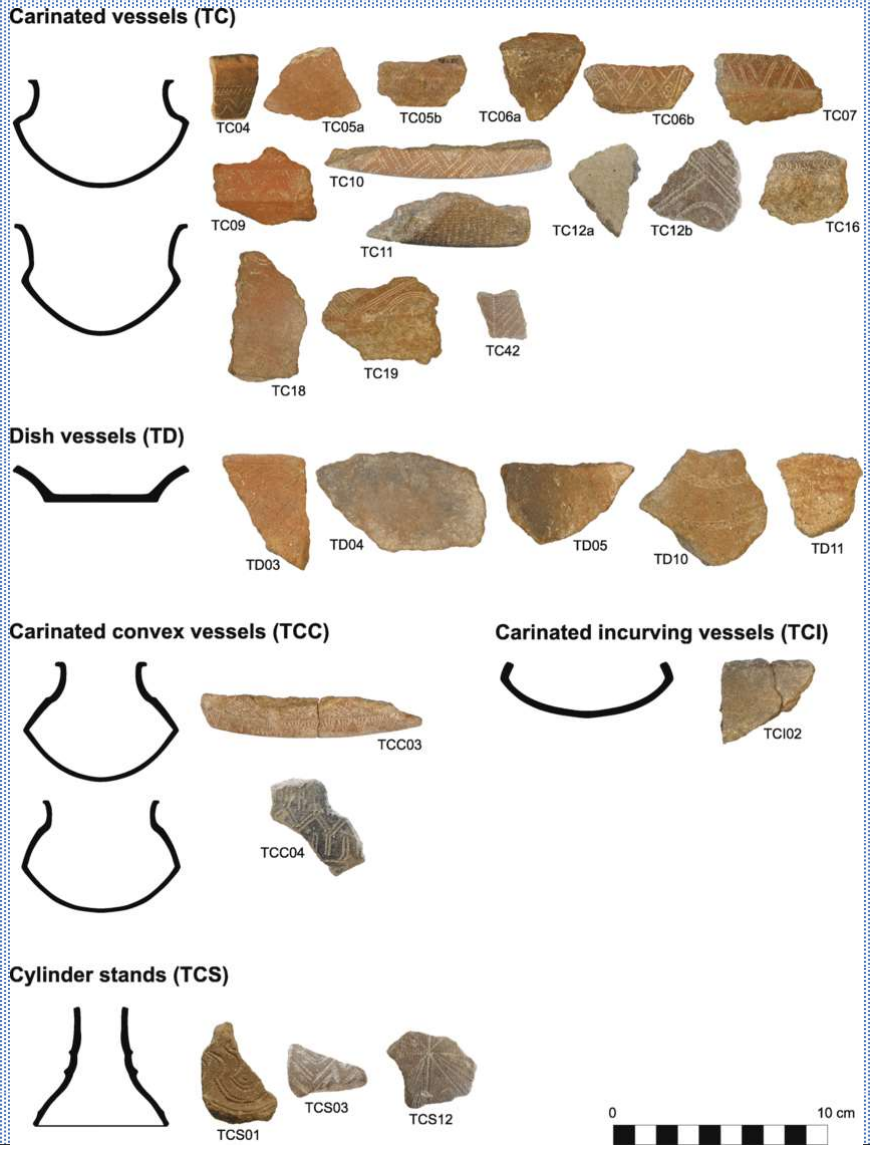
Seen as being the Austronesian language speakers that spread the language into Remote Oceania.


Lapita area
Division between Near Oceania and Remote Oceania
Caroline Islands
New Guinea
Solomon Islands
Reef/ Santa Cruz
Tuvalu
REMOTE OCEANIA
Vanuatu
Samoa
Fiji
Tonga
New Caledonia
13A
Australia
0°
20°
140°
160°
180°
0 500 1000km
0 600mi



Dentate stamped pottery

Some stamping was also lime filled



Origin?
People have looked westward for an origin to the pottery style, but it seems the culture developed in the west of its area - in the Bismarck Archipelago.

Significant Lapita site: Teouma on Éfaté in Vanuatu

Seafood finds from a pristine environment, so an early colonisation site

1000 – 1200 BC

~ 100 individuals buried

Heads removed from all post burial and 8 reinterred, some in Lapita decorated pots

Genetics

The genetics of modern remote oceanic people show signs of being a mixture of Papuan and Asian populations, on whole genomes and on male chromosomes (Y).

Male lines (Y Chromosome – male inherited) e.g. 62% Papuan in modern Polynesians.)

The female descent (mitochondrial – only female inherited) are Asian. e.g. 96% in modern Polynesians.

Whole genome - estimated 79% of the Polynesian autosomal genome is of Asian origin, whereas 21% is Papuan

One suggestion is that the ancestral remote Oceania societies were matrilocal. Men moved to their wives abode.

Question was: did this mixing take place over a short or long period of time and narrow or broad geographic area?

Ancient DNA can resolve this - DNA from the time of the Lapita people.

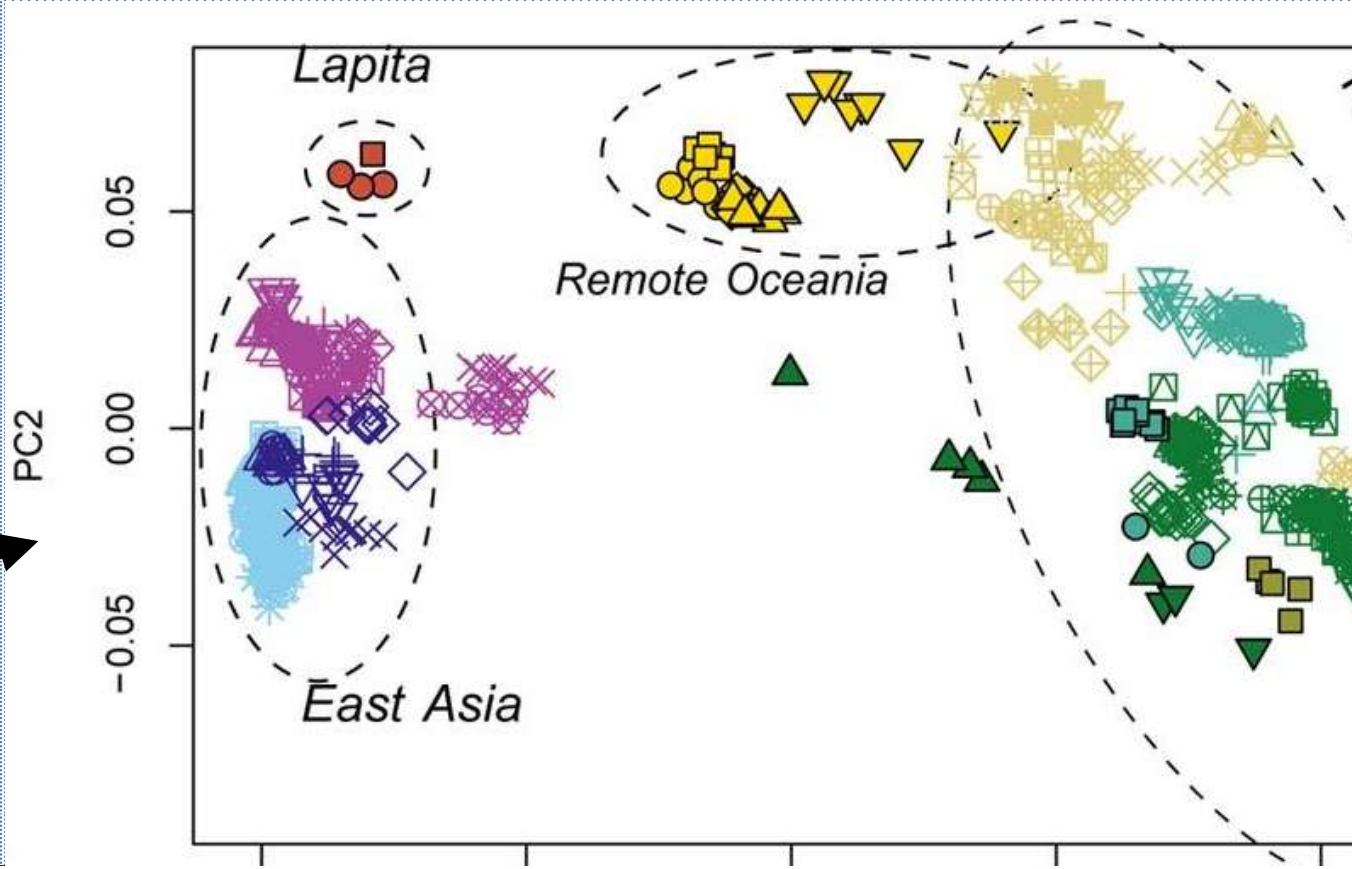
Thanks to Petros bones – the densest in the human body - recovery of ancient DNA is now possible from warm climates.

Genetics

Now have ancient DNA from Lapita sites: Teouma Vanuatu (4 individuals, 3 female) and Tonga (1 individual).

Whole genome sequencing of these individuals are close to Asian populations without Papuan admixture. Separate from modern Polynesians

Two dimensional map of the distance between different genome specimens



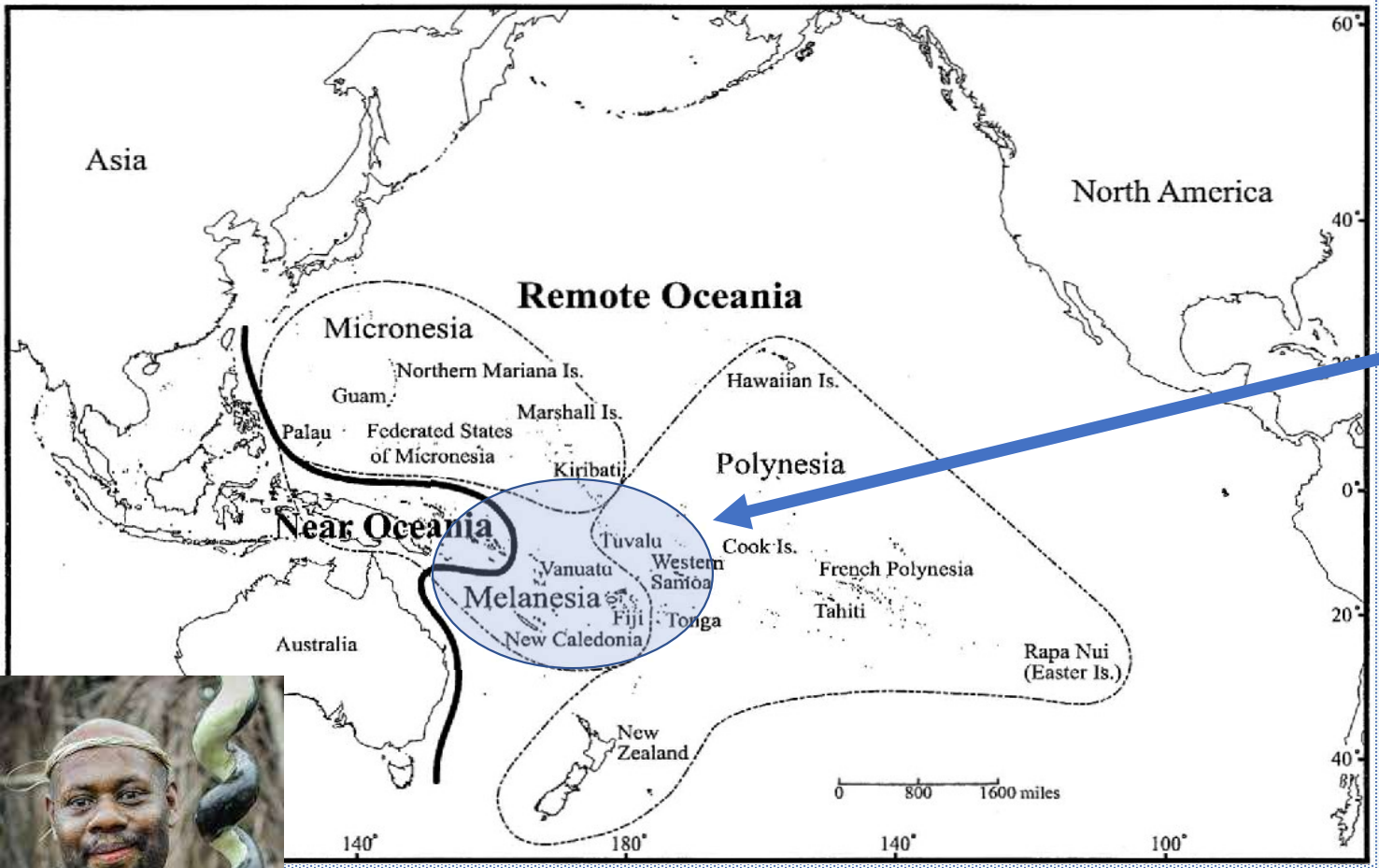
Genetics

Conclusion is that Papuan admixture took place after the time of the Lapita People and after the first residents of Polynesia emerged, hence admixture was a wide time and space effect.

This happened with little apparent disturbance to the inherited Austronesian languages, but if the Papuan people voyaging had earlier adopted an Austronesian language it might not show.

Once thought Lapita people were the sole ancestors of the Polynesians.

Clearly not true – Polynesians are an admixture of Papuan and a later the Asian originated Lapita population.



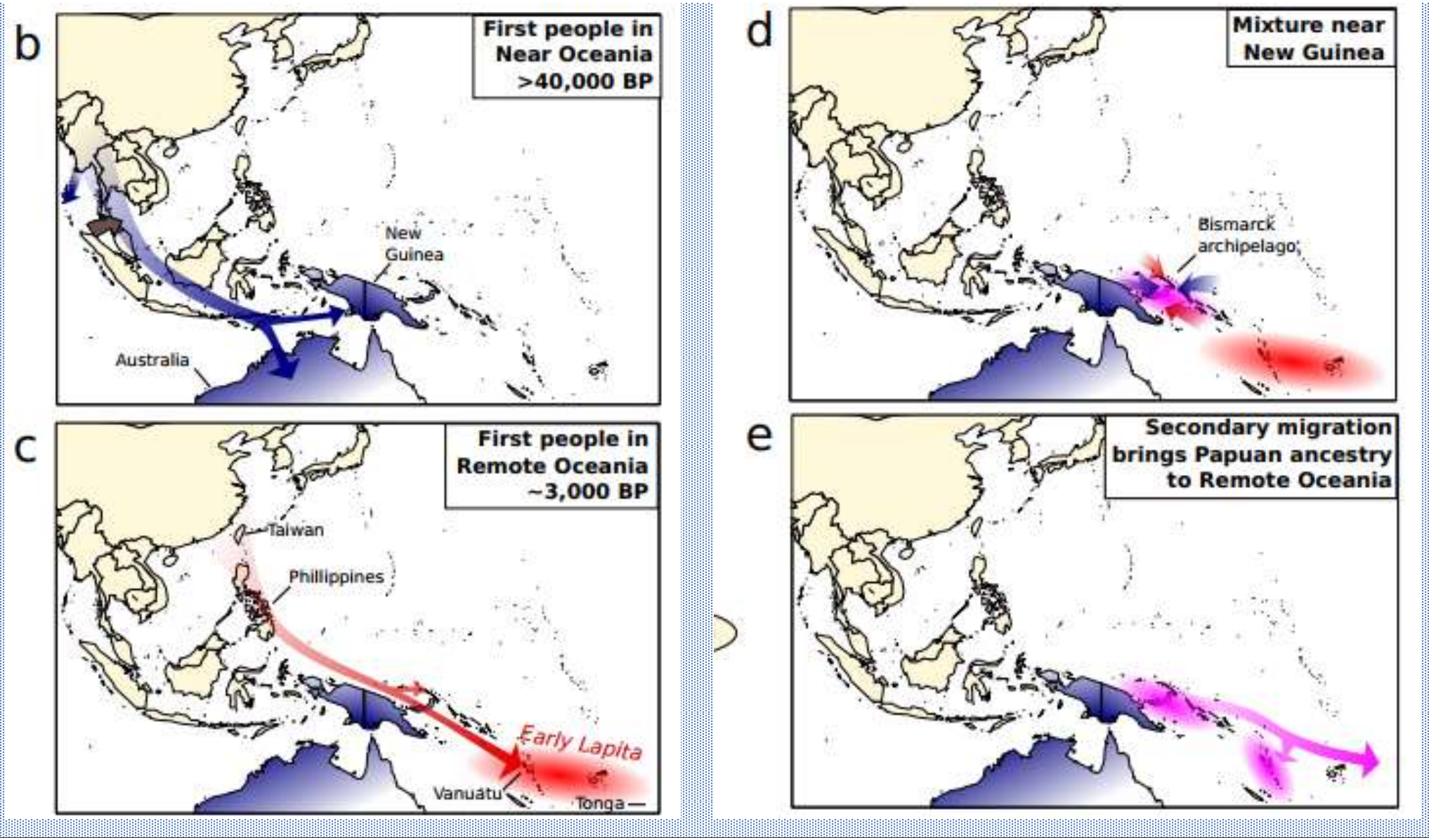
Likely explanation is that in this area C. 1000 BC to 0 AD there was voyaging by males including Papuans or some with Papuan genetic heritage, who left a genetic legacy.

New Britain is the best fit genetically for the source of the 'Papuan'

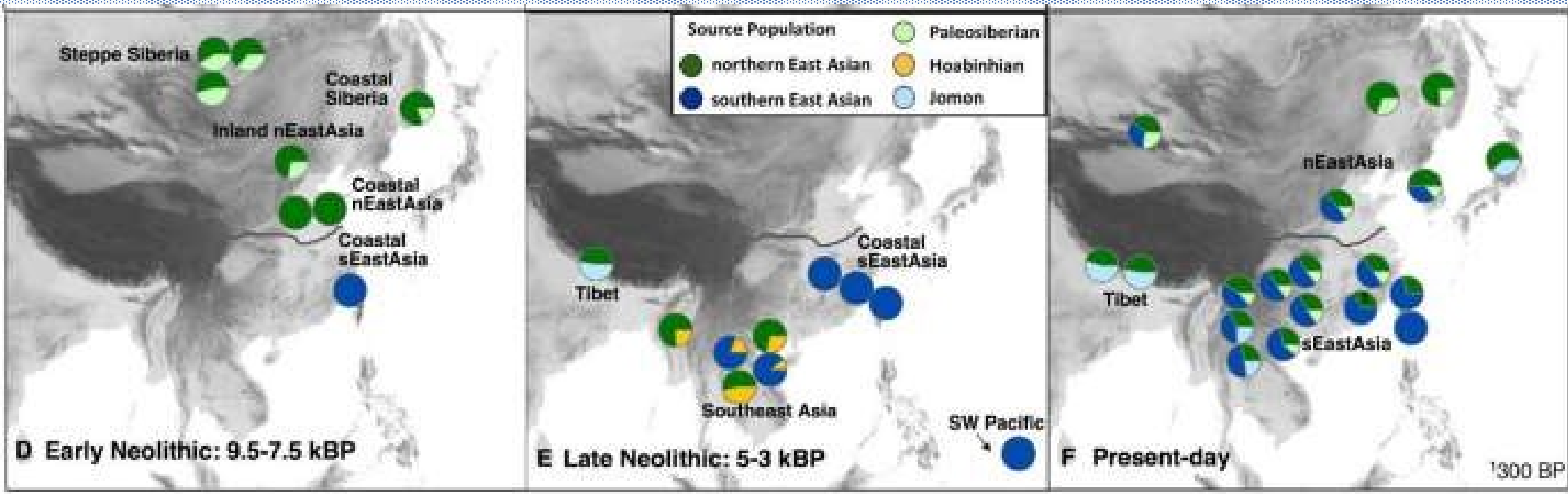
Polynesians who spread to the rest of Polynesia carried that.

Not completely blended genetically. The further east in that area the greater the Asian share.

Some selective advantage from Papuan? Maybe malarial resistance.


b
First people in
Near Oceania
>40,000 BP
New
Guinea
Australia
c
First people in
Remote Oceania
~3,000 BP
Taiwan
Phillippines
Early Lapita
Vanuatu
Tonga
d
Mixture near
New Guinea
Bismarck
archipelago
e
Secondary migration
brings Papuan ancestry
to Remote Oceania

So where were they from in Asia?



Recent Ancient DNA studies from China - whole genome
Early Neolithic distinct populations Coastal East Asia , North and South
Lapita connect to South
The Han Chinese expansion has eliminated any pure South DNA inheritance, other than among the indigenous people on Taiwan
No Austronesian languages on mainland China – only the indigenous people of Taiwan. Han replacement again?
There is (as yet) no archaeological link to Taiwan, only genetics and language.
Contention: The Austronesian homeland is coastal southern East Asia including Taiwan, not exclusively Taiwan.

Polynesians – Where are they from?

Short answer: Coastal China *and* Papua

Slightly longer answer:

- **Language - Austronesian – surviving relatives on Taiwan**
- **Culture – ? coastal Southern China via island SE Asia but a substantial proportion developed in-situ**
- **Physically - coastal Southern China with a Papuan element added *after* the first move into Remote Oceania**