

Major New Scientific Paper On Ancestry of Pacific Islanders

By Matthew Spriggs

A MAJOR NEW PAPER ON THE origins and ancestry of Pacific islanders was published yesterday in the major world scientific journal "Science".

It was a collaboration of a team of geneticists from Harvard University, USA, led by Yue Chen-Liu and David Reich, along with Ron Pinhasi from the University of Vienna in Austria and Pacific archaeologists. Much of the archaeological effort was coordinated by Rosalind Hunter-Anderson, a long-time specialist on the archaeology of Guam and the wider Mariana Islands in Micronesia.

I was among the 40 authors of the study, contributing to the interpretation of the findings in the light of archaeological and linguistic evidence from across the Pacific.

The study analyses ancient DNA, genetic material extracted from the bones and teeth of skeletons excavated by archaeologists in Micronesia and dating to

the last 3000 years or so. These were then compared to other archaeological samples – particularly those from Lapita and later sites in Vanuatu – and modern-day inhabitants of Micronesia and the wider region.

Pacific peoples of course have their own stories of origins, either from far islands or from the land itself. When the first European visitors came to the Pacific, mainly from the eighteenth century onwards, they too speculated about where populations on the far-flung Pacific islands could have come from.

Many theories have been put forward since and disputed. But it is with the development of methods to extract ancient DNA from the actual bones and teeth of long-dead individuals that now gives us the power properly to judge these different theories and come up with definite answers. The problem is that DNA degrades after a body is buried and such degradation is much worse under tropical conditions of high rainfall and heat.

It was only in 2016 that the first ancient DNA covering the entire genetic profile of an individual was published from anywhere in the tropical world, by a team from Harvard led by Pontus Skoglund and David Reich. We should be proud that most of the samples in this first study came from Vanuatu, from the famous Lapita culture site of Teouma on Efate, excavated between 2004 and 2010 by an international archaeological team led by the Vanuatu Kaljoral Senta (VKS) and ANU.

The New Guinea and Solomon Islands region has been settled for about 50,000 years, originally by groups known as 'Papuan'. But in Vanuatu, the pottery-using Lapita culture represented the first human settlers, some 3000 years ago. The earliest recognizable Lapita sites come from the Bismarck Archipelago, from islands such as New Britain, New Ireland and Manus to the immediate east of New Guinea, but its origins

clearly go back into Island Southeast Asia (Indonesia, the Philippines and Taiwan) and beyond that to the early rice farmers in southern China. Lapita sites are also known from Vanuatu, New Caledonia, Fiji, Tonga, Samoa and Wallis and Futuna. In all these places they represent the first human settlers.

From the study of Pacific languages, we know that the Austronesian languages of the Pacific islands can be traced back through Island Southeast Asia to their origins in Taiwan, among the Taiwanese Aborigines who were there before the modern-day Chinese migrated in recent times and who still live in the mountain regions of the island. All traditional languages in Vanuatu are part of this Austronesian language family.

That first 2016 ancient DNA study by Skoglund and colleagues in the journal "Nature" was followed by two further important papers highlighting the ancient DNA of Vanuatu in 2018. One of them was again by the

Harvard team, this time with Mark Lipson as senior author, and the other by a team from the Max Planck Institute in Germany, led by Cosimo Posth and Johannes Krause.

VKS archaeologists were involved in all these studies, and in the most recent aDNA study of Vanuatu published in 2020 again by a team led by Mark Lipson and David Reich at Harvard.

This last study examined the DNA of burials from the grave of Chief Roi Mata on Eretok or Hat Island in north Efate, whereas the previous two looked at a range of ancient samples from different islands and time periods in Vanuatu.

The combined evidence of these four studies show that the first human settlers of Vanuatu were East Asians, whose closest living relatives today are the Taiwanese Aborigines and the Kankanaey tribe of the northern Philippines. We call them 'First Remote Oceanians' or 'FRO-Southwest Pacific'.

Within a few hundred years, perhaps at the end

of the Lapita period when the population of Vanuatu was still very small, they were joined by Papuan settlers (mostly men) from the island of New Britain – their closest living relatives would be the Baining of the mountains inland of Rabaul in East New Britain. Most Ni-Vanuatu today are the descendants of the mixing of these two groups – East Asian and Papuan.

So are other Pacific people such as Kanaks, Fijians and Polynesians. The only difference is in the proportion of ancestry derived from each group. Ni-Vanuatu today are about 80-90% Papuan-New Britain ancestry and 10-20% FRO-Southwest Pacific, whereas Polynesians are about 25% Papuan-New Britain and 75% FRO-Southwest Pacific. Fijians are somewhere in between in ancestry proportions. As the Papuans moved further out into the Pacific there were fewer of them and so they had less genetic influence.

Major New Scientific Paper On Ancestry of Pacific Islanders

□ From Page 9

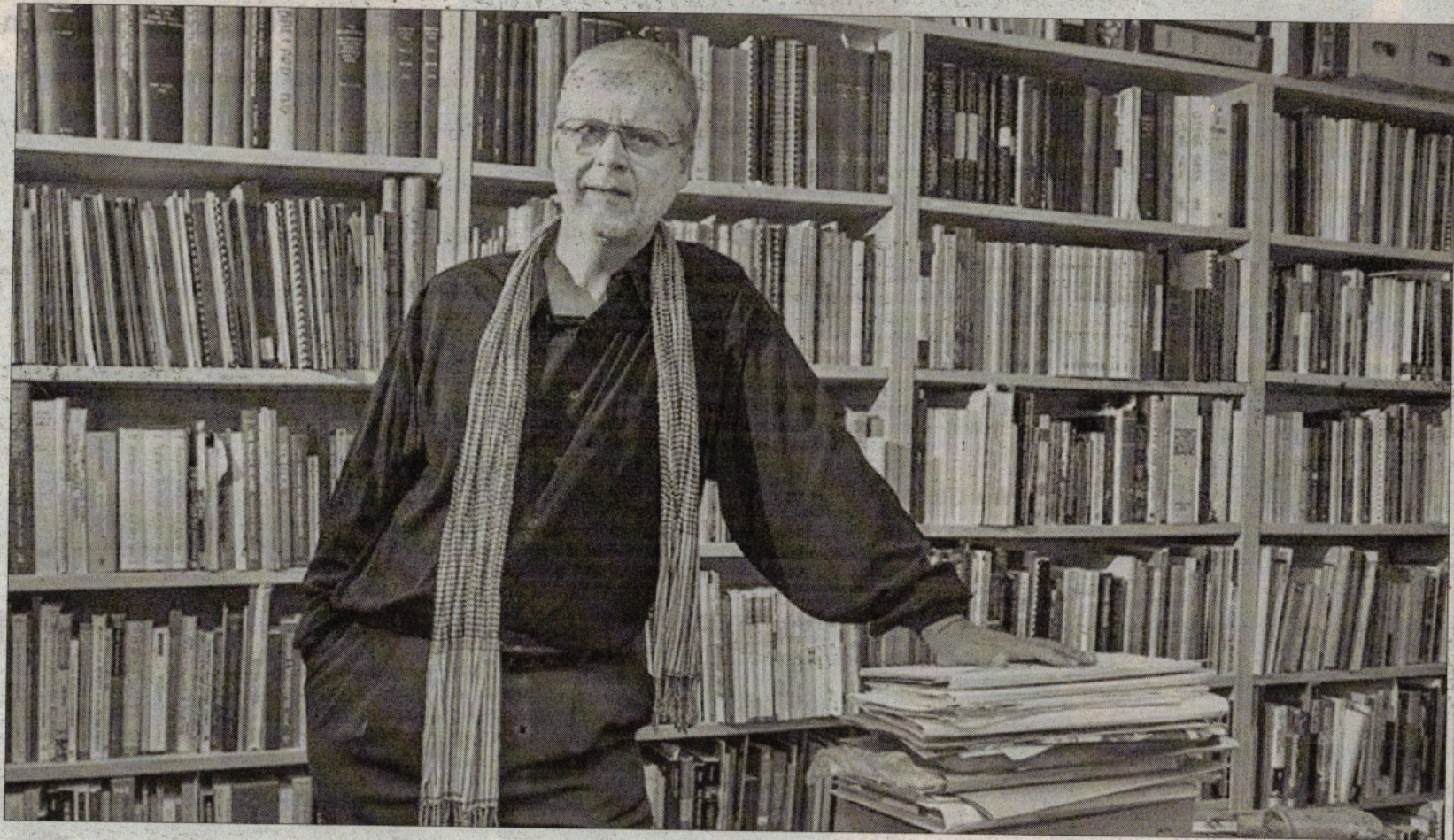
Then within the last thousand years Polynesian settlers from two different source islands migrated and settled Futuna, Aniwa, Ifira, Mele and part of Emae, also intermarrying more widely in TAFEA and SHEFA provinces where some Polynesian ancestry is common.

For instance, several people buried with Chief Roi Mata in the 1600s showed some Polynesian ancestry.

The new paper by Yue Chen-Liu and others is the latest one to look at the origins of Pacific peoples, this time concentrating on the vast area of Micronesia in the northern Pacific.

It is titled "Ancient DNA reveals five streams of migration into Micronesia and matrilocality in early Pacific seafarers".

The paper helps expand the results of earlier studies, also showing once again that



Professor Matthew Spriggs. Photo: ANU

are more complicated than most theories have suggested.

The Harvard team used 164 ancient DNA samples from cemeteries at five sites on Guam and Saipan in the Marianas and from Pohnpei in Central Micronesia that ranged in age from 2800 to 300 years ago.

This increased the number of ancient DNA samples studied from the Pacific by five times! They also sampled 112 living people mainly from Guam, Palau, Pohnpei and Chuuk in Micronesia and compared the results with many more ancient and modern samples from the region.

The five streams of migration they identified were labelled as M1 to M5. First there were separate migrations of East Asians to the Mariana Islands and Palau from somewhere in Island Southeast Asia, either the present-day Philippines or Eastern Indonesia around 3000 years ago.

They were near relations to those 'First Remote Oceanians' who settled Vanuatu but different enough that we can tell them apart. The geneticists have labelled them 'FRO-Marianas' (M1) and 'FRO-Palau' (M2).

Sometime between about 2400 and 1700 years ago some of the M2 group moved on from Palau to the Marianas and mixed with the M1 group there.

The CHamoru of Guam and the Chamorro of the rest of the Marianas are the

descendants of these two groups and are the only Pacific Island population that just prior to European contact showed no Papuan admixture at all. They share about 85% ancestry from M1 and 15% from M2.

The third migration (M3) was again by an East Asian group, FRO-Southwest Pacific, already known to us from the early Vanuatu Lapita people.

They moved from somewhere in the Lapita culture area into Central Micronesia, presumably before about 2500 years ago although that is not certain.

The next migration (M4), which affected the whole of Micronesia except the Marianas, was of a Papuan group. But not the same as the New Britain ones whose genes are found all over the Southwest Pacific.

These Papuans came from further north along the northern fringes of New Guinea, most likely from the area around Manus Province, and are labelled as 'Papuan-New Guinea'.

The admixture between M3 and M4 in Central Micronesia probably took place around 2100 to 1800 years ago, but in Palau the mixture between M2 and M4 is dated by the geneticists to 2500 to 2200 years ago. Today Central Micronesians derive about 27% of their ancestry from 'Papuan-New Guinea' whereas for Palauans the percentage is higher at

38%.

The final documented migration into Micronesia was of Polynesian people, within the last 1000 years, and two of the Micronesian islands, Kapingamarangi and Nukuoro are Polynesian-speaking today.

This was part of the same movement of Polynesians that led to Vanuatu having some small islands with Polynesian languages today. Clearly something was happening in Polynesia at that time to make people want to leave!

If we compare the genetic information to what we know from linguistics and archaeology it is very interesting.

Palauan and CHamoru/Chamorro are both Malayo-Polynesian languages deriving separately from Island Southeast Asia, which fits with M1 and M2.

The early archaeology in these two archipelagos is somewhat different too.

Central Micronesian languages mainly belong to a larger grouping called Nuclear Micronesian, derived from somewhere in the Oceanic Austronesian sub-group area between Manus and North-Central Vanuatu, which would fit M3. The linguist Bob Blust argued strongly for an origin linguistically in the Malaita or Makira area in the Southeast Solomons.

Archaeologically the Southeast Solomons is very poorly researched so we don't know if there are Lapita

culture sites there which could fit with this origin.

Central Micronesia's early archaeology is also unknown. There are no sites yet found older than 2100 years ago and we may be missing several hundred years of earlier settlement.

This also means that we don't yet have archaeological evidence of when exactly M4 took place in Central Micronesia or Palau and what the effect of this migration of culturally quite different people (mainly men) would have had on island cultures. One thing seems clear and that is that it didn't change the languages either of Palau or of Central Micronesia.

This is very similar to what seems to have happened in Vanuatu where incoming Papuan-New Britain populations, again mainly men, didn't have enough effect on local languages to have caused major changes.

There must be something in the idea of 'mother-tongue' after all, with children learning their mother's rather than their father's language if they were different.

The genetic information also tells us something about marriage patterns in the early Pacific. It shows a pattern of matrilocality, which basically means that men join their wife's community on marriage, as opposed to patrilocality where a woman moves to her husband's village upon marriage.

In early farming societies of Europe several thousand

years ago the ancient DNA results show that it was generally the women who moved, whereas for early settlers in both Micronesia and in the Southwest Pacific, including Vanuatu, it was the man who generally moved to live with their wife's family.

The clue is in the pattern of mitochondrial DNA which is inherited solely from one's mother.

When we compare different related communities in the past, such as Guam in the Mariana Islands and Vanuatu, it was found that although the rest of their DNA was shared, the mitochondrial DNA was quite different which can only happen if men from outside the group are marrying in.

"Females certainly moved to new islands, but when they did so they were part of joint movements of both females and males" explains Harvard's David Reich.

"This pattern of leaving the community must have been nearly unique to males in order to explain why genetic differentiation is so much higher in mitochondrial DNA than in the rest of the genome."

This wasn't just true of the first generation of migrant men arriving in these archipelagos but persisted in many areas over time. In some areas today, the pattern is that women move to their husband's village, the patrilocality pattern.

What this shows is that culture and 'kastom' are forever changing to fit new

circumstances.

There is still much to learn. We still don't have very early ancient DNA samples from Central Micronesia or Palau, for instance, and the archaeology is still poorly known in many island groups there, as well as in the Southeast Solomons.

The Papuan movements out from New Britain and from northern New Guinea that affected the whole of the Southwest Pacific and Micronesia (except the Marianas) took place at about the same time.

What caused this need to migrate around 2500 to 2000 years ago? At present we can only guess.

One thing is very clear - When we talk of 'Melanesians', 'Micronesians' or 'Polynesians', with the partial exception of Polynesians we are talking of very internally diverse groups.

None of them represent any kind of idealized or pure 'race'; all of them show multiple and sometimes quite different origins. We should only use these outdated terms to refer only to geographical areas - Melanesia, Micronesia and Polynesia. They tell us very little about history.

This article is authored by Emeritus Professor Matthew Spriggs, Vanuatu Kaljoral Senta and ANU, Canberra, with additional information from Juan Siliezar from Harvard University, exclusively for the Vanuatu Daily Post.