

THE UPPER SEPIK-CENTRAL NEW GUINEA PROJECT

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When I was in my middle years of primary school soon after WW2 had ended, I had a 1930s Boys Book of General Knowledge. This included a section on astronomy, so I learnt that the earth went round the sun and not vice versa as it appeared to do, and a section on geology and palaeontology, so I learnt that the earth has an existence going back hundreds of millions of years and that all the creatures on earth, including humans, have evolved over a very long period of time, according to processes described by a man named Charles Darwin (and, of course, Alfred Russel Wallace as I discovered decades later).

In 1962, I was at Telefomin in central New Guinea, not far from the present Ok Tedi mine, as a school teacher. As I had graduated in anthropology at the University of Sydney, I became interested in the material culture of the people there. In 1964, I made a comprehensive collection for the Australian Museum in Sydney.

In 1967 I did a broad-ranging inventory of carved and painted house boards and war shields throughout the Central New Guinea area which became the raw data for a Masters thesis I completed in 1969.

Meanwhile, in 1968 and 1969, I extended my surveys and collections of material culture to the north, into the upper Sepik and Border Mountains region. The collections went to museums in Berlin, Leiden, Sydney and Port Moresby.

A year among the Abau of the Upper Sepik in 1972-73 enabled me to make more comprehensive observations and the collections went to the museum in Port Moresby.

I became increasingly interested in the similarities and differences I could discern in the objects collected throughout the central New Guinea and upper Sepik regions.

At the back of my mind was the notion that if, following the methods of Darwin and Wallace, comprehensive collections of any entity are made and the locations of the origin of those entities are accurately mapped, all sorts of analyses could be carried out to attempt an understanding of diversity and, with some luck perhaps, the evolution of that diversity.

At the time, I had no clear idea about how this might be done or about the tools available for doing it. To add to the data that might be used, I did thousands of rubbings of designs carved on the palm-wood and hardwood heads of arrows used for hunting and warfare, and on the foreshafts of bamboo bladed arrows.

I wrote a paper using a simple system of structural analysis of the designs to see whether various language groups favoured particular design structures. I was never a statistician or mathematician and I used simple percentage counts. But it did show up some apparent preferences for particular design structures from group to group.

During the late 1960s and 1970s, a number of anthropologists came to the central New Guinea and upper Sepik regions to do intensive field research. Those from Europe and the United States generally had been taught to make collections of material culture as part of their research methodology.

Very few ever wrote about those collections, but most of them donated part to the Papua New Guinea Museum in Port Moresby and took the other part back to institutions in their home countries.

So I became aware that the dataset of the material culture of central New Guinea and the upper Sepik extended far beyond the objects I myself had collected — over 500 in central New Guinea and over 3000 in the upper Sepik region.

Through my network of co-researchers, I was able to identify a further 3500 objects from central New Guinea and another 4000 objects from the upper Sepik region.

This gave a total of 11,000 objects from the two regions in museums and private collections world-wide. This would be a significant dataset for rigorous analysis of similarities and differences in material culture for this part of New Guinea.

In the late 1980s, researchers based at the Field Museum in Chicago used a dataset of 6000 objects, collected at precise locations along the north coast of New Guinea before WW1, to investigate whether differences in material culture reflected differences in language or simply geographic distance.

The north coast of New Guinea was the scene of an active maritime trading network that distributed things widely along the coast in a linear fashion. Also introduced into the linear coastal trading networks

were objects that coastal peoples obtained by trade from inland peoples.

On the face of it, one might expect a weak effect for language and a strong effect for distance, particularly as the things in the dataset were categorised for analysis into broad functional classes such as arrows, spears, string net bags, and so on, and recorded as simply present or absent in particular locations.

There is considerable linguistic diversity in that region but an active trade system could be expected to move objects far from their place of manufacture and obscure the effect of linguistic diversity on material culture.

The statistical analysis carried out by the Chicago team indeed suggested that geographical distance, not language, was the significant factor in differences in material culture; ie. that specific characteristics of material culture are not tied to specific ethno-linguistic groups.

Critics suggested that the Chicago team's categories of objects were too general, that the presence-absence dataset was too crude and that the statistical procedures were not sufficiently sophisticated.

I saw an opportunity to test the Chicago team's results by recording the dataset of 11,000 central New Guinea and upper Sepik objects in museums and private collections around the world.

Using a more sophisticated taxonomy of material culture akin to the taxonomies of the natural sciences, ensuring reliable locations of collection and manufacture, and using statistical procedures such as Correspondence Analysis, Analysis of Variance and Mantel tests, I believed we could come up with more reliable results than those of the Chicago team.

What we wanted to know was whether similarities and differences in material culture are brought about by population movements or by other mechanisms such as subsistence systems, inter-marriage, trade and warfare; and whether there are evolutionary processes for material culture that would make possible a reconstruction of proto-cultures from synchronic data — a tall order, as this would be akin to developing a theory of the evolution of biological species without the benefit of palaeontology.

Professor Graeme Hugo, Director of the National Centre for Social Applications of Geographical Information Systems at the University of Adelaide took the Upper Sepik-Central New Guinea Project under his wing. Cash and in-kind contributions from the South Australian Museum and Ok Tedi Mining Ltd leveraged funds from the Australian Research Council Linkage grant scheme for two three-year projects with a total budget of \$400,000 running from 2004 through to 2010.

Andrew Pawley, Professor of Linguistics at ANU and Dr Bryant Allen, whose ANU team has mapped subsistence systems throughout Papua New Guinea, came on board as Partner Investigators.

We had a University of Adelaide PhD student, Andrew Fyfe, join us to do the legwork recording over 11,000 objects in museums and private collections in Australia, Papua New Guinea, Europe, Britain and the United States.

He developed a taxonomy of material culture, obtaining invaluable assistance with the technology of arrow bindings and string net bag construction from handcraft expert Jill Bolton.

Andrew got on top of the statistical procedures by reading how biologists do their analyses, buying the relevant software and playing around with it until he understood it.

He submitted his PhD in 2008, subsequently publishing two papers on analysis of the technical characteristics of arrows and string net bags in the journal *Oceania*. A paper is also available on the USCNGP website.

www.uscngp.com

So far, the results are consistent with the outcome of the Chicago team's analyses — that is, that distance has a stronger effect than language for diversity in material culture. However, we found this to be more so for the arrows, made by men, than for the string bags, made by women, who tend to stay closer to home than do the men.

A Glenunga International High School student, Sai Perchard, created our website in early 2005 as a school-required community project and subsequently developed its functionality through his business, Saitech Web Solutions, while he was a Law and Commerce undergraduate at the University of Adelaide.

Website content management was initially through WordPress but we are now using Ruby on Rails-based Refinery CMS. Reports and papers are hosted on Scribd, and automatically converted to a web-viewable format from Word documents. Images accessible under 'Photographs' are stored on Flickr. Threaded discussion is facilitated using Disqus, allowing users to comment on reports, papers, and other parts of the site.

The USCNGP dataset is an Excel table with hyperlinked images of the objects and long-lat co-ordinates recorded for all locations.

We could not rely on Google Earth for named locations. I identified all the relevant settlements using my own field notes, information from colleagues and the Series T601 1:100,000 maps, published by the Royal Australian Survey Corps in 1979, to calculate latitude and longitude.

The web application uses a Ruby on Rails back-end to provide a JSON data source. The Javascript library ExtJS was used to develop the user interface. The Google Maps version 3 Javascript API provides mapping functionality and PostgreSQL was used as the database management system.

PostGIS was used to spatially enable the PostgreSQL server, allowing the coordinates of each artefact to be stored as geographic objects for the calculation of distances and areas.

This provides the visitor to the website with a Google Earth satellite terrain image showing language polygons and collection sites that can be click-activated to provide lists of objects, with summary data and an image for each object.

Objects in the dataset may also be sorted according to object description, such as bamboo-bladed arrow, shield, stone adze, and so forth, facilitating particular avenues of research by the visitor.

The money for the project ran out at the end of 2010. Andrew Fyfe had to find employment and is now in Canberra crunching numbers for the Department of Education, Employment and Workplace Relations.

I have other projects as Curator at the South Australian Museum and am anticipating an opportunity to complete the upload of another 7500 objects to the dataset on the website; some 2500 are presently available.

We are also coding a sample of several hundred arrow foreshaft designs for design structure and motif to see whether the results of analysis of this kind of data is consistent with the results from analysis of technical characteristics of arrows and string bags.

Two Papua New Guineans from the upper Sepik area, Isaac Suafia currently employed in Port Moresby and Erick Kowa employed in Singapore, discovered the website and contacted me to express their appreciation of the information available on the site.

Isaac Suafia, 17 April 2011:

‘I would like to thank you for the work that you have done, especially documenting the cultures and traditions and artefacts of the upper Sepik River people . . . I was searching for some years to really know how my people, the Abau, were living.

‘Stories and legends have been told but I also wanted to see how the traditional tools, spears and other things were made and what they looked like. When I searched through the Internet I was surprised when I saw them documented [on your website]. This really helps me to understand how my people were living in the past.’

Erik Kowa, 22 December 2011:

‘Thank you for bringing the Upper Sepik-Central New Guinea Highlands project online. I have been gleaning information from the site the last couple of days and already I have a small contingent of Abau men (and women too I hope) visiting the site. Excellent work with the dataset too I must say.’

So the website is not just for researchers and the general public but, even more importantly, specifically for the people of the areas from which the objects in the dataset have come, providing them with access to aspects of their cultural heritage and to which they can contribute should they wish to do so.

There are not many computers connected to the Internet in the study area but mobile phone ownership and use is increasing rapidly in Papua New Guinea. Access to our site through mobile devices is therefore a priority and we will re-factor the front-end in AngularJS to provide a more robust user interface compatible across a wider range of devices.