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FACES OF THE TEOUMA LAPITA PEOPLE: ART, ACCURACY AND FACIAL APPROXIMATION

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Abstract

In 2008 we completed facial approximations of four individuals from the early Lapita Culture, a seafaring people who were the first to settle the islands of the Western Pacific circa 3000 years ago. Typically an approximation is performed as a 3D sculpture or using computer graphics. We chose to sketch what we have been able to determine from the remains because the artistic conventions of drawing work with visual perception in ways that are more complementary to the knowledge, theories and methods that make up the facial approximation of human remains.

During 2004-2006, skeletal remains of the early Lapita people (ca. 3100-3000BP) were excavated from the Teouma cemetery site on Efate Island, Central Vanuatu. There is evidence that the Lapita burial practice included removing the skulls of the dead once the soft tissue had decomposed, and arranging them in secondary interment sites (Fig. 1) [1,2]. So far, 48 burials have been excavated,

Fig. 1. Teouma Lapita Burial 10: Three crania placed across the chest of a headless male skeleton. From left: 10A♂, 10B♀, 10C♂. (© H. Buckley)

with all articulated skeletons lacking skulls [3]. Only seven crania have been found, and of these only one could be matched to its corresponding mandible. After reconstruction of the fragmented facial bones there was sufficient detail for one full and three partial 2D approximations of four mature adults. Given that Lapita cranial remains are rarely excavated, these four Teouma individuals constitute the most comprehensive evidence to date as to the possible facial appearances of the early Lapita.

Undertaking an approximation involves ascertaining the likely appearance of the head and face through reference to the unique morphology of the skull, and the application of average soft tissue depths (appropriate for the population affinity, age and sex of the skull) at given craniofacial landmarks [4-7]. Not all of the recommendations for a facial approximation have validity, and some of the more speculative aspects have received justifiable criticism [8]. Related to this, while there is a great deal of literature on the likely relationship between the hard and soft tissues of the head and face, much of this is based on the extensive experience of physical anthropologists [4, 9, 10] and not all of this has been statistically verified. Although some aspects of this knowledge are being appropriately confirmed [e.g. 11], it is still the case that experience-based knowledge informs much of what we know about a face from the skull.

Although drawing is practiced by some forensic artists, it is more typical for an approximation to be performed either in clay or computer generated as a virtual 3D representation. We, however, have chosen to sketch our approximations because the artistic conventions of drawing allow known margins of error to be incorporated into the results [12]. In particular, those margins associated with soft tissue depths, age, population affinity and the often absent mandible.

A drawing is an impoverished representation of the head and face in that relatively few details are included. This paucity of information requires a viewer to 'fill in' what is missing, and it is the viewer's role in completing the picture that gives a drawing much of its visual appeal [13,14]. Because a drawing only uses a limited amount of information, it is important that both line and mass clues are depicted [15]. However, these lines and shadows can have more than one depictive function; shading can be used to suggest facial masses, receding
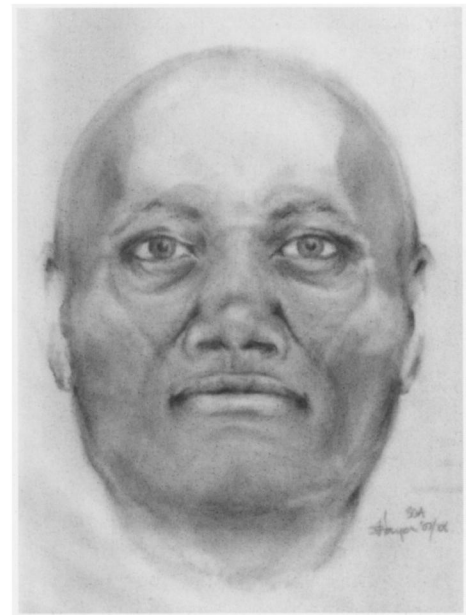

Fig. 2. Teouma Lapita 30A♀. (© S. Hayes)

edges and cast shadows [16]. Part of the technique of drawing is that mass, edge and cast shadow information can be quite literally blurred, and this is a very useful convention for producing an approximate likeness based on the skull.

By choosing to sketch the Lapita faces we are able to display a breadth of soft tissue depths at key landmarks, particularly those concerned with overall facial shape. The accuracy of soft tissue depths is dependent on knowing population affinity, sex, body mass and approximately how old the person was at their time of death. Although this can often be determined within acceptable levels for relatively recent remains, this is not always the case with archaeological crania, particularly given the effect of weathering on the bone. So, by drawing the head with slightly blurred facial boundaries, we are able to represent a mature adult facial form that incorporates not just the mean, but also the standard deviations of soft tissue depths, and therefore elide the implication that we know, for example, the precise age of the deceased.

In addition to using shading, another artistic convention that we have usefully incorporated into our results is head pose. The greatest area of diversity in soft tissue depths relating to population affinity are located on the mandible [17]. Given that the population affinity of the Lapita people has yet to be clarified despite the growing skeletal and genetic record [18-21], our facial approximation of the complete skull (Fig. 2) needs to be particularly careful regarding the depths associated with the jaw. Recommenda-

tions for facial approximations are that the head position corresponds to the anatomical Frankfurt Horizontal Plane, or that it is canted to one side or tipped forwards slightly for a more natural appearance [6]. However, holding the face upwards and forwards at an angle of 13° when standing is also a normal pose [22], and very usefully serves to tuck the angle of the jaw behind the lower cheek and jowls, while at the same time shifting the lower edge of the chin away from the neck. This pose focuses the visual information on the likely shape of the soft tissues of the chin, but not its inferior depth. In other words, both the incorporation of blurred edges and a slightly upward tilt to the head position allows us to show what it is we know about the shape of the jaw and chin, but not impose a specific population affinity.

Sketching has also enabled us to take a rather unusual step in our approximation of the three individuals found interred across the chest of a headless male (Fig. 1). The remains of skulls are frequently found lacking their corresponding mandibles and it is more typical to hypothesise a mandible based on the features of the cranium [7, 23]. This is despite low accuracy rates being associated with the method [24], and that changes to the lower face have been shown to impact deleteriously on how the upper face is visually perceived [25]. The conventions associated with drawing, however, can accommodate a truncated view of the head and face (Fig. 3), and so we have been able to avoid adding an extra layer of speculation onto what is already necessarily approximate. That is, by drawing we can include only what we know with some confidence, and leave out that which is the more highly speculative.

A further, and crucial, advantage of drawing is that it is a transparent methodology. The research that we reference for each decision is clearly documented

within each layer as we build up the face from bone through to skin.

It is customary within both archaeology and forensic facial approximation to view artistic conventions as inherently subjective and therefore antithetical to the practice [8,26,27]. It is arguable, however, that our methodology shows a facial reconstruction can be effective, and possibly more accurate and objective, *because* it draws on artistic conventions.

We did not want to see just one face of the Teouma Lapita people; an individual does not adequately represent the diversity of any group. By interweaving the art of representation with the science of archaeology, biological anthropology, forensic facial approximation and visual perception, we have been able to represent the approximate appearance of four people from the Lapita colonisation phase of the settlement of the Pacific Islands some 3000 years ago.

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Fig. 3. Teouma Lapita truncated facial approximations. From left: 10A♂, 10B♀, 10C♂. Although it appears that the central cranium (10B♀) was buried with her corresponding mandible (see Fig. 1) it belongs to another individual. (© S. Hayes)