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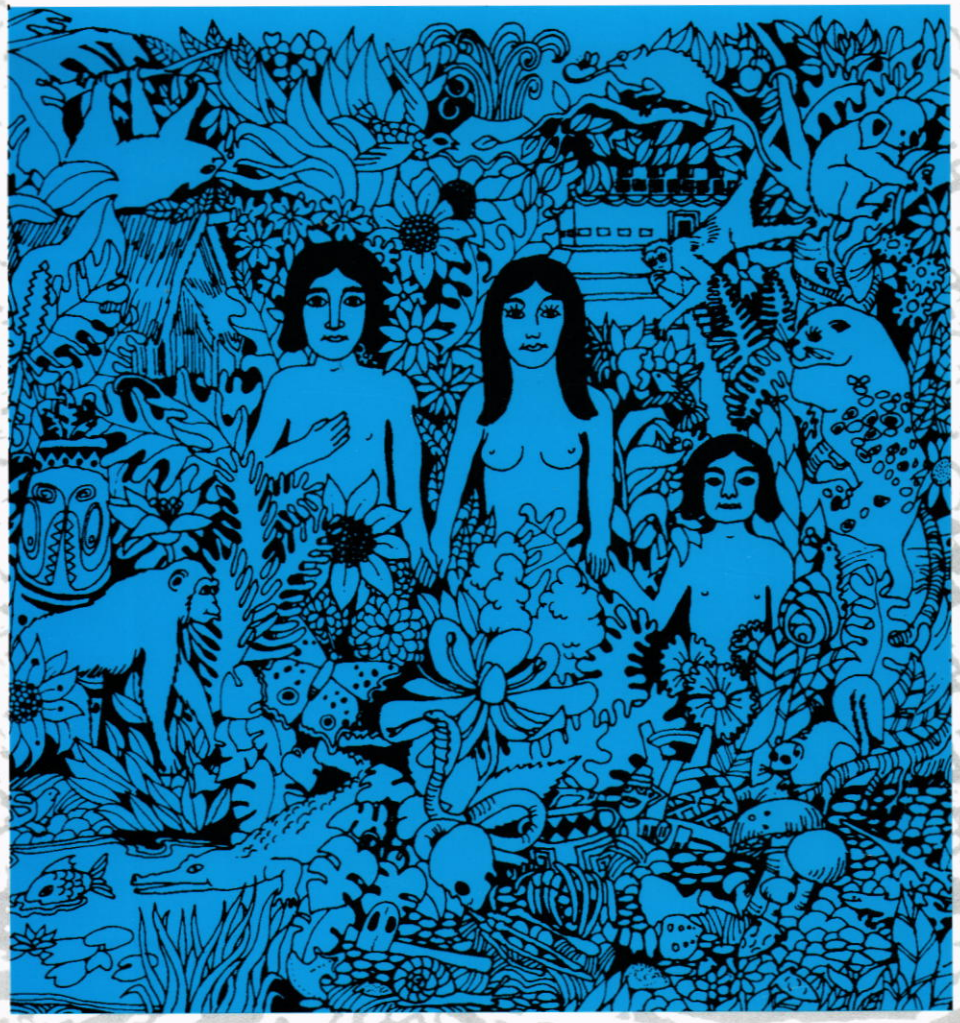

FIFTY YEARS IN THE FIELD. ESSAYS IN HONOUR AND CELEBRATION OF RICHARD SHUTLER JR'S ARCHAEOLOGICAL CAREER

Edited by Stuart Bedford, Christophe Sand and David Burley

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NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION MONOGRAPH

OLD SITES, NEW INSIGHTS: A REANALYSIS OF THE 1952 GIFFORD AND SHUTLER NEW CALEDONIA COLLECTIONS

Christophe Sand, Patrick V. Kirch and James Coil

INTRODUCTION

Between February and August 1952, Edwin W. Gifford, then 64 years old and a respected senior Professor at the University of California at Berkeley, assisted by his student Richard Shutler Jr., conducted the first professional archaeological program ever carried out on the Grande Terre (Main Island) of New Caledonia. It was, in fact, Gifford's second archaeological foray into the Pacific (the first having been Fiji, see Gifford [1951]), and part of the post-World War II revitalisation of Oceanic prehistory (Kirch 2000:27-28). Accompanied by their wives, Mrs Delila S. Gifford and Mary-Elizabeth Shutler, over a seven month-long field season they surveyed 53 sites on the west and east coasts, and excavated at 11 of these. The publication of their joint monograph in 1956 (Gifford and Shutler 1956), with the inclusion of the first list of radiometric dates for the Western Pacific, was a watershed event in the emerging field of Oceanic archaeology (Kirch 1997a).

The material discovered by Gifford and Shutler, and the conclusions proposed by this American team, widely influenced succeeding generations of archaeologists working in the region. In 1959, the newly appointed lecturer of Prehistory at the University of Auckland Jack Golson, structured much of his pioneering summary of Melanesian Island prehistory on the data from the 1956 volume (Golson 1959:11-12, 29-38). Having perceived the significance of the "Lapita" sites in the understanding of the first period of settlement of the region, first dated after the 1952 excavation of Site 13, Golson initiated new field programmes and sent students to several islands of the region (Golson 1961). One such student was Colin Smart, who excavated several ceramic sites in southern Grande Terre, in order to expand upon the data obtained by Gifford's 1952 expedition (Smart n.d.). Drawing upon these emerging results, Green (1968) and then Golson (1971) both proposed in the early 1970s a regional chronological ceramic model, once again relying heavily on Gifford's Fijian and New Caledonian data for regional comparisons. In the 1970s and 80s, studies on New Caledonian ceramic chronology by Daniel Frimigacci (1975), Roger Green and John Mitchell (1983), and by Jean-Christophe Galipaud (1988, 1992), continued to draw upon Gifford and Shutler's monograph. Indeed, Gifford and Shutler (1956) remains a cornerstone of New Caledonian archaeology.

In the 1990s, a local archaeological programme expanded the research design (Kirch 1997b), by paying attention to topics such as prehistoric settlement patterns, socio-political evolution, landscape transformations, burial customs and so forth (e.g. Sand 1995, 1996a). With ceramic typology remaining the best chronological marker throughout the archipelago, efforts have been made over the past decade to refine this typology. These efforts demonstrated that a whole series of questions remained to be solved, ranging from a precise chronology of the Lapita period to the proper definition of the post-Lapita wares. A reappraisal of the last ceramic tradition of northern New Caledonia – the Oundjo tradition – highlighted a serious lack of data which had been recovered since the 1952 excavations, with four out of the five available C14 dates coming from the Gifford and Shutler publication (Sand 1996b:22).

As only one full-time research team currently works in New Caledonia, limiting the number of new sites which can be excavated, a re-study of the 1952 Gifford-Shutler collection at the Phoebe A. Hearst Museum of Anthropology (PAHMA) in Berkeley, offered an excellent avenue to potentially get answers to key questions. Green had already pointed to the richness of Gifford and Shutler's field and catalogue data, as these had provided the basis for a reshaping of the New Caledonia chronology proposed in 1983 (Green and Mitchell 1983). In the early 1990s, Kirch likewise returned to the collections, when he directed Berkeley archaeology students in a reassessment of the materials from Sites 13, 14, and 26 (Kirch *et al.* 1997). This re-examination of materials indicated that high-quality information could be further extracted from the earlier excavations using new methods and approaches. An initial visit to Berkeley by Sand in 1999, confirmed the continued potential of working with the

collections. A research programme focusing on a partial reanalysis and an intensive redating program of the 1952 excavations was devised for 2001. This program was conducted simultaneously in two parts. A University of California course in archaeological laboratory methods (Anthro 132) was taught in the spring semester of 2001, by Kirch with the assistance of James Coil. In tandem, a 10-day visit by Sand focused on reconstruction of the site stratigraphies, identification of the relationships of the layers with corresponding archaeological material, and selection of representative wood samples for AMS C14 dating.

This paper is one outcome from that project. We propose – some 50 years after the original completion of the New Caledonian expedition – a reworking and redating of the excavations conducted by E.W. Gifford and R. Shutler Jr., as a tribute to this pioneering work in Pacific archaeology.[1]

SYNOPSIS OF A REVOLUTIONARY PROJECT: THE 1952 ARCHAEOLOGICAL EXPEDITION TO NEW CALEDONIA

Scope of the Expedition

Following on from his successful 1947 expedition to Viti Levu, Fiji (Gifford 1951), Gifford targeted New Caledonia as the next location to continue his Pacific archaeological research. His "aim was to fill in gaps in the knowledge of New Caledonian archaeology" (Gifford and Shutler 1956:1) and the Grande Terre was the main focus. Gifford made contact with Luc Chevalier, then Director of the New Caledonia Museum, and with funding from the Viking Fund Inc. (predecessor of the Wenner-Gren Foundation for Anthropological Research), organised the seven month expedition.

The first month of their field programme was spent surveying the northern part of the Grande Terre with the help of Chevalier, and on occasion Jean Guiart, a French anthropologist based in Noumea. The first trips were up the east coast to Poindimié and up the west coast to Koumac. The major sites recorded during this reconnaissance survey were Sites 13 and 26 near Koné, and Site 6 near Poindimié. A second series of visits were centred around Noumea, towards Païta and La Foa on the west coast and Canala and Yaté on the southeast coast. Finally, the group surveyed the Tiouandé area on the north-east coast in June. In all, 53 different sites were described by Gifford and Shutler in their monograph, with a small set of additional neighbouring unnumbered sites.

Field Methods and Sites Excavated

After identifying a number of sites with excavation potential, the second objective of the New Caledonia expedition, that of systematic excavations, commenced. Gifford, although known primarily as an ethnographer, had considerable prior experience working on shell-mound features in California (e.g. Gifford 1916, 1949). As described in more detail by Kirch (1997a:6-7, Sand and Kirck, 2002), Gifford used a set of methods then current in Californian archaeology. Key to this methodology was the horizontal/vertical control system of "rectangles" (3 x 6 foot grid units [about 90cm x 180cm]) and 6-inch "levels" (about 15cm), which essentially paid little regard to natural stratigraphy. Californian excavators of this period (such as the famous Robert Heizer), felt that this method of "artificial stratigraphy" was more "scientific" and allowed for systematic comparisons between sites. The New Caledonian excavations were thus conducted by shovel removal of the cultural deposits in artificial 6-inch levels, screening of the excavated dirt using sieves with either 1/2 or 1/4-inch mesh on site, and collecting the archaeological material for study (see Figure 1). In general, shellfish and other invertebrate remains were weighed, a sample of each different species from each level was retained for further identification, and the

FIGURE 1. Gifford's method of trench excavations with alternating squares. Washed screening on the right. Site 20.

1. Detailed results of the ceramic analysis, and reanalysis of bulk sediment samples, carried out by the students in Anthro 132 will be published elsewhere.

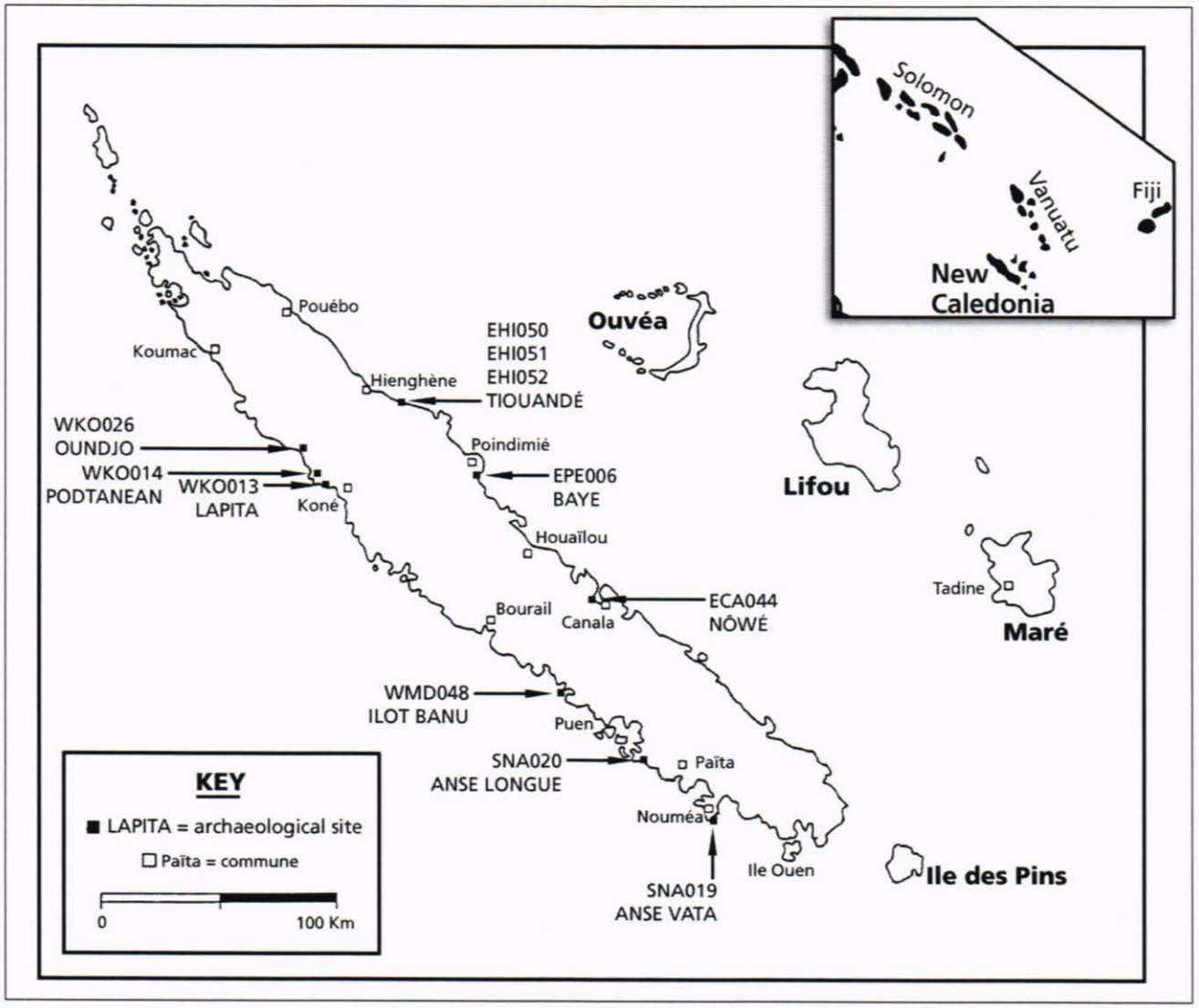

FIGURE 2. Location of the sites excavated by Gifford and Shutler on the New Caledonian Grande Terre in 1952.

remainder discarded. All bone (human and animal), ceramics, worked stone, and other artifactual material were also retained and carefully catalogued. A black-and-white photographic record was kept of excavations at all sites, usually showing representative views of the excavated faces; color slides were also taken but these are for the most part "touristic" views, rather than documentation of the excavations.

Critically important for our project, however, was that *bulk samples* of standardised volume of sediment per level were also taken, as "column samples" from the faces of selected excavation units (these same units were usually also photographed at the time). This aspect of Gifford's field methodology also reflected his California shell-mound experience, where he had spent considerable time studying the micro-content of the mounds. Gifford called this approach "residue analysis", and his New Caledonia bulk samples were fine-sieved in the Berkeley Museum, with the micro-contents being analysed by a number of experts. The bulk sediment remaining after fine sieving, however, was retained and catalogued in the Museum. The existence of these bulk sediment samples, fortunately, allows us to reconstruct the natural stratigraphy of his sites, as first demonstrated in the reanalysis of Sites 14 and 26 (Leonard 1997). Here we report our general reconstruction of stratigraphy; elsewhere we will publish details of the laboratory reanalysis of the bulk sediment samples.

The 1952 excavations varied in extent between sites, from 3 rectangles at Site 48 on Banu Island, to 37

rectangles at Site 19 at Anse Vata. Each "rectangles" measured 6 by 3 feet, with units often laid out in a row or transect, in which some units were not excavated.

On the west coast of the Grand Terre (Figure 2), from the south to the north, six sites were excavated. Site 19 at Anse Vata near Nouméa (SNA019) revealed a thoroughly disturbed stratigraphy, with ceramic material of different types mixed together, and mostly restricted to the surface layer; one burial pit was also encountered. At Site 20, located at Anse Longue (WPT020) on a sandy plain of the Païta coast, deposits went down to a depth of 60 inches, and two major ceramic types were identified, although there was much disturbance in the upper layers. Contrary to Site 48 on Banu Island, which revealed little data, excavations at Site 13 at Lapita (WKO013) and Site 14 at Podtanean (WKO014) revealed the presence of deeply-buried and rich remains. At Lapita (the local toponym which gave name to the cultural complex), Gifford and Shutler recorded a large variety of dentate-stamped sherds, as well as paddle-impressed sherds also found in the lower layers of Site 14. Numerous rectangles opened in different parts of Oundjo tribal locality (Site 26, WKO026) yielded only a single ceramic type.

On the east coast, from the south to the north, five sites were excavated. Site 44 of Nôwé (ECA044), located on and near a late prehistoric Kanak village, was composed of shallow deposits. This was not the case at the large site at Baye (Site 6, EPE006) south of Poindimié, where 25 rectangles were opened, revealing deposits up to 96 inches deep, with clear differences in the ceramic material. This was also the case of the excavations of Site 50 on the seashore of Tiouandé (EHI050), but not of the nearby excavations of Sites 51 in Tiouandé tribal locality (EHI051) and 52 at nearby Ouapa (EHI052).

The Collections Today

With the exception of the weighed and discarded shellfish, all of the materials recovered by Gifford and Shutler from the screens were shipped back to Berkeley, where they were meticulously catalogued over the course of the following year. Cataloguing was done by hand, with India ink in a type of large bound ledgers which had already served the University of California Museum of Anthropology for half a century (since 1989 known as the Phoebe A. Hearst Museum of Anthropology [PAHMA]). The ledger entries recorded material type as well as key field provenience data (site, rectangle [unit], depth [in 6-inch increments]) which allows one today to reconstruct - within the limits of the rectangle/6-inch increment framework - the three-dimensional context of the site. The New Caledonian expedition collections have PAHMA catalogue numbers of 11-15001 through 11-31961; human skeletal remains from the expedition have catalogue numbers of 12-8579 to 12-8631.

Today the collections are essentially in the same physical condition as when they were initially curated. They are stored in the same standardised wooden trays that the Museum has used for most of its history; each tray generally contains the entire contents of one or more excavated 6-inch levels of a particular rectangle and site. All materials from a single level are thus curated together, with the exception of special finds such as "illustrated objects" (those which appeared in the plates in Gifford and Shutler [1956]). The bulk sediment samples are also curated together as a set. These were housed in small cardboard boxes until recently, when we re-housed most of them because the boxes were decaying and leaking their sediment contents.

With Gifford and Shutler's 1956 monograph to hand, which gives plan maps of the excavations (absolutely essential to determine the spatial layout of the rectangles and their relationship to the surrounding terrain and geographical features), one can systematically work through the collections and reconstruct major aspects of any of the sites, both vertically and horizontally. Of course, it has to always be kept in mind that the "rectangles" were dug without reference to natural stratigraphy.

GIFFORD AND SHUTLER'S C14 DATING

After the completion of their expedition and the arrival of the collections in Berkeley, Gifford selected some samples of charcoal for radiocarbon dating which was carried out by Professor H.R. Crane at the University of Michigan. This innovative dating method had been developed in the late 1940s by W.F. Libby, and was still in its infancy. Charcoal samples of between 50gm and 100gm were then needed, pre-treatment was simple, no control of possible contaminants were made, and the results obtained on the primitive solid-carbon counting machine had a wide standard error. Nevertheless, this new technique allowed for the first time to get "real" dates for archaeological sites.

In all, nine charcoal samples from New Caledonian sites were dated and reported in the 1956 monograph (Gifford and Shutler 1956:89-92), along with four dates from the Fijian sites Gifford had excavated in 1947 (see Gifford 1951). Unfortunately, the squares of origin were not published with the results, making it difficult to relate the dates to discrete sets of archaeological material. By referring to the original handwritten catalogues in the Hearst Museum, this missing information has been obtained. The earliest dates came from site WKO013 of Lapita, with results of 2800 ± 350 B.P. (PAHMA Cat. No. 15631, 29,7gm) for samples taken at 24-30 inches in square C1-2/D1-2, and 2435 ± 400 B.P. (PAHMA Cat. No. 16226, 33gm) for samples taken at 30-36 inches in square C1-2/D1-2. At site WKO014, a date of 1700 ± 300 B.P. (PAHMA Cat. No. 15660, 62,7gm) was obtained from 42-

48 inches in square C2-3/D2-3; this unit was characterised by paddle-impressed sherds. The lowest layer of site EHI050 at 78-84 inches in square A1-2/B1-2, characterised by a marshy infilling, was dated to 1880 ± 350 B.P. (PAHMA Cat. No. 15237, a preserved root). At nearby Location A of site EHI051, a late prehistoric occupation from 12-18 inches in square C1-2/D1-2 was dated to 385 ± 300 B.P. (PAHMA Cat. No. 16544, 51gm). Square A9-10/B9-10 at a depth of 24-30 inches in Location B of site EPE006, was dated to 615 ± 300 B.P. (PAHMA Cat. No. 16362). Two dates came from site WKO026, with a result of 905 ± 300 B.P. (PAHMA Cat. No. 15749, 93gm) for square A8-9/B8-9 of Location B at 30-36 inches, and 785 ± 300 B.P. (PAHMA Cat. No. 15788, 89gm) for square A7-8/B7-8 of Location C at 24-30 inches. Only one date was obtained for southern Grande Terre sites, with a result of 1335 ± 300 B.P. (PAHMA Cat. No. 15321, 53gm) from 36-42 inches of square A14-15/B14-15 in site WPT020.

The Chronology Proposed in 1956

Attempting to synthesise the data they had obtained in the 1952 expedition, Gifford and Shutler proposed to characterise New Caledonia's prehistory as being completely related to ceramic groups. Politely refuting the hypothesis advanced at that time by geologist Jacques Avias, with respect to a Palaeolithic occupation of the archipelago (Avias 1949, 1950), Gifford showed that at all the excavated sites, human occupation was associated with ceramics (1956:24), and that the oldest remains dated were from layers containing dentate-stamped sherds, at Site 13 of Lapita. Widening the regional relationships between sites with dentate-stamped sherds first recognised by Avias (1950), Gifford expanded the known limits of this seemingly important pottery style to Fiji and Tonga. Although able to identify amongst the New Caledonian sherds clear differences between sites and regions, Gifford did not attempt to define a formal ceramic chronology. He simply noted regional similarities and tried to compare the decorative motifs present on the sherds.

NEW POSSIBILITIES: REDATING OF THE GIFFORD AND SHUTLER COLLECTION

Some Research Issues

Expanding on the terminology proposed in 1983 by Green and Mitchell, Galipaud presented at the end of the 1980s, as part of his PhD thesis, a ceramic chronology divided into two periods, Koné and Naïa-Oundjo (Galipaud 1988, 1992). Subsequent critical evaluation of this chronology did however show that a whole series of research problems remained (Sand 1995). For the early Koné period, spanning roughly the first millennium B.C., these ranged from a proper definition of the characteristics and duration of the Lapita production period, to a proper understanding of the immediate post-Lapita ceramic typology. For the later Naïa-Oundjo period, comprising roughly the first and second millennia A.D., research questions mainly related to the northern part of the Grande Terre, where even the basic typological characteristics of the Balabio tradition were unknown. The chronology and internal changes relating to the late Oundjo ceramic tradition were also poorly understood. To a lesser degree, the same research questions also applied to the Plum and Néra traditions of the south of the Grande Terre.

New field programmes have begun to solve some of these questions, specifically regarding the chronology of the Lapita period (Sand 1997, 2000), as well as post-Lapita ceramic evolution (Sand 1996a, 1999). But there is still a whole set of research issues which remain to be solved, especially in relation to the chronology of the northern Grande Terre.

One of the goals in undertaking a re-examination of the Gifford and Shutler collection has been the further refinement of the New Caledonian ceramic chronology. The concentration in the northern part of the main island of the deepest excavations, allowed us to target some sites for a more precise understanding of succeeding typological transformations. Site WKO014 of Podtanean (Site 14), the deepest of all excavated sites and the most diverse in ceramic material, was central in this program, along with another two deep sites on the east coast, EPE006 of Baye (Site 6) and EHI050 of Dowalwoué (Site 50). Chronologically more limited sites such as site WKO026 of Oundjo (Site 26), or less rich sites such as EHI051 of Tiouandé (Site 51) were also studied, in order to answer more specific chronological questions. Sites in the southern part of the Grande Terre, known to have less reliable stratigraphies with heavy mixing in some cases, were given less attention, although a better understanding of sites ECA040 of Nôwé (Site 40) and WPT020 of Anse Longue (Site 20) was attempted.

Stratigraphies of Major Sites and Related Archaeological Material

Here we offer a reinterpretation of site stratigraphy (Figure 3) that we have been able to reconstruct using field notes and photographs, bulk sediment samples, and laboratory analyses.

Site EPE006 of Baye. Site 6 is located on the east coast of New Caledonia a mile or two south of Cap Baye, and 1.5 miles south of Paama, Site 5. Mangrove swamps dominate the local vegetation and black deposits, heavy with pumice and sand, constitute the overall ground surface. Located in close proximity to the coastline, Baye possesses large

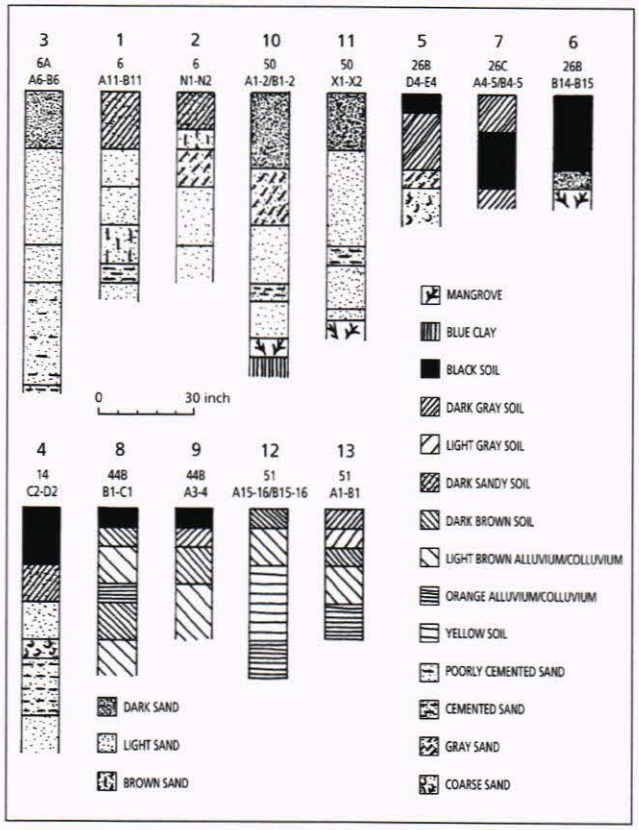

FIGURE 3. Reconstructed stratigraphies of the 1952 excavations.

shellfish middens, referred to by Gifford and Shutler as "kitchen middens" (1956:12). Baye is one of the largest excavations that Gifford and Shutler carried out in New Caledonia. The excavated sections comprised five areas: 6, 6A, 6B, 6C, and 6D. Area 6 is at the foot of a rocky hill next to the road. The other four areas are approximately 300-400 feet northwest from Site 6, and all are in close proximity of each other. Area 6 was thought to be "kitchen midden" while area 6A was said to have been a chief's hut/house. A total of 199 6-inch deposits were excavated from Site 6. Area 6 possessed 11 levels and area 6A had 16 6-inch levels. These areas were excavated deeper than any of the other units because of the amount of material found, in particular ceramic sherds (plain body and rims), some handles and a few decorated sherds in the deepest units.

Each of the five different locations excavated had a different stratigraphy. The best preserved stratigraphies were from the main excavation 6. In profile A11-B11, six layers have been identified. The upper layer (I) is a dark terrigenous soil about 18 inches thick, with Oundjo pottery as the main archaeological characteristic. Layer II, 12 inches thick, is a fine white sand, with thin pottery and a handle. Layer III, of the same thickness, is formed of yellow fine sand. Fine sherds, some with appliqué decorations, are mixed with eroded small sherds bearing incised decorations characteristic of the late Koné period. The three lower sandy layers lack archaeological materials, with the presence of cementation at some places. In profile N1-N2, five layers have been identified. Layer I, about 12 inches deep, is formed of dark terrigenous soil, and includes Oundjo sherds. Layer II, about 6 inches thick, is a brown sand, covering the 12 inches thick gray sand of Layer III. These two strata contain thin sherds. Layer IV is a white fine sand 18 inches thick, whose upper part includes mixed early material, extending from the lower part of Layer III. Finally, Layer V is a yellow sand lacking cultural materials.

Profile A5-B6 in Location A, located near the present-day seashore, can be subdivided into five different layers. The upper layer (I) is a thick fill of a prehistoric house-mound, with a dark sandy texture. The ceramic material here is exclusively of Oundjo tradition sherds. Layer II is a clear fine sand about 30 inches thick, whose upper part contains Oundjo sherds. Layer III, 12 inches thick, is a yellow fine sand. Layer IV is of light yellow colour, about 30 inches thick, getting more and more cemented, with the base of the section formed by a hard sand crust (Layer V). All the lower layers appear to have witnessed regular mixing through wave action, with mostly eroded, small sherds. This seems also to be the case of the lower layers of the other locations excavated near the seashore, indicating a fairly recent progradation of this part of the sand dune.

Site WKO014 of Podtanean. The excavation conducted at Site 14 revealed the deepest stratigraphy of the whole New Caledonian expedition. One rolled dentate-stamped Lapita sherd has been identified in the surface collection, pointing to a possible destroyed Lapita layer in the area. A general reconstruction of the stratigraphic succession has been attempted with profile C2-D2 (see also Leonard 1997:22-23 for laboratory analysis of these sediments). Layer I is a black soil about 18 inches thick, with often fragmented Oundjo pottery sherds. This layer is probably an old planting ground. Layer II is a more sandy black deposit about 12 inches thick, with thinner sherds. Layer III is a dark fine sand of similar thickness, with thin ceramic material going progressively having out-curved rims and some sherds bearing consolidated sand, out of context. Gifford noted that a thin black horizon, probably corresponding to a hearth, was present between Layers II and III. Layer IV is a coarse sand with rolled pieces of coral, about 6 inches thick. Fresh and rolled sherds with adhering cemented sand are present in this layer, which also has the highest proportion of paddle-impressed sherds. The presence of a cooking pit might explain part of the mixing identifiable in this layer. Layer V is a

consolidated sand formation about 18 inches thick, with archaeological material covered by sand concretions. Sherds are mostly paddle-impressed, with out-curved rims, some having clear signs of rolling. In the nearby square A1-2/B1-2, a series of well-preserved sherds in the level 66-78 inches might indicate the presence of an *in situ* horizon not identified by Gifford during the excavation. Layer VI is an unconsolidated fine sand, under the cemented formation: no archaeological material comes from this lowest layer.

Site WPT020 of Anse Longue. Site WPT020 on the sea-side of Païta, as SNA019 in Nouméa, had stratigraphies which demonstrated extensive mixing. A brief study of the ceramic material of this site was conducted. It indicated that sherds from the top 12-18 inches of the stratigraphy comprise mostly thin Néra tradition sherds, while the lower section of the stratigraphy, which was up to 36-42 inches deep in some squares, contained sherds relating to the earlier Plum tradition.

Site WKO026 of Oundjo. The excavations conducted inside the Oundjo tribal locality showed the presence of a distinctive homogeneous ceramic type, present in the three locations excavated. Location A displayed the simplest stratigraphy, with a terrigenous topsoil about 12 inches thick (profile A14-A15), resting on a brown substratum. Location B was on a talus slope near the sea, and reached waterlogged subsoil in some areas above the base of the cultural deposits, leading Gifford and Shutler to terminate the excavations before the deepest cultural layers were reached. Four layers have been identified in profile D4-E4. The upper layer (I) is a black soil about 6 inches deep, resting on a dark-gray soil, forming the 18 inches thick Layer II. Layer III is a dark-gray sand about 6 inches thick, above a 16 inches thick coarse sand. This Layer IV is still full of sherds, and does not appear to be the base of the cultural deposit. Nearby profile B14-B15 was also formed by four layers. The upper Layer I, 6 inches thick, is a black soil. Layer II, 18 inches thick, has the same general texture but with more shell remains. Layer III is a thin horizon of rotten sand, above a wet clay mangrove-like sediment forming Layer IV. The base of the stratigraphy was clearly not reached in this square.

Location C, opened on a slope on the central plaza of the Oundjo tribal locality, showed a land-type form of stratigraphy, with no marine input. Four layers, all with different terrigenous soil formations, were identified. Most of the ceramic material is concentrated in the top 24 inches, with only one sherd below 30 inches.

Site 44 of Nôwé. The abandoned Kanak habitation site of Nôwé is located on the bank of a tributary of the Negropo River, in the Canala area of the southeast coast. Three areas of the site were excavated, numbered Locations A to C. The ceramics from this site exhibit a mixed component of Oundjo and Néra tradition ceramics. No new excavations have been conducted in Canala since 1952.

Location A, positioned close to an old village, has no discernable stratigraphy, the top 18 inches of black soil resting directly on red ochre bedrock. All the material appears to be mixed, with handles typical of the first millennium A.D. on the surface, and European material being recovered from up to 12 inches deep. A fairly similar description can be made of Location C.

Location B, located on the bank of the river, has a stratigraphy that can be divided into six layers in profile B1-C1. The top layer (I) is a black soil about 6 inches deep, covering a brown soil of the same depth (Layer II). In these deposits, late prehistoric ceramics and introduced European material are present. Layer III is a light brown alluvium, 12 inches in depth, with the top part rich in Oundjo-like sherds, but a sharp decrease in the lower part. Layer IV is a 6 inches thick orange alluvium, covering a 12 inches thick dark-brown alluvium. This layer has sherds in its upper part, with one paddle-impressed sherd. Layer VI is a light brown alluvium with no ceramics, but the sediment has charcoal particles present. Profile A3-4 has less clear differences, with a top layer (I) of black soil about 6 inches deep, mostly with European goods, covering Layer II, of same thickness, more greyish, with mixed late prehistoric and European material. Layer III is a dark brown alluvium about 12 inches thick, with fewer sherds, and Layer IV a light brown alluvium with only a few sherds in its upper part. Although, as already identified by Green and Mitchell (1983), European historic contact period material is present in the upper layers of most of the sites excavated in 1952, nowhere is the density and diversity as dominant as at Site 44.

Site EHI050 of Dowalwoué. This site, located near the seashore of the Tiouandé River, was excavated up to a depth of 82 inches. Two closely similar profiles have been reconstructed, for units B1-B2 and nearby X1-X2. The upper layer (I) is formed of a black, terrigenous sediment, between 18-24 inches thick. The ceramic material found in Layer I is predominantly of Oundjo type. A fine to coarse sand of gray colour, with few cultural materials, extends for the next 18 inches (Layer II), followed by a series of different more or less cemented coarse sand deposits with thin-walled ceramics (Layers III to V), comprising about 36 inches of deposit. These rest on a black clay subsoil with numerous preserved root remains, and candlenut (*Aleurites moluccana*) and coconut (*Cocos nucifera*) endocarps (Layer VI) (identifications by Sand); the base of this deposit turns to blue clay (Layer VII). The presence of

this low marshy component as well as the partial cementation of some of the sandy layers points to probable low amplitude sea level fluctuations in this region.

Site 51 of Tiouandé. Two areas were excavated in 1952 at the base of the uplifted limestone formation where the Tiouandé tribe is located. The main excavation was on the slope at the foot of the cliff, and showed a succession of colluvial sediments with mostly small sherds. In square A15-16/B15-16, downslope, four layers have been distinguished. Layer I is a brown soil about 6 inches thick, covering a light brown soil about 12 inches thick. These two top layers have numerous sherds, and show some mixing, with early paddle-impressed sherds in the upper part of Layer II. Layer III is a yellowish soil 24 inches deep, with some paddle-impressed sherds and one carination in the top 6 inches. The lower part of the layer is sterile, as is the underlying Layer IV. The best stratigraphic succession of Site 51 is in profile A1-B1, with 5 differentiated layers. Layer I is a dark gray soil, covering the light gray soil of Layer II. These two upper layers, each 6 inches deep, enclose mostly Oundjo tradition pottery. Layer III, of same thickness, is dark brown in colour and encloses thinner-walled sherds with incurved rims. Layer IV, formed of light brown colluvium about 12 inches thick, has the same type of sherds in his upper part, mixed with paddle-impressed sherds, and mostly paddle-impressed in it's lower part. Finally, Layer V, an orange-like colluvium, has only a few sherds in its upper part.

Location A of Tiouandé showed a fairly simple stratigraphy, with a top layer formed of black soil, up to 12-18 inches deep, all mixed, covering a sterile brown sediment. All the ceramic material of the upper layer is related to the Oundjo tradition, indicating a fairly recent formation.

Selection and Identification of Charcoal Samples in the Hearst Museum

During a visit to UC Berkeley in the spring of 2001, Sand selected 25 charcoal samples from the E.W. Gifford Collections to be submitted for AMS radiocarbon dating. These samples were chosen to represent materials from well-provenienced stratigraphic layers from seven sites. Taking advantage of the fact that AMS dating requires only small samples, Sand selected a single charcoal fragment from each provenience. Before samples were sent to Beta Analytic, Coil examined these fragments as well as others from the same matrix, to attempt taxonomic identification, and to select fragments for dating which represented short-lived taxa or materials without inbuilt age. The goal here was to minimise the potential for "old-wood bias" in the dated fragments (Bowman 1990).

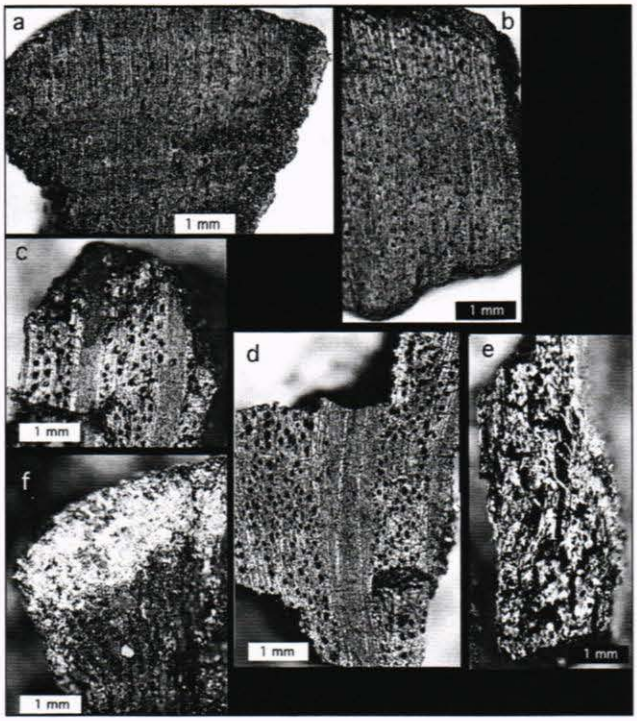

FIGURE 4. Photomicrographs of charcoal fragments fragments from this study (high magnification prevents full-frame focus).
a) Site 6, 11-16366, cf. *Aleurites* sp., AMS fragment.
b) Site 6, 11-16368, cf. *Aleurites* sp., AMS fragment.
c) Site 14, 11-15652, cf. Casaurinaceae (Ironwood family), AMS fragment.
d) Site 14, 11-15652, cf. Casaurinaceaenon-dated fragment.
e) Site 50, 11-16445, Dicotyledon wood, showing distorted structure typical of some fragments in this study.
f) Site 26B, 11-15060, Dicotyledon wood, showing mineral 'crust' typical of some fragments in this study.

Several methods can be used to help minimise the potential for inbuilt age or "old-wood bias" to affect radiocarbon age determinations: 1) Date charcoal from plant taxa known to have short life-spans, such as weedy shrub taxa; 2) Date charcoal from young parts of trees or shrubs (such as small diameter twigs); 3) Date reproductive parts of trees which grow during a single year (such as seeds or nut shells); and, 4) Date charcoal which appears to derive from the most external growth rings of a branch or trunk's radius.

Charcoal identification methods used in this study were adapted from those of Leney and Casteel (1975). Microscopes used were a Nikon stereoscopic (10-40x) and Zeiss BF/DF metallurgical (40-400x). Reference materials were from the collection of Pacific Island woods curated at the U.C. Berkeley Oceanic Archaeology Laboratory

Sample	Site	PAHMA Cat No.	N	Taxon Group of Dated Fragment	Sample notes
Phase I					
CSNC 147	6	11-16366	2	Dicot. Wood, cf. *Aleurites* sp.	2 wood types in sample
CSNC 148	6	11-16367	1	Dicot. Wood	
CSNC 149	6	11-16368	8	Dicot. Wood	3 wood types, unidentified parenchyma
CSNC 150	14	11-15652	7	Dicot Wood, cf. Casaurinaceae	3 wood types
CSNC 151	14	11-15659	9	Dicot. Wood	Several wood types
CSNC 152	14	11-15654	1	Dicot .Wood	Mostly ash, 1 charcoal fragment
CSNC 153	14	11-15661	4	Dicot. Wood	
CSNC 154	26B	11-15060	5	Dicot. Wood	3 wood types
CSNC 155	44B	11-16271	4	Seed endocarp, cf. *Aleurites* sp.	Carbonised Nut Shell , contains *Aleurites* wood also
CSNC 156	50	11-16445	5	Dicot. Wood	1 wood type, Burned wet?
CSNC 157	50	11-16237	20+	Dicot. Wood/root	Gifford's "peatlike vegetable material" Partially carbonised dicot. Root or stem?
CSNC 158	51	11-16514	14	Dicot. Wood, cf. Fabaceae	5 wood types
CSNC 159	51	11-16516	12	Dicot. Wood	5 wood types
CSNC 160	51	11-16517	3	Dicot. Wood	
CSNC 161	20	11-15025	1	Dicot. Wood	
Phase II					
CSNC181	6	11-16361	1	Dicot. wood	
CSNC182	6A	11-16401	2	Dicot. wood	
CSNC183	6B	11-16420	7	Dicot. Wood, cf. Fabaceae	All 1 wood type
CSNC184	14	11-15643*	7	Dicot. wood	Several wood types
CSNC185	14	11-15655	0	Sediment ped w/Charcoal flecks	
CSNC186	50	11-16468	1	Dicot. wood	
CSNC187	51	11-16513	11	Dicot. Wood, cf. *Artocarpus* sp.	Also contains cf. *Aleurites* sp.
CSNC188	51	11-16515	9	Dicot. Wood, cf. Fabaceae	At least 3 wood types
CSNC189	20	11-15348	7	Dicot. wood	Some fragments saturated w/salts
CSNC190	20	11-15349	6	Dicot. Wood	Some fragments saturated w/salts

*: Sand's sample form listed catalogue #11-15649 to be used as CSNC184. However, the sample I found in the bag of selected samples was #11-15643 (which appeared to have a 9 as the final digit on the box label, but which was clearly 15643 on the inner paper label). These two catalogue #'s come from very similar site proveniences, and #11-15643 was the number actually dated.

TABLE 1. Summary of sample characteristics and taxonomic identification of fragments submitted for dating.

(OAL), including collections from Hawai'i, French Polynesia, and the Cook Islands. Identification of charcoal and submission of samples for AMS dating took place in two phases, the first set of 15 samples in July, 2001 and the second set of 10 in September 2001.

Because the New Caledonian flora is fairly distinct from that of the Remote Oceanic islands which are best represented in the OAL reference materials, our ability to make genus/species-level identifications was limited, and most charcoal could be identified only to Subclass (e.g. Dicotyledon) or Family level. In cases where materials appeared to derive from arboricultural plants transported by prehistoric cultivators across the Pacific, more specific identifications were possible. Identifications in this study are prefaced by "cf." in most cases, since possible anatomical similarities between taxa from the New Caledonian native flora and economic plants remains unknown. Also, many of the fragments were fragile, heavily distorted by charring, or encrusted with mineral precipitates, conditions that hamper identification (Figure 4e and 4f).

Figure 4 shows photomicrographs of several of the charcoal fragments examined in this study, including some of the fragments submitted for dating. Table 1 summarises the taxonomic grouping of the dated fragments, along with brief comments.

With only a few exceptions, charcoal recovered by Gifford and Shutler derived mainly from dicotyledonous trees. Notably, none of the sample fragments appeared to derive from small twigs. It appears as though the wood burned in these samples was collected mainly from local native vegetation communities, since economic tree crop taxa were represented in only three of the samples, with charcoal identified as cf. *Aleurites* sp. (candlenut) and cf. *Artocarpus* sp. (breadfruit,) dated directly where it did occur: these two tree species, as with the coconut (*Cocos nucifera*), are pre-European introductions (Barrau 1956:103-105, 1958:52). Other remains of economic plants found in archaeological charcoal samples from elsewhere in the Pacific Islands, such as coconut endocarp or pandanus "keys", were not found in these samples, nor was charcoal from any monocotyledonous woods from plants such as palms, bamboos, or other grasses. Also not present was wood from shrubby, disturbance adapted taxa such as members of families *Chenopodiaceae* or *Amaranthaceae*, which when present in archaeological samples can represent good choices for dating because of their short lifespans. Finally, none of the samples contained wood from taxa belonging to the class *Gymnospermae* (conifers such as pine, cedar, or spruce), although we know such taxa to be present on the island.

With further study of the wood anatomy of the New Caledonia flora, more precise identification of wood from archaeological samples should be possible, enhancing the palaeoecological and archaeological information obtainable from this data source. In most of the samples in this study, dating samples unavoidably had to be selected from charcoal fragments which may contain some "old-wood bias", since many of the available samples did not contain appropriate materials to effectively minimise or eliminate this factor.

DATING RESULTS AND A REAPPRAISAL OF THE CERAMIC CHRONOLOGY OF NORTHERN GRANDE TERRE, NEW CALEDONIA

The new radiocarbon dates obtained from the Gifford-Shutler sites are presented in Table 2, with details of provenience and both conventional and calibrated age ranges. Below, we discuss some of the main cultural and chronological implications of these results.

"You didn't date a Lapita layer at Site 13!!"

If one single significant scientific result from the 1956 publication has to be identified, it would certainly be the dating of Site 13 at Lapita. The dates showed an occupation between around 800 and 400 B.C.. The presence of dentate-stamped Lapita sherds in the dated matrix was interpreted as indicating a relationship between these results and the ceramic tradition.

Our study of the collection from sites WKO013 and WKO013A excavated by Gifford and Shutler shows that this interpretation was incorrect. The testpits at Site 13 were placed at the edge of the small eroding bluff, where the stratigraphic layers with anthropogenic material are mostly terrigenous and clay-rich. All the large sherds excavated in this layer and collected from the wave-cut beach profile, were paddle-impressed sherds of the Podtanean tradition. As the Lapita strip had been occupied by Lapita potters during the preceding centuries, some dentate-stamped sherds, mostly small and eroded, had been incorporated in this sediment. This was not the case of the nearby pits of Site 13A, where the greyish *in situ* Lapita layer was excavated. But that layer is charcoal poor, and could never have furnished the 50-100 grams of material needed in the 1950s for C14 dating. Ironically though, the early dates from Site 13, used during the last 50 years as markers of Lapita settlement, did date a later event, a time when paddle-impressed pots were being produced and dentate-stamped pots had disappeared (Sand 1997).

The Podtanean Tradition Revisited

From the first trial definition of the early ceramic chronology of New Caledonia, the presence of two distinctive types of pots, mainly Lapita and the paddle-impressed Podtanean ware, has puzzled archaeologists. Green and Mitchell (1983) followed Smart (n.d.) in proposing two different cultural groups were living simultaneously in the archipelago during the first part of its prehistory, a hypothesis revived by Gorecki (1992) and more recently by Galipaud (1999). This was based on similar dates for the two traditions, along with the belief that Lapita spanned a 1500 year time period (Frimigacci 1999). Recent shortening of the overall Lapita chronology to less than 300 years has placed the relationship between dentate-stamped and paddle-impressed pots in a new perspective (Sand 2000:27). This is despite the fact that there are numerous examples of the presence of some paddle-impressed pots in Lapita contexts and even sherds bearing the two techniques together on late Lapita pots. However, site WKO014 of Podtanean remains the only excavated site of the west coast of Grande Terre with a complete chronology, allowing for an in-depth understanding of the typological evolution and the related chronology.

The lowest layer of site WKO014, with often rolled paddle-impressed sherds, has been dated to B.C. 790-430 (Beta-155355), corresponding to the end of the Lapita period. At that time, Podtanean tradition wares were also being produced at site WKO013 as well as at other sites of the Grande Terre. The observations made on the ceramic material coming from the lower layers has shown a fairly

Beta	Cat No	Square	Depth	Measured 14C (B.P.)	13C/12C Ratio	Conventional 14C (B.P.)	Calibration* 2 sigma	Context
EPE006 Baye								
155351	16368	A10-11/B10-11	36-42	2230 ± -40	- 24.6	2240 ± -40	BC 390 (360) 190	Early Incised
160086	16420	B: A7-8/ B7-8	24-30	2220±-40	- 26.9	2190 ± -40	BC 380 (340, 320, 210) 160	Unusual sherds
160084	16361	A8-9/B8-9	54-60	2200±-40	- 26.3	2180 ± -40	BC 370 (200) 110	Hearth
155350	16367	A10-11/B10-11	24-30	1920±-40	- 24.8	1920 ± -40	AD 10 (80) 150	Balabio
160085	16401	A: A5-6/B5-6	24-30	1790±-40	- 26.9	1760 ± -40	AD 150 (250) 390	House mound
155349	16366	A10-11/B10-11	12-18	470 ± -50	-26.7	440 ± -50	AD 1410 (1440) 1520/1590-1620	Oundjo
WKO014 Podtanean								
155355	15661	C2-3/D2-3	54-60	2510 ± -40	- 24.7	2510 ± -40	BC 790 (770) 500/460-430	Early Podtanean
155353	15659	C2-3/D2-3	30-36	2140 ± -40	-25.1	2140 ± -40	BC 360-290/230 (180) 50	Balabio
155354	15654	C1-2/D1-2	42-48	2110 ± -50	- 24.9	2110 ± -50	BC 350-300/220 (160) 10	Late Podtanean
160087	15649	C1-2/D1-2	24-30	2010 ± -40	-24.2	2020 ± -40	BC 110 (30) AD 70	Balabio
155352	15652	C1-2/D1-2	18-24	1220 ± -40	-25.1	1220 ± -40	AD 690 (790) 900	Balabio-Oundjo
WPT020 Anse Longue								
160093	15349	W1-X1/B21-23	24-30	1850 ± -40	-25.7	1840 ± -40	AD 80 (150) 250	Plum
155363	15025	B22-23	18-24	1660 ± -40	25.6	1650 ± -40	AD 330 (410) 460/480-520	Plum
160092	15348	W1-X1/ B21-23	18-24	1120 ± -40	25.4	1110 ± -40	AD 870 (960) 1010	Plum-Ner
WKO026 Oundjo								
155356	15060	B: B14-15	30-36	630 ± -40	-24.7	630 ± -40	AD 1290 (1310,1370,1380) 1410	Oundjo
ECA044 Nöwé								
155357	16271	B: A2-3/B2-3	30-36	70 ± -40	22.8	110 ± -40	AD 1670-1950	Mixed
EHI050 Dowalwoué								
155359	16237	A1-2/B1-2	78-84	1830 ± -40	-25.6	1820 ± -40	AD 100 (220) 260/290-320	Marsh
160089	16468	A11-12/B11-12	66-72	1740 ± -40	26.7	1740 ± -40	AD 240 (350) 420	Balabio
155358	16445	A7-8/B7-8	18-24	930 ± -40	26.4	910 ± -40	AD 1020 (1160) 1220	Oundjo
EHI051 Tiouandé								
160091	16515	A1-2/B1-2	18-24	1610 ± -40	- 24.3	1620 ± -40	AD 370 (420) 540	Balabio
155362	16517	A1-2/B1-2	30-36	1380 ± -50	- 26.1	1360 ± -50	AD 620 (660) 770	Early incised
155361	16516	A1-2/B1-2	24-30	1060 ± -40	- 26.2	1040 ± -40	AD 910-920/960 (1000) 1030	Balabio
155360	16514	A1-2/B1-2	12-18	980 ± -40	- 24.7	980 ± -40	AD 990 (1030) 1160	Oundjo
160090	16513	A1-2/B1-2	6-12	250 ± -40	- 26.4	230 ± -40	AD 1530-1550, 1630 (1660) 1680, 1740-1810, 1930-1950	Oundjo

*: Calibration database: INTCAL 98 Radiocarbon Age Calibration (Stuiver M. *et al.*, 1998).

TABLE 2. Results of radiocarbon dating.

static out-curved rim typology during the first phase of occupation of the site, with paddle-impressed sherds representing the major component of the pottery production. During the late phase, paddle marks appear wider and new types of incised and impressed decorations appear. This is shown by the dating of a layer bearing incised ware at B.C. 390-190 (Beta-155351) in Site EPE006 at Baye. The end of the production of paddle-impressed pots at site WKO014 has been calibrated to B.C. 350-10 (Beta-155354), a result a few centuries earlier than the dating conducted on the same horizon after the 1952 excavations. For this region of the west coast of Grande Terre, we now have a reasonable indication of the disappearance of the Podtanean tradition more than 2000 years ago, a date well in line with what has been identified in the neighbouring site of Pindaï (Sand 1996c). These results show regional variations for the end-date for this ceramic tradition, as it appears to last longer on the east coast of Grande Terre (Sand 1998, 2001). During this late part of the Koné period, the back part of the dune system

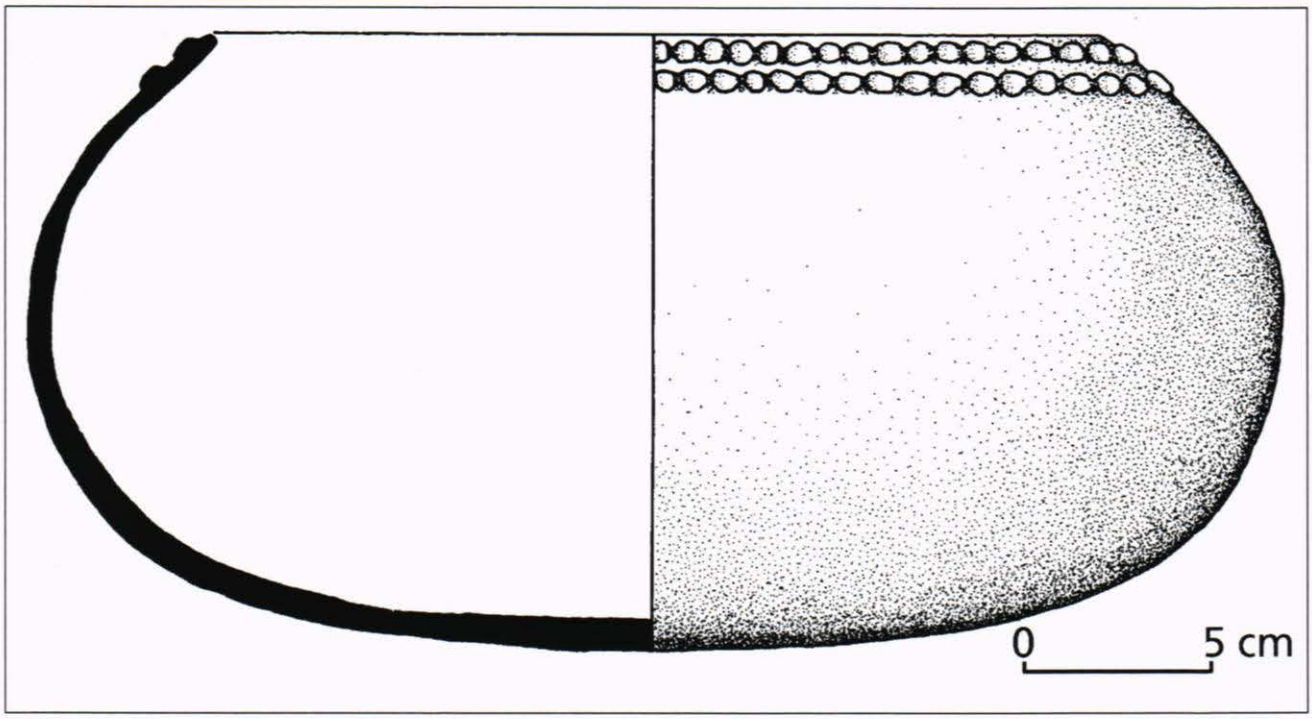

FIGURE 5. Tentative reconstruction of a Balabio tradition pot from site EPE006 of Baye (PAHMA Cat. No. 26742).

of site EPE006 at Baye stabilises, with an *in situ* hearth dated B.C. 370-110 (Beta-160084).

The Missing Link: The Balabio Tradition Defined

In the ceramic chronology of northern New Caledonia, the early Koné period ends with the disappearance of Podtanean. This leads to the start of the later Oundjo period, whose first part, during the first millennium A.D., is characterised by what J-C. Galipaud termed the Balabio tradition. Unfortunately, this ceramic tradition has never been thoroughly described or illustrated by Galipaud (1988, 1992), leading to a less than complete characterisation of one-third of the region's ceramic chronology. The data recorded from sites WKO014 of Podtanean, EPE006 of Baye, and EHI050 and EHI051 of Tiouandé, have greatly expanded our understanding of this middle tradition, confirming data obtained recently on new sites excavated at Tiouandé (Sand 2001). Typologically, the main pottery produced during the first millennium A.D. was of ovoid form, with reconstructed rim diameters ranking from 15cm to 25cm and maximum diameter ranking from 30cm to 45cm (Figure 5). Rim profile in the majority of cases is incurved, with in some cases a small thickening of the lip. Sherds are mostly clear-brown to light orange in colour, with fine tempers of different types. Decoration is scarce, restricted to the upper part of the pot and comprised of incising and some impressing during the earlier part of the sequence, with a few cases of applied relief during the later part. These relief decorations are composed of clay bands added to the outer surface and regularly flattened out, forming a wavy pattern. Finally, the presence of handles and raised nubbins has to be noted. So, somewhat contrary to the description given by Galipaud of the pots showing a real continuity in form with the preceding outcurved-rim Podtanean tradition and later Hienghène type of pots (Galipaud 1988:163-164), the Balabio tradition has a very distinctive typology, mainly characterised by incurved-rim pots with new sets of decorations. Also of note is that the claim of regular occurrence of holes in the upper part of the pots has not been demonstrated among the different collections studied, and might only be a particularity of the extreme north of the Grande Terre.

The first appearance of the Balabio tradition is difficult to date, as it seems to evolve from the late first millennium B.C. incised ware. Results obtained from recently excavated sites (Sand 1996c, 2001), as well as the early dates from site WKO014 of Podtanean calibrated to 360-50 B.C. (Beta-155353) and B.C. 110-A.D. 70 (Beta-160087) and from site EPE006 of Baye calibrated at A.D. 10-150 (Beta-155350), place the start of this kind of pottery securely to just over 2000 years ago. At site EHI050, the lowest, marshy layer, is calibrated to A.D. 100-320 (Beta-155359), and the layer over it, with

incurved rims and thin sherds, is calibrated to A.D. 240-420 (Beta-160089).

This tradition is present in site EHI051, in a layer calibrated to A.D. 370-540 (Beta-160091). Occurrence of in-curved rims further above, shows the persistence of this tradition during the second part of the first millennium A.D.. What is probably the most significant change observable for this late phase of occupation at site WKO014, is the evolution in rim form, with a progressive change from a classic Balabio tradition incurved rim to an outcurved rim, although the thickness and the fine compositional fill of the sherds remain the same.

Dating the Oundjo Tradition

The last ceramic tradition of the northern Grande Terre, named Oundjo, is the best known, as it continued in some regions up to the beginning of the 20th century. Oundjo pots are mostly of oval form with out-curved rims and incised, impressed or relief decorations, with diameters ranging from 25cm to sometimes over 50cm (Sand 1996b). Numerous complete pots are stored in museums and private collections worldwide, and sherds of broken Oundjo pots are, not surprisingly, the most numerous found in surface collections. Nonetheless, the chronology of this latest part of the ceramic history is scarcely known. In Gifford and Shutler's collection, the transition between Balabio and Oundjo was never abrupt in the material, but demonstrated by a progressive coarsening and thickening of the sherds, with the appearance of out-curved rims. More significant was often a change in stratigraphy, as if the start of the Oundjo tradition also marked a change in the use of the sites. In the sites where Gifford and Shutler's dates have been duplicated, they have returned more recent results.

The first phase of development of the Oundjo tradition is positioned at the end of the first millennium A.D., with a date calibrated to A.D. 690-900 (Beta-155352) for site WKO014 for a layer comprising Balabio as well as sherds typical of the more recent tradition, which might be intrusive. The lowest layers with Oundjo pottery have been calibrated in site EHI051 to A.D. 990-1160 (Beta-155360) and in site EHI050 to A.D. 1020-1220 (Beta-155358). In the eponymous site WKO026 of Oundjo, redating of a sample taken from the same depth as Gifford and Shutler in Location B, has given a calibrated date of A.D. 1290-1410 (Beta-155356), later than the result published in 1956. On site EPE006 of Baye, the layer containing only Oundjo-related sherds has been calibrated to A.D. 1410-1620 (Beta-155349). A progressive increase in incised, impressed and sometimes relief decoration can be noted towards the upper part of the layers enclosing these sherds. This is the case of an upper layer in site EHI051, with a median calibrated date of A.D. 1630-1680 (Beta-160090).

The dating or redating of nearly all sites where Gifford and Shutler excavated Oundjo tradition sherds, represents a tripling of available radiocarbon dates for this period, displaying great consistency in the results, confirming that this ceramic ware developed only during the last 900-800 years before first European contact. Preliminary observations of tempers, pastes and decorations show clear similarities between sites, and fine-scale analysis of the material should allow for a better characterisation of production centres and exchange networks present in the northern part of the Grande Terre, during this millennium characterised by the advent of the Kanak Cultural Complex (Sand 1995, 1996a).

The Naïa Period of Southern Grande Terre

Apart from a few paddle-impressed sherds found in a disturbed context during excavation of site SNA019 at Anse Vata (Gifford and Shutler 1956:73), the excavations conducted by Gifford and Shutler in 1952 on southern Grande Terre sites only exposed layers characteristic of the late part of the ceramic chronology, named the Naïa period for this region. Only one date for site WPT020 was published in 1956. Numerous subsequent excavations on similar sites have allowed a more precise chronology of this period (Sand and Ouetcho 1993; Sand 1995, 1996a; Galipaud 1997), and so only three new samples, all from site WPT020 of Anse Longue, were submitted for dating as part of our project. This site was partly reworked by recent garbage pits. The Plum layer has been calibrated to A.D. 80-250 (Beta-160093) and A.D. 330-520 (Beta-155363). The transitional Plum-Nera layer has been calibrated to A.D. 870-1010 (Beta-160092). These general results are well in line with what we know of the Naïa period chronology for the southern Grande Terre.

Unreliable Dates

As we anticipated from the beginning of this project, not all submitted samples would return satisfactory results. This is mainly the case with three sites, with samples coming from stratigraphic locations already identified as possibly problematic. The first are two dates from the lowest layers of site EHI051 in Tiouandé. Although the ceramic material studied from these testpits indicate a reliable chronological sequence, the small size of the sherds recovered and the nature of the site, positioned on a slope, pointed to possible slope wash disturbance. Significantly, although three samples taken from the upper layers have returned satisfactory dates, the lowest samples from Square A1-2/B1-2, linked to incurved rims of the Balabio tradition at 24-30 inches and to out-curved rims of

the late Koné period at 30-36 inches, returned far too recent dates calibrated respectively to A.D. 910-1030 (Beta-155361) and A.D. 620-770 (Beta-155362).

The layer under the house-mound, excavated in Location A of site EPE006 of Baye, containing a small amount of Oundjo tradition pottery, has been calibrated to A.D. 150-390 (Beta-160085). In Location B of the same site, a small number of unique coarse sherds with large-size temper, whose origin has not yet been determined, has been identified in level 24-30 inches, and dated to B.C. 380-160 (Beta-160086). Finds of similar types of sherds has been made in the undated 60-66 inch level of excavations at EHI050 and in recently excavated rockshelters of Tiouandé (Sand 2001), which unquestionably dates to the first millennium A.D.. These two results from Baye are however clearly too early, and might be related to mixing and redeposition of charcoal in the unstable front part of the seashore dune system.

A somewhat different pattern applies to site ECA044 of Nôwé in Canala. During the excavations, an alluvial deposit at 30-36 inches had been identified in Location B, which contained one rolled paddle-impressed sherd, related to the Podtanean tradition. The dating of a sample from this level returned a calibrated result of A.D. 1670-1950 (Beta-155357), pointing to a possible recent formation of the Location B river bank at this site, and the mixing of old ceramic material in washed-out layers.

Finally, sample CSNC185, selected from site WKO014 of Podtanean to date a paddle-impressed layer at 48-54 inches, was discarded, as being mostly formed by burned clay, identified as "mostly mineral with a bit of charred organics in it" (R. Hatfield pers. com. 2001), and having too little carbon for any result.

CONCLUSIONS

Our restudy program conducted on the archaeological collection excavated 50 years ago by E. Gifford and R. Shutler Jr. in New Caledonia, has revealed much new information on the prehistory of the archipelago. The renewed recording of the ceramic types, the reconstruction of the stratigraphies and the dating by AMS C14 of 24 new charcoal samples, has greatly expanded our knowledge of the content of those sites. Equally important, this program has shown the amount of scientific data still present in such long-ago excavated archaeological collections, provided detailed proveniences of the materials are retained in the catalogue records, and the artefacts are adequately curated by the institutions hosting these collections. The hand cataloguing of some 16900 individual entries completed by Gifford and his assistants in 1953-54, would probably not be done by anyone today! But a modern computer database of recording of present-day excavations should allow in 50 years time the same restudy of our site collections if necessary. What might seem today of little interest, as scattered charcoal might have been to Gifford in his excavations, can become central to archaeological studies in the future. We can only guess what major contribution this collection would have allowed in the understanding of shellfish gathering over New Caledonia's prehistory, if all the shellfish remains had been conserved.

Reanalysis of Gifford and Shutler's collection has not only significance for a better understanding of the ceramic chronology of New Caledonia, it also has a meaning in a wider, regional perspective. The 1952 scientific expedition is intimately related to the first excavation at Lapita, and to the first identification of a regional ceramic type which had been found from Watom to New Caledonia and across to Tonga. Gifford and Shutler pioneered the use of C14 in the Western Pacific to date their sites, and the confirmation by modern AMS techniques of the validity of most of their results is a clear indication of the robustness of the method from the very beginning. They were also instrumental in proposing a set of regional post-Lapita ceramic changes and relationships, specifically between New Caledonia, Vanuatu, and Fiji (Gifford and Shutler 1956:93-95). Although recent studies have challenged any typological links between the chronologies of southern and eastern Melanesian archipelagos (Bedford 2000; Bedford and Clark 2001), there remains a set of striking features that need deeper consideration, in terms of typological forms as well as decorative techniques and motifs. Fifty years ago, Gifford and Shutler showed the way towards a proper scientific analysis of Melanesian prehistory, by concentrating on their data and avoiding the then-current speculations of successive human groups introducing, at different times, different "cultures". Succeeding studies have shown how much Pacific societies have been dynamic agents of their history, as well as identifying archaeologically long-scale exchanges in goods and arrival of newcomers during prehistoric times. Edwin Gifford probably never imagined the tools we have today to reconstruct the Pacific's past, but the very detailed recordings of the New Caledonia finds he has left behind are a unique testimony to meticulous archaeological work.

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