

NEW CALEDONIA: SOME RECENT ARCHAEOLOGICAL PERSPECTIVES

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New Caledonia occupies a privileged position at the southern end of the Melanesian island arc. This position has enabled it to develop its own culture over the millennia, partly influenced by contacts from the north as well as the east.

Research carried out on the mainland of New Caledonia over the last 15 years or so has enabled us to identify the major stages of settlement on the island and the processes of cultural development. Nevertheless, a number of points continue to be disputed, especially as the inventory of archaeological sites has not yet been completed and the recent discovery of several more sites of the Koné period (3500 to 1800 B.P.) indicates that there could still be surprises in store.

The aim of this paper is not to draw an overall picture of the prehistory but rather to discuss the circumstances surrounding initial settlement and the cultural developments that subsequently occurred, both in New Caledonia and in neighbouring countries in Melanesia. As two pottery traditions occur at nearly the same time early in the chronology, the question of their relation to each other and the cultural significance of their common appearance has been an important matter of debate for many years (Frimigacci 1981, Green and Mitchell 1983, Galipaud 1988, 1990b, 1992). This question will be further discussed here.

In a later section, I shall review the changes and developments that occurred just before the disappearance of Lapita pottery. The most significant dates of this period and information relating to the main sites are contained in Tables 1 and 2.

LAPITA SITES

Lapita sites were described early in the history of New Caledonia (Piroutet 1917) and recognised as such quite early on (Lenormand 1948, Avias 1949, Gifford and Shutler 1956, Golson 1959-62). Most of the known sites were surveyed or excavated in the 1970s and 1980s by Jean-Pierre Maitre and Daniel Frimigacci. Unfortunately, the scarcity of published information, partly filled by the important review published by Green and Mitchell in 1983, still makes it difficult to evaluate the full potential of those archaeological sites. I have used the knowledge I gathered while surveying and excavating in New Caledonia during the last ten years and information kindly provided by Daniel Frimigacci to compile this summary.

Table 1 shows the major known Lapita sites, some of which have been excavated. Only sites with a significant number of dentate-stamped sherds (more than 20) have been included. Several sites attributed to the Lapita period by one author or another have been rejected because of the lack of even minimal evidence or the poverty of the artefactual assemblage. This does not necessarily imply that these sites have been wrongly attribute to the Lapita period, but only that they do not match the classical Lapita sites of New Caledonia and thus might represent a different feature of this period.

There are now eight important sites with Lapita pottery. They are located on the west and north coasts of the main island, in the Loyalty group and, of course, on the Ile des Pins. Sites formerly considered to be Lapita include those of Ilot Vert and Podtanéan where only single fragments of Lapita pottery have been discovered. The Naïa site presents a problem in that there is now no trace of the Lapita fragments that were presumed to have originated there or from neighbouring bays. It is clear that Smart found no Lapita pottery apart from two sherds with a possible dentate design (Smart private correspondence 11/07/1966 to Jack Golson, ANU Canberra) and that he did not assign the Naïa sites to the Lapita tradition. Similarly, it has now been established that some of the fragments which Frimigacci believed were from the Naïa site (Frimigacci 1975: Plate 1), in fact originated from the Vatcha site on Ile des Pins (E. Kasarhérou, pers. comm.). Sand and Ouétcho (1993) recently claimed that Naïa and Ongwé were to be considered as Lapita, because of the discovery of a few dentate-stamped sherds in the area. This recent discovery follows the above stated finds by Smart and perhaps by Frimigacci. Together they certainly suggest that this area was occupied during the Lapita period and that the Lapita influence was also present here, but the scarcity of dentate designs means that Naïa or Ongwé cannot be put in the same class as Koumac or Vatcha.



TABLE 1
Sites of the Koné Period, New Caledonia

Name of site	Geographical setting	Environment	Fresh water	Area (exc. area)	Levels	Structures	Pottery	Other artefacts	Dates
PAIROME	Belep, south of Art Island	coastal, coconut plantation sheltered from west winds, ultrabasic rock formation	yes				Podtanéan		
ARAMA NBL 098	Arama village, NE coast, New Caledonia	coastal, fringing reef, mangrove	yes	3 ha (25 m ²)	disturbed site	burial ditches	Lapita Oundjo		
BALABIO NBL 002	island, NE coast of New Caledonia	coastal	no	2 ha (7 m ²)	2	pit burial, earth oven	Oundjo	stone flakes	
BALABIO NBL 003	island, NE coast close to NBL 002	coastal flat, creek coconut plantation	yes	300 m ²		earth oven pit burials	Podtanéan	quartz flakes	
KOUMAC NKM 001	village, NW coast of New Caledonia	coastal flat fringing reef, mangrove open to south	yes	7.5 ha (120 m ²)	3	drainage ditches, stone structures	Podtanéan Lapita Oundjo	adzes shell ornaments fish hooks	2515±130 UW-364 to 1740±85 UW-361 (see Table 2)
BONDE	village, north New Caledonia, Paimboa range, altitude 800 m	savana along the Diahot river	yes	500 m ²			Podtanéan Oundjo		
KONÉ WKO 013 WKO 013a	west coast of New Caledonia Koné Village	coastal flat, swamp and peninsula	no	1.2 ha (12 m ²) (+4 m ²)	2 to 3	pit burial	Lapita Podtanéan Oundjo	stone flakes shell ornaments 2 Lapita pots	2800±350 M-341 2435±350 M-336
PODTANÉAN WKO 014	same as WKO 013 Foué peninsula, 1.5 km from 13a	coastal, dry creek	no	1.2 ha 7 m ²	disturbed		Podtanéan Lapita ?		1700±300 M-333
WKO 142	Koné plain, 7 km inland from WKO 013	hill, secondary forest	yes				Podtanéan		

BOURAIL WBR 001	village, mouth of Nessadiou river, west coast	coastal flat mangrove bay open to south	yes	560 m ² (19 m ²)	3	house posts pits	Lapita Podtanéan Naïa	adzes stone flakes shell ornaments	2875±115 UW-471 to 1780±100 UW-472 (see Table 2)
ILOT VERT WBR 008	islet facing Nessadiou	reef	no	9 ha (42 m ²)	2 to 3	coral walls and structures burial	Podtanéan Naïa	stone flakes adzes	2435±40 UW-767 2230±150 ANU-4927
NAIA TON 6 TON 7 NOU 1	west coast, near Païta village	coastal, bay oriented to SW south-west, swamp	no	150 m ² 170 m ²	6 2 1	house posts pit burials stone oven	Podtanéan Naïa	stone flakes adzes shell ornaments	1745±117 ANU-98 3165±180 ANU-96 2065±110 ANU-97 2855±95 ANU-259
ONGWE WPT 148	west coast, bay north of Naïa	same as Naïa	no	200 m ² (6 m ²)	3	house posts	Podtanéan	adzes, worked shell, stone flakes	
NOUMEA SNA 019	Anse Vata bay	coastal, mangrove oriented to SW	yes	160 m ²		burial	Lapita Podtanéan	shell ornaments stone flakes	
CAP BOCAGE EHU 188	peninsula, north of Houailou, east coast	shelter behind coastal reef flat, ultramafic rocks	yes	30 m ² (5.5 m ²)	4		Podtanéan Naïa	shell ornaments rock art	
TIWI SGO 020	south point of Grande-Terre	shelter near coast oriented to east	yes	100 m ² (15 m ²)	12	earth oven	Naïa Podtanéan	shell ornaments bone tools stone flakes	3240±220 B-44650 2220±160 B-47955
VATCHA KVO 003	Ile des Pins, Vao village	coastal plain, fringing reef	no	500 m ² (120 m ²)	4	earth oven	Lapita Podtanéan	shell ornaments stone flakes	2855±165 ANU-262
PATHO LMA 020	Patho village, east coast, Maré, Loyalty Islands	coastal plain, coconut plantation, sand dune	no	along 7 km (27 m ²)	1	earth oven	Lapita	shell ornaments adzes	2590±110 ANU-6616 2500±90 B-50604
LUECILLA LLI 002	Luecilla, east coast, Lifou, Loyalty Islands	coastal plain, coconut plantation	no	along 3 km			Lapita Podtanéan		

In the Loyalty Islands, the Patho site at Maré, discovered in 1987, is situated between the Kurin and Padewia sites explored by Frimigacci and Dubois. Recent work in the area (Galipaud and Semah 1992) shows that there are indications of Lapita presence all along the coast, from Kurin to Patho, i.e., over a distance of some 7 km. I have therefore given only one site number to this area for the time being. Further excavations might indicate subdivisions.

In Lifou, I found a similar Lapita presence along Luecilla Bay. More recent surveys have shown that other Lapita settlements may exist elsewhere in the same area (C. Sand, pers. comm.).

Because of recent discoveries, the previous map of Lapita settlement in New Caledonia drawn by Frimigacci (1980) has to be revised. Newly discovered sites do not always conform to the previously assumed locational criteria for Lapita settlements (Frimigacci 1980). In particular it should be noted that the west coast is no longer the only location of Lapita sites, although most sites do still occur there. There are no swamps or fresh water in the Loyalty Islands and no reef passage in Arama. However, a new common denominator emerges among these sites: they are all exposed to the trade winds and sheltered from gales.

The Lapita-bearing horizons are found on fossil beaches formed during the warmer period which followed the last marine transgression and is dated in New Caledonia to about 3200 B.P. At that time, relative sea level on the western coast was 1 m above present. It dropped to -0.5 m around 2900 B.P., and then rose gradually to its current level (Baltzer 1970, 1982:23-32). These fluctuations in relative sea level are difficult to determine precisely at the local level, but they probably had a fairly significant influence on the initial selection of sites for occupation and, subsequently, on their preservation.

The lack of coastal plains and the local tectonic events that have affected the eastern coast at a relatively recent period (Cabioch *et al.* 1989) help to explain why no prehistoric sites have been found there. Settlement options on the east coast were severely limited and evidence of old occupation could well have been washed away by later natural events. The discovery in 1987 of several paddle-impressed sherds at the back of a bay in the Goro area, not very far from the Tiwi Rockshelter, suggests that remains of this occupation might be preserved under layers eroded from the slopes.

The Patho site on Maré Island is the only well preserved Lapita deposit, apart perhaps from Nessadiou, for which information is scarce. The Patho site is separated from the sea by an offshore sand bar several metres high, which appears to have been formed after the abandonment of the site. This bar has sheltered the site from later wave action and damage.

All Lapita sites (with the exception of Arama) include Podtanéan pottery in the lower levels in direct association with Lapita pottery. Podtanéan pottery is also found in places next to Lapita sites and in neighbouring areas. It is thus difficult to study Lapita settlement patterns and strategies in New Caledonia without taking into account the Podtanéan factor.

PODTANÉAN SITES

Many more sites are marked by Podtanéan pottery than by Lapita and they are found throughout New Caledonia. They follow the same pattern of distribution as the Lapita sites, i.e., they are numerous along the western coast, especially on the smaller islands (Konième, Ilot Vert, Ilot Bailly), and occur less frequently on the eastern coast. The only well preserved sites are those in rockshelters (Cap Bocage, Tiwi). The only island where no Podtanéan site is yet known is Ouvea.

There is one major difference between Podtanéan and Lapita site distributions. Whereas no trace of Lapita has ever been found beyond the coastal zone, at least two Podtanéan sites have been identified in small inland valleys. These are the Bondé site and the WKO 142 site at Koné. Although no dates are available for either of these sites, the pottery samples collected clearly belong to the Koné phase. The distribution of Podtanéan style pottery shows that settlement strategies during the initial phase of colonisation of New Caledonia were more complex than was previously assumed.

Because similar pottery is found in Fiji, Wallis and New Caledonia, a regional origin has often been proposed for paddle-impressed pottery. This does not take into account the wide distribution of paddle-impressed ware in most of Southeast Asia and South China well before its appearance in Remote Oceania. Although information about its possible occurrence in Near Oceania is still scarce, it could be assumed that this pottery style had its origin in Southeast Asia rather than in Remote Oceania. Paddle impressions are often difficult to recognise and are sometimes attributed to the fabrication process rather than to a decorative technique. The occurrence of paddle-impressed pottery in Near Oceania is already attested in the Choiseul area at a somewhat later period and will certainly be further documented elsewhere in the region, as the focus on plain or poorly decorated wares increases. One of the implications is that if the origin of paddle-impressed decorated ware is somewhere to the north, it should be possible to trace its distribution from its point origin to New Caledonia. The lack of paddle impression in Vanuatu and its abundance in Fiji and Futuna might suggest that its initial dispersal was through the Solomons and towards Western Polynesia before reaching back to New Caledonia rather than through Vanuatu. However, its seemingly late appearance in Fiji contradicts this view.

TABLE 2
Radiocarbon dates for sites of the Koné Period

Lab. No	CRA	Calibrated Age Range BP (2 sigma)	Site No	Sample Context
Beta-44650	3240±220	4072 (3468) 2881	SGO 020	Tiwi, Level 14, loc. 1
ANU-96	3165±180	3829 (3385) 2887	WPT 055	(Ton 7), Naïa, base of Level 1
UW-471	2875±115	3359 (2989) 2759	WBR 001	Nessadiou, Level 3
ANU-262	2855±165	3399 (2961) 2710	PIN 1	Level 4 (Smart, n.d.)
ANU-259	2855±95	3322 (2961) 2769	WPT 056	(NOU 1) Naïa, oven
UW-652	2830±50	3104 (2947) 2849	WBR 001	Nessadiou, Location D
M-341	2800±350	3826 (2925-2914- 2882) 2065	WKO 013	Lapita sq. C1-2, D1-2
UW-647	2790±120	3259 (2875) 2739	WBR 001	Nessadiou, Loc. F, base
UW-654	2790±60	3049 (2875) 2769	WBR 001	Nessadiou, Loc. D, base
UW-653	2760±60	2999 (2859) 2759	WBR 001	Nessadiou, Loc. E, base
UW-648	2710±50	2937 (2792) 2749	WBR 001	Nessadiou, Loc. G, base
ANU-4928	2610±580	4148 (1752) 1340	WBR 009	Ilot Vert, Loc. E, base
UW-651	2600±55	2730 (2750) 2516	WBR 001	Nessadiou, Loc. E, base
ANU-6616	2590±110	2935 (2748) 2349	LMA 020	Patho, oven
UW-364	2515±130	2869 (2717) 2329	NKM 001	Koumac, Loc. A, niveau 3
Beta-50604	2500±90	2779 (2714-2622- 2616-2562- 2557) 2349	LMA 020	Patho, oven
M-336	2435±350	3369 (2468) 1626	WKO 013	Lapita, base
UW-767	2435±40	2718 (2468) 2350	WBR 009	Ilot Vert, Loc. A, base
ANU-4927	2230±150	2729 (2315-2225- 2213) 1880	WBR 009	Ilot Vert, Loc. K, sq. B1
Beta-47955	2220±160	2739 (2311-2231- 2207) 1860	SGO 020	Tiwi, Level 13, Loc. 1
UW-362	2190±110	2359 (2297-2265- 2156) 1930	NKM 001	Koumac, Loc. E, Level 2
UW-747	2140±50	2319 (2135) 1999	NKM 001	Koumac, Loc. F, Level D
UW-359	2070±110	2339 (2050) 1820	NKM 001	Koumac, Loc. E, Level 3
ANU-97	2065±110	2339 (2047) 1810	WPT 055	(TON 7), Naïa, Level II+
UW-746	2020±45	2110 (1985) 1877	NKM 001	Koumac, Loc. F, Level B
UW-748	2020±140	2339 (1985) 1629	NKM 001	Koumac, Loc. G, sq. D1
M-340	1880±350	2749 (1832) 1070	EHI 050	(site 50), Dowalwoué
ANU-4920	1880±190	2329 (1832) 1390	NAR 098	Arama, Loc. 5, (-0.55 cm)
UW-358	1870±70	1979 (1827) 1621)	NKM 001	Koumac, Loc. E, Level 2
ANU-4926	1830±160	2139 (1804-1786- 1760) 1400	NBL 002	Balabio, Loc. A, Level 2
UW-558	1830±55	1890 (1804-1786- 1760) 1616	NKM 001	Koumac, Loc. A, sq. G2
UW-559	1810±230	2329 (1729) 1290	NKM 001	Koumac, Loc. A, Level 2
UW-553	1785±430	2759 (1714) 798	NKM 001	Koumac, Loc. A, Level 3
UW-472	1780±100	1940 (1711) 1510	WBR 001	Nessadiou, Loc. A, Level 2
ANU-98	1745±117	1940 (1695-1650- 1632) 1400	WPT 055	(TON 6), Naïa, base Level 1
UW-361	1740±85	1870 (1693-1654- 1629) 1500	NKM 001	Koumac, Loc. E, Level 2
M-333	1700±300	2339 (1607) 990	WKO 014	Podtanéan, base

THE CHRONOLOGICAL FRAMEWORK

The dates obtained for sites of the Koné phase span the period from about 3400 to 1700 B.P.¹

An indication of the age of initial human occupation in New Caledonia is given by the dates for level 14 at Tiwi (3240±220 B.P., BETA-44650) and for layer I of site TON 7 at Naïa (3165±180 B.P., ANU-96). These two dates come from different depositional contexts in the southern part of the main island. They date layers associated with an occupation lacking Lapita pottery, but including Podtanéan paddle-impressed ware. The size of the two sites and the number of sherds suggest that the dates reflect an already well established population rather than the faint tracks of a founding settlement. Earlier dates are still possible, as level 15 at Tiwi, where Podtanéan pottery still occurred, has not yet been dated.

The earliest date for pottery in New Caledonia does not exclude the possibility of earlier settlements, but at this stage the evidence is inconclusive. As most of the early levels described, apart perhaps from Tiwi levels 14 and 15, are in well settled sites, traces of an earlier founding population might still be discovered but should not, in my view, be more than a few more hundred years older. Work being carried out on the palynology of swamps on the south-west coast (Semah pers. comm.) as well as new analysis of material from the tumuli (Frimigacci and Golson pers. comm., Golson, this volume) may help to resolve the question of dating the early settlements over the next few years.

It should be noted that the known dating of this initial occupation corresponds to the end of the marine transgression process during which the maximum relative sea level on the west coast is estimated to have been 1 m above current levels (Baltzer 1970, 1982, Cabioch *et al.* 1989). Earlier coastal settlements would have been buried below sea level or destroyed. One could thus expect to find evidence of early settlements at the back of bays, under deposits resulting from erosion on the slopes, rather than along the coast, where it would have disappeared.

The dating of the main Lapita sites appears to indicate that the earlier settlements are situated in the southern part of the island, at Vatcha, Nouméa and Bourail. The dates for Koumac and Koné are surprisingly recent. The two dates from the Patho site are consistent with dates obtained from the northern part of the island. This suggests that initial settlement took place in the south rather than the north. This assumption has further implications for the origin and direction of the first settlement. They are discussed below.

The end of the Koné period is much more difficult to date accurately. The most recent dates come from sites at Bourail-Nessadiou and Koumac. In these two sites, however, the presence of some Lapita sherds in the upper levels might be due to later gardening activities rather than primary deposition. Already at this period there are sites with other forms of pottery (1745±117 B.P., ANU-98, for pottery with handles at the base of level I, site TON 6, Naïa Bay and 1830±160 B.P., ANU-4926, for pottery of early Oundjo style in level 2 of site NBL 002, Balabio Island.) The fact that no trace of either classic Lapita or Podtanéan pottery has been found in these two sites suggests that at the beginning of the first millennium A.D., new cultural influences were developing in the north as well as the south of New Caledonia. The question of whether Lapita pottery was still in use in some places at this time is difficult to answer. The accuracy with which pottery can provide testimony of human behaviour and social changes is a factor which has to be taken into account. Pottery might still be kept aside or collected in the village as a curiosity some time after its disappearance from the economic scene and therefore, an uncertainty of 100 to 150 years is not surprising. I have the feeling that the Koné period ended very early in the 1st century A.D., if not even before, but in the lack of any objective proof it is reasonable, given the radiocarbon results cited above, to place it during the 2nd century A.D.

PODTANÉAN AND LAPITA

The situation in New Caledonia, where Lapita and Podtanéan pottery are contemporary, bears little resemblance to what is generally known elsewhere in Melanesia and Western Polynesia. Paddle-impressed ware is known to occur in Fiji and Wallis in relatively early contexts, but its relation to Lapita in these islands is not clear and paddle impressions are generally considered to follow Lapita in the chronology (Hunt 1980, Davidson *et al.* 1990, Sand 1992). The occurrence of both forms of pottery under identical circumstances at the beginning of the Koné period, and the somewhat wider distribution and larger number of Podtanéan sites, compared with Lapita sites, raise the question of the relationship between the respective producers of these forms of pottery.

According to Frimigacci (1981), the paddle-impressed ceramics are primarily the trade-mark of a specific technique that was imported into New Caledonia by Lapita artisans. This technique would then have been taken up by other groups, to become a tradition in its own right. According to Green and Mitchell (1983:42),

this contemporary technique, quite distinct from Lapita techniques, should be considered in a category of its own. To illustrate the difference, they suggest calling it Podtanéan, after the site of that name (WKO 014) at Koné, close to the site of Lapita on the Foué Peninsula.

I opted to retain this name to typify this pottery technique, not because I necessarily support Green's theory, but because the location of the Podtanéan site is a good example of the spatial relationship that prevailed between Lapita and paddle-impressed pottery during the Koné period: paddle impressions being always intermixed with Lapita in Lapita sites as well as being present without Lapita some distance away.

By analysing the physico-chemical components of the two ceramic styles, I have endeavoured to understand the implications of the occurrence of two pottery types within the same cultural context (Galipaud 1988, 1990a, 1990b). Mineralogical analysis has shown that in the sites in the northern region of New Caledonia these two types of pottery were of similar composition, often indeed indistinguishable, and characterised by unusual minerals such as spinel. The fairly similar composition of Lapita and Podtanéan pottery is confirmed, again in the northern region, by the analysis of the clays. The results of the analysis of heavy minerals in the clay showed that a very specific mineral, namely glaucophane, was present in the samples. This type of mineral originates from high pressure metamorphism and only occurs along a very thin strip parallel to the Diahot River (Paris 1981:181). Analysis of some clay samples taken from the Koumac and Koné Rivers established that glaucophane does not occur in the clay deposits of this area. The occurrence of spinel and glaucophane in both Lapita and Podtanéan pottery shows not only that the two pottery types were made with similar clays and temper, but also that the Koné potters had a good knowledge of their environment, whether coastal or not.

These analyses suggest, furthermore, the following considerations:

- a) Pottery sherds of the Koné period found in the northern sites were manufactured in the north. The unique clay and temper used might indicate a specialised place of production for the entire region. It is also likely that some pottery found on other sites originated in the north. This is indicated, for example, by the presence of spinel at Patho in the Loyalty Islands.
- b) Coral temper is certainly not the most abundant tempering material in this period. In view of the existing dates for these sites, coral tempering may well have been the basic technique used at the beginning, when only coastal resources were known, but it was replaced by other minerals that produced better quality wares as soon as inland resources were discovered.
- c) Whilst the Lapita and Podtanéan wares may be different from a morphological or stylistic point of view, they have one very specific pottery clay in common. It is unlikely to be due to technology transfer. In some of the more representative samples, one could even assume that both forms of pottery were made from the same source of clay, perhaps by the same people.

These observations strongly suggest that both pottery types belong to a single cultural tradition. The question then is what could have been the role of each within the society. The differences between Lapita and Podtanéan are striking: Lapita vessels are of complex shape and form, carefully produced and elaborately decorated with conventionalised designs. On the other hand, Podtanéan pottery is of simple design, only sometimes carinated, and decorated with impressions that appear to owe more to the method of production than to any artistic bent. However, it is well fired and virtually water-proof, unlike the Lapita pottery, which is very porous.

Given these characteristics, a hypothesis can be formulated that the Lapita pottery represented all that was immutable, all that was sacred, whereas Podtanéan pottery had a less specific, utilitarian purpose. The number of Podtanéan sites would seem to support this theory. In this case, Lapita sites would not represent a settlement by a separate group, but the place where the symbol of a common cultural belief was accepted and shared by several communities. Lapita and Podtanéan settlements would then represent different patterns of a unique settlement, which could explain the common appearance of Lapita and Podtanéan in some places as well as the relative abundance of Podtanéan in many locations without the Lapita component. On this basis, it would be easier to explain the rapid development of Lapita pottery in New Caledonia and its seemingly equally rapid disappearance during the 1st to 2nd century A.D.

THE END OF LAPITA

In New Caledonia there is no real hiatus between the end of the Koné period and the ensuing Naïa and Oundjo periods except for the purely Lapita sites which seem to be abandoned after this period and do not show any sign of reoccupation before around 1000 B.P. However, a number of changes affected the island at the beginning of the Christian era. The most pertinent was undoubtedly the disappearance of Lapita pottery.

This could have occurred in the first century of this era, virtually at the same time as in other Melanesian and Western Polynesian islands. Podtanéan pottery seems to undergo some evolution (development of incised designs), which continued throughout the first part of the first millennium A.D. in the southern part of the island. In the northern part, however, paddle-impressed design disappeared soon after Lapita and continuity is not attested in sites.

The disappearance of Lapita seems to be associated with geo-climatic changes. This is particularly noticeable at the Koumac site, but also in other sites along the west coast, such as Naïa and Ongwé, or Tiwi on the southeast coast. In location F at Koumac, the archaeological layers D and B were dated respectively 2140 ± 50 B.P. (UW-747) and 2020 ± 45 B.P. (UW-746). In location E of the same site, layer III (or D) is dated 2070 ± 110 (UW-359) and layer II (or B) 1870 ± 70 B.P. (UW-358).

The deposition of a sterile layer of sand between the archaeological layers D and B (III and II in location E) was probably caused by a catastrophic event that led to the site being abandoned and then resettled some time later. The range provided by these dates suggests when this event occurred, possibly at the very end of the last millennium B.C. The layer B (or II) occupation was of short duration and might have ended as abruptly as layer D (or III) as a result of sand deposition on top of this layer. The site was then abandoned until the very recent period.

At the Naïa site, as at Ongwé, the base of the stratigraphy in the zone closest to the shore (site TON 6) contains layers of more recent date (1745 ± 117 B.P., ANU-98, for the base of level 1) whereas further back from the shore, older layers have been preserved immediately below the surface (2065 ± 110 B.P., ANU-97, for layer II+ in site TON 7). The lack of older deposits near the shore attests the natural events that affected the coast line at this period. TON 6 may represent resettlement of the area after the abandonment of TON 7.

Finally, at Tiwi, the basal layers consist of sediments eroded from the plateau. These deposits cease at the same time as the Podtanéan pottery disappears, to be replaced by marine sediments brought in by the wind, and many stones and rocks indicative of partial collapse of the shelter. These data, although still very sketchy, suggest that the end of the Koné period was marked by very unusual climatic conditions which, while they may not have caused the Koné culture to disappear, could well have required a rapid adaptation to a changing environment. The archaeological data suggest that the later occupation in New Caledonia saw a rapid extension of occupation towards the interior and the development of a more land oriented economy (Galipaud 1988). The changes in settlement locations as well as economy might be related to natural climatic and environmental variations.

CONCLUSIONS

In this paper I have tried to emphasise the main points about the first millennium of occupation in New Caledonia. While the proposed hypothesis might have further implications outside New Caledonia, I have limited the discussion to this island owing to the lack of detailed information from other islands where paddle-impressed pottery occurs together with Lapita pottery.

The appearance of a paddle-impressed ware in true association with Lapita does not add much to the story of the Lapita cultural complex except in expanding the list of artefacts associated with this complex. If, however, the origin of paddle-impressed wares in Remote Oceania can be traced back to their Southeast Asian equivalents, it might shed new light on the possible origin of the Lapita complex as well as on the colonisation trails.

NOTE

1. In this list I have not taken into account the date of 4010 ± 130 B.P. (Gak) for the older layer (IV) at Vatcha obtained from several shells of *Placostylus* sp. and deemed by Frimigacci himself (1981:115) to be unreliable. He suggests an age for this deposit of 1600 B.C., but gives no convincing grounds for this revision.

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