

Archaeology in Gabon, 1886–1988

BERNARD CLIST

Abstract

This is the first attempt at synthesis of archaeological research conducted in Gabon between 1982 and 1988. Middle Stone Age, Late Stone Age, Neolithic, Early and Late Iron Age data are discussed in the context of earlier discoveries and of current research in Central Africa as a whole.

Though the Middle Stone Age remains undated, its earliest component clearly preceded 40,000 bp. The Late Stone Age is dated *ca* 9000–2500 bp, with an early Neolithic perhaps as old as 5000–3000 bp. A late Neolithic is firmly dated to 2600–2200 bp. Iron smelting is shown to have begun *ca* 2500 bp in inland areas of Gabon and *ca* 2000 bp near the coast.

Résumé

On présente ici une première synthèse des données scientifiques obtenues au cours des travaux de 1982–1988 au Gabon. Les éléments relatifs au Middle Stone Age, au Late Stone Age, au Néolithique, aux Ages du Fer ancien et récent sont présentés. A chaque fois une discussion s'engage les mettant en relation avec le contexte global de l'Afrique Centrale ainsi qu'avec les découvertes antérieures.

Quoique le MSA reste mal daté, il peut être démontré que les plus vieux outils ont au moins 40,000 ans d'âge. Le LSA quant à lui est circonscrit à la période *ca* 9000–2500 bp, alors qu'un Néolithique ancien est peut-être situé vers 5000–3000 bp. Un Néolithique final est, lui, correctement daté vers 2600–2200 bp. Enfin, la fonte du fer est attestée à l'intérieur des terres dès 2500 bp alors que le littoral ne semble pas connaître cette technologie avant 2000 bp.

Introduction

Central Africa has been poorly studied by archaeologists. Though research there started early in the nineteenth century (Gabel 1985; Maret 1985a) modern archaeology, taking stock of the interactions between man and the environment by way of pluridisciplinary studies, started on a substantive scale only during the late 1960s.

In Gabon, artefacts have been found since 1886 (Hamy 1897), but it was only in 1961 that

serious research started. A few amateurs then made systematic surface collections of artefacts of various periods, with a special emphasis on the Libreville area. Later, in 1963, the Gabonese Society for Prehistoric and Protohistoric Research (SPPG) was founded. This led to the publication of bulletins, monographs (Farine 1963; Pommeret 1965a, 1966a) and communications at international meetings (Blankoff 1965, 1969). A few trial excavations were also made in the Libreville area and at Ndjolé inland, the first of their kind in Gabon.

In 1967 the SPPG was disbanded, and little of archaeological interest occurred until D. Cahen's visit to Libreville in 1977, which led to the first 14C date from the country (Cahen 1978a). Another gap then lasted a few years until some university scholars saw the importance of national and long-term archaeological work. This led to the establishment in 1981 of archaeology teaching and of an archaeology laboratory at Omar Bongo University. French and American archaeologists were associated with the small team of teaching staffed by L. Digombe, which has also carried out fieldwork (Schmidt *et al.* 1985; Digombe *et al.* 1987e).

In 1982 a project relating to the study of past interactions between man and environment was launched at the Ecole Normale Supérieure of Libreville. Following promising early results (Peyrot and Oslisly 1985, 1986, 1987) work was expanded to include excavation in 1985 and 1986 (Oslisly 1986).

In 1985 the International Centre for Bantu Civilizations (CICIBA), established in Libreville since 1983, launched its Archaeology Department under the supervision of the present writer. In 1985 and 1986 surveys and trial excavations were carried out (Clist 1987a, 1987b, 1987c; Clist *et al.* 1986). Later, in 1987 and 1988, large scale excavations were undertaken, based on the earlier results (Clist 1987d).

After this very late coming of age of national research it is now possible to present a first chronostratigraphical sequence of past human events in a Central African equatorial forest environment. Though still provisional the sequence is important in enabling us to offer working hypotheses and to question several seminal points in the area's history:

- the first human occupation of the equatorial forest, believed to have been late due to the supposed harsh living conditions;
- the technological evolution of Late Stone Age hunter-gatherers leading to:
- their interaction with and the arrival of Bantu-speaking villagers in Neolithic and Iron-Age times.

Topography and vegetation of Gabon

Gabon covers 267,000 km² astride the equator in Central Africa. Bounded on the west by the Atlantic Ocean, to the north by Equatorial Guinea and Cameroon, and to the east and south by Congo, the country is mostly covered by equatorial forest which, today, supports an average of 1.5 persons per square kilometre. The total present population of the country is probably *ca* 750,000, nearly half of them in Libreville.

Gabon's geology enables one to divide the country into three areas: the substratum, the old sedimentary basins, and the young sedimentary basins. Formations of the old substratum are found in the north and north-east where the crystalline rocks form hilly plateaux. The northern plateau of Minvoul reaches 650 m above sea level, while the Ivindo Plateau in the east is slightly lower. Near the Congo border in the east the iron-rich Belinga and Boka-Boka

mountain ranges rise to 900–1000 m. Further south the Chaillu and Mayombe massifs and the Cristal and Ndjolé mountains represent the remains of ancient formations, with altitudes around 800–1000 m.

The old sedimentary basins occur in the south-east around Okondja and Franceville, and in the south where the Nyanga and Ngounié valleys are overlooked by the Ikoundou mountain range.

Finally, the young sedimentary basins are represented by the Batéké plateau in the south-east and by the coastal formations. The Batéké plateau, of sand, is 550–830 m high and bisected by watercourses. On the coast two different zones are recognized. To the north, between Port-Gentil and the Rio Muni, which marks the border with Equatorial Guinea, the rocky substratum, although largely covered by sand and mud, forms a series of points and inlets. In the flatter country to the south of Port-Gentil, sandy beach-lines form large lagoons, as at Fernan-Vaz, Ndogo and Banio.

Gabon's vegetation comprises equatorial forest, wooded savannas, grass savannas, inundated forest and mangroves. The equatorial forest, covering 75% of the country, is either primary or secondary. The latter, identified by the presence of Okoumé trees (*Aucoumea klaineana*) will not be discussed here as it is mainly the result of timber exploitation during the past 80–100 years. Some 55,000 km² of true primary forest without Okoumé can still be found in the north and north-east of Gabon.

Wooded savannas occur on the middle reaches of the Ogooué river in central Gabon, in Ngounié and Nyanga provinces and in the Haut-Ogooué province. Grass savannas are found all along the coast from opposite Libreville southwards, and on the Batéké plateaux.

Inundated forest can be encountered on the lower reaches of rivers near their estuaries, e.g. the Komo and Bokoué rivers south of Libreville. It can be also found around the lakes of Lambaréné and along some watercourses in the north and east which connect with the marshes of Congo and Zaïre. The mangroves are limited to the coast between Port-Gentil and the Rio Muni. The rocky substratum covered by sand and mud is well suited to mangrove development, unlike the sandy reaches further south.

Late-Pleistocene and Holocene climatic changes in Central Africa

The following review of past climatic changes is a synthesis of work in oceanography, pedology, geomorphology, palynology and zoology applied to archaeological interests and more specifically to palaeoecological reconstructions.

The first climatic episode clearly demonstrable in Central Africa is the cold Maluekian dry phase during which savannas expanded (De Ploey 1963); it is dated between 70,000 and 40,000 bp (Giresse 1978; Moguedet *et al.* 1986). Stone-lines (Fig. 1) were formed near the end of this episode when a wet phase was setting in (Heinzelin 1952; Vogt and Vincent 1966). This Ndjilian wet episode (Schwartz 1985; Schwartz *et al.* 1985), whose maritime analogue is the Inchirian transgression (Giresse 1978), saw rainfall on the increase, the sea level rising within 10 m of today's level (Giresse 1978). Several dates obtained from peat on the littoral place the Ndjilian between 40,000 and 30,000 bp (Delibrias *et al.* 1973). Around 28,000 bp a short arid phase has been illustrated (Clark and Van Zinderen Bakker 1962; De Ploey 1963; Roche 1979).

Starting at 30,000 bp and ending around 12,500 bp, the dry Leopoldvillian episode is



Figure 1 The Kango stone-line, Estuaire province.

linked with the Ogolian regression when the sea dropped 110 m below its present level. The savannas must have known a large extension while the equatorial forest shrank to its minimum cover (Giresse 1978; Caratini and Giresse 1979; Maley and Brenac 1987). This dry episode was not uniform; *ca* 14,000–13,000 bp fresh water is indicated in deep-sea samples near coastal rivers (Moguedet *et al.* 1986). Later, between 13,000 and 12,000 bp, fresh water from coastal rivers decreased in volume and a coastal shell layer was formed 100–110 m below modern sea level (Moguedet *et al.* 1986; Giresse *et al.* 1986). The driest period of the Leopoldvillian seems to have occurred *ca* 18,000–15,000 bp.

After the short wet/dry phase *ca* 14,000–13,000 bp, the Kibangian wet episode is attested. Rainfall increased, the sea level rose very rapidly (Holocene transgression) by *ca* 90 m between 12,000 and 9000 bp (Giresse *et al.* 1986). Savannas must have decreased in area, forest taking over most of Central Africa. New stone-lines could have been formed at the Leopoldvillian/Ndjilian interface *ca* 30,000 bp. The Kibangian maximum is dated *ca* 7000 bp. It shows well in the palynological record and also in palaeozoological studies (Roche 1979; Caratini and Giresse 1979; Giresse and Kouyoumontzakis 1974; Roche and M'Benza-Muaka 1980; M'Benza-Muaka *et al.* 1984; Maley 1987; Elenga 1987; Maley and

Brenac 1987; Van Neer 1984; Van Neer and Lanfranchi 1985; Van Neer 1987; Maret *et al.* 1987). The Kibangian ended around 4000 bp. Between 4000 and 2500 bp a dry episode is indicated in the palynological record in south-eastern Zaïre. Starting around 2000 bp more humid conditions bring us up to present times (Caratini and Giresse 1979; Roche and M'Benza-Muaka 1980; M'Benza-Muaka *et al.* 1984).

From what we have seen above it seems likely that most of the stone-lines found in Central Africa and containing artefacts were either formed during the Maluekian (*ca* 70,000–40,000 bp) or during the Leopoldvillian (30,000–12,500 bp). These two dry episodes may have been the only ones at the end of which large downpours were able to concentrate large pebbles from hill-slopes to form the so-called stone-lines (Lanfranchi 1986; Lanfranchi and Schwartz *in press*). It follows that the artefacts found embedded in the stone-lines must be considered not to be *in situ* but in mixed secondary deposits. Artefacts lying on the stone-lines must be considered as possibly *in situ* since in some cases it can be shown that knapping debris fell directly onto the uncovered stone-line (Lanfranchi 1987:7). By typological comparison with well dated sites in East and southern Africa these industries, between 70,000 and 12,500 bp in Central Africa, can be designated Middle Stone Age. The earliest date must not be considered finite. We have seen that it dates the earliest stone-lines themselves, but that artefacts embedded in them may be older.

The Stone Age sequence in Gabon: the ancient industries

In a recent synthesis about the north-western part of Central Africa which includes Gabon (Cahen 1982), the earliest known industries were attributed to a 'post-Acheulean industrial complex' (Cahen 1978b). It was stressed that no serious stratigraphical evidence was yet available which would enable this complex to be subdivided. Although this was a very provocative and stimulating concept at the time, further field and laboratory work done since then is slowly redefining old groupings and schemes (Muya 1986; Maret *et al.* 1987; Lanfranchi *in preparation*). Likewise, in more easterly regions two archaeological sites – Matupi and Ishango in north-eastern Zaïre – have yielded Late Stone Age artefacts dated to *ca* 24,000 bp (Heinzelin 1957; Brooks and Smith 1987; Van Noten 1977, 1982; Muya 1986). At Matupi the earliest true microliths are dated between *ca* 33,000 and 22,000 bp (Van Noten 1977, 1982). At Ishango *ca* 24,000 bp microliths are associated with double-barbed harpoons, flakes, cores and wild fauna (Brooks and Smith 1987).

In Gabon the artefacts with which we are here concerned come from different types of context subsumed under the term 'stone-lines' (Heinzelin 1952; Vogt and Vincent 1966). It can be shown they are alluvial, hill-slope deposits representing old fluvio-lacustrine systems (Peyrot and Oslisly 1986; Bayle des Hermens *et al.* 1987). To facilitate discussion we here group the industries according to whether they were found in the stone-lines, on top of the formations or in the lower part of the superficial deposits.

Industries found in the upper part of the stone-lines

Such industries are currently known from six sites in Gabon (Fig. 2). At the Ngollo river site (Moyen-Ogooué province) a 30-m high fossil river bed – formerly a tributary of the Ogooué – covered by some 2 m of clayish colluvium, yielded an homogeneous series of stone tools,

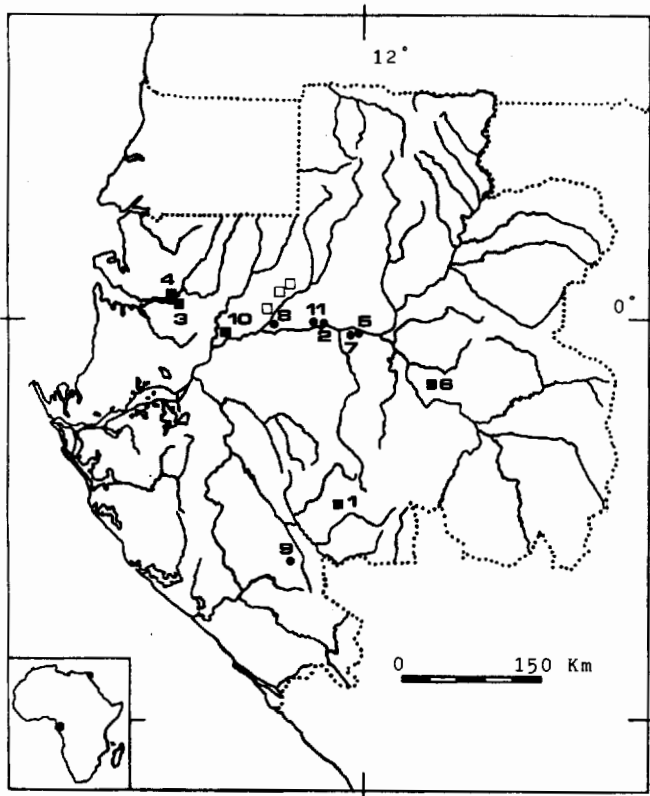


Figure 2 Location map of Middle Stone Age sites in Gabon. 1: AX, 2: Ayem, 3: Kafélé, 4: Kango, 5: Kazamabika, 6: Km.468, 7: Lopé, 8: Médoumane, 9: Ndendé, 10: Ndjolé CS, 11: Ngolo.

made from vein quartz formerly present on the slopes of the valley or quartzite pebbles from the river. Lightly rolled, the tools had not been transported a long way by the river flow. The absence of flakes shows that the lighter elements were transported further downstream. The tools are mainly (83%) choppers of Biberson's (1966) types I and II (Fig. 3). The importance of these choppers and the relative rarity of picks (8.5%) is an indication of the antiquity of this assemblage. One trihedral point is also present. The rest of the industry is made up of cores.

At the Lopé site (Ogooué-Ivindo province) the artefacts, made from quartzite and quartz pebbles, occur in hill-flow gravel. They consist of choppers of Biberson's types I and II (71.4%), with some simple or double-ended picks (22.8%). Some flakes and a hand-axe are also present. A few of the choppers are partly knapped bifacially.

The Médoumane site in Moyen-Ogooué province is a fluvio-lacustrine deposit (Peyrot and Oslisly 1986). It consists of fluvial products and partly of washed elements from the nearby hills. The artefacts are very rolled; they form nevertheless an homogeneous assemblage. As at other sites in this category, choppers are numerous (33.8%) with different subtypes of picks in equal numbers (39.7%). Hand-axes are also present (5.7%). The rest of the industry consists of scrapers and various retouched flakes. Several types of quartzite were used (73.6%), the other artefacts being of quartz.

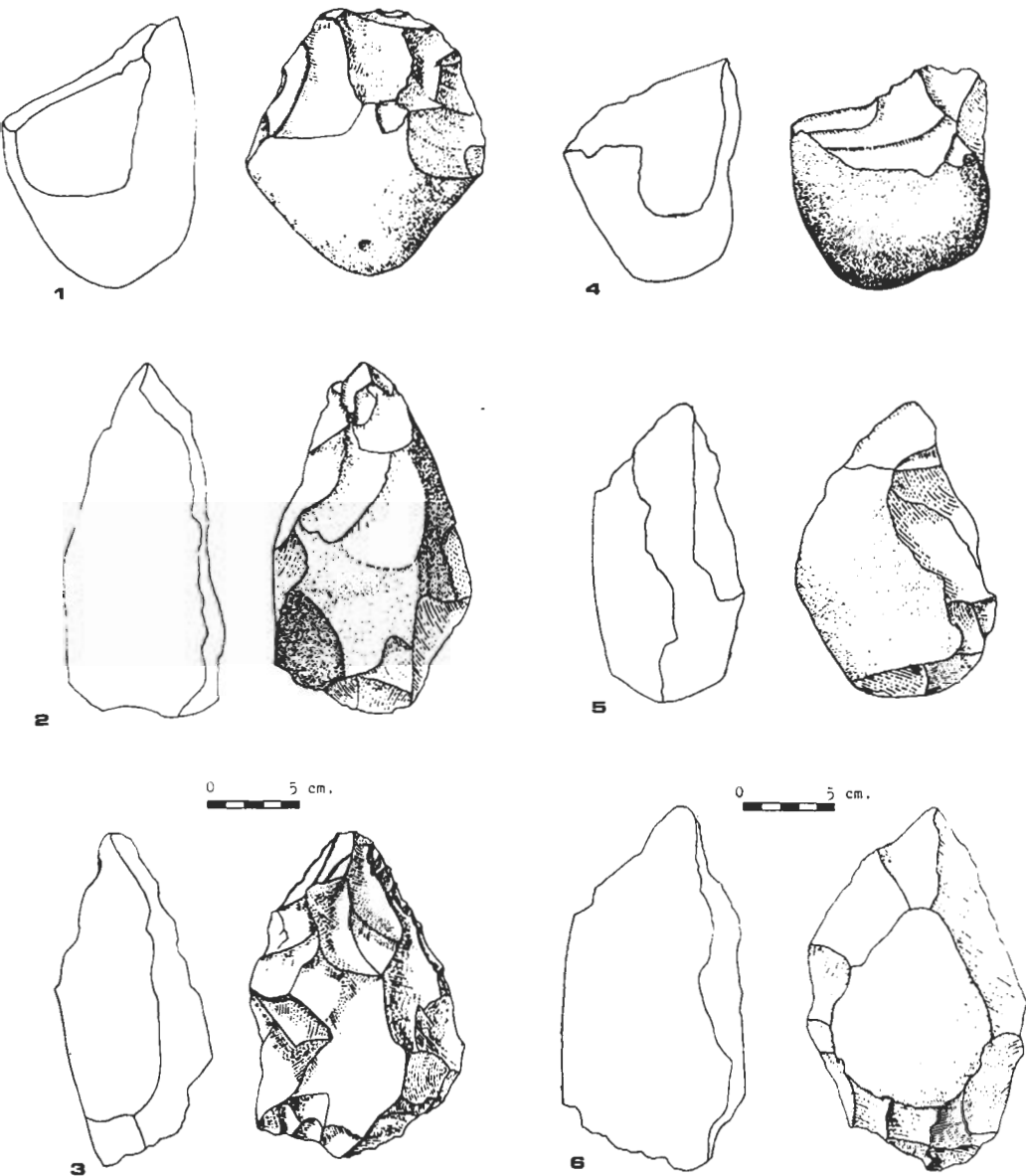


Figure 3 Middle Stone Age tools from stone-lines. 1, 2 and 3: from Médoumane site, 4, 5 and 6: from Ngolo. 1 and 4: choppers, 2, 5 and 6: various picks, 3: handaxe.

At Ayem (Ogooué-Ivindo province) two artefacts – a flake and a pick – were found in the 10-m-high fossil river bed of the Ogooué which now flows further down-slope.

Work by Omar Bongo University has recently been conducted on the Ndendé archaeological site in Ngounié province. There, a ferruginous stone-line composed of laterite pebbles has in its upper part a core and a flake and in its lower part pebble fragments with waste products (Digombe *et al.*, *in press a*). Near to the Lopé site in the Lopé faunal reserve a second site similar to Lopé was discovered in 1986 at Kazamabika.

Industries found on top of the stone-lines

It is at Kango and at Kafélé on either side of the confluence between the Komo and Bokoué rivers (Estuaire province) that we found the best instance of artefacts on the top of the local stone-line (Fig. 4). We cannot agree with a recent paper (Locko 1987) on the typology and stratigraphy of Kango (Bayle des Hermens *et al.* 1987; Peyrot and Oslisly 1986). Our analysis of the sample collected at Kango does not include any planes or cleavers as described by Locko. It shows a high proportion of choppers (type I and II of Biberson, 47.2%) with numerous picks (13.9%) and flakes (27.8%), as well as concave and convex side-scrapers.

The deposits at Kango must not be considered as *in situ*. They are secondary deposits; lateral movement of the stone-line after its initial formation is evidenced by a doubling of the

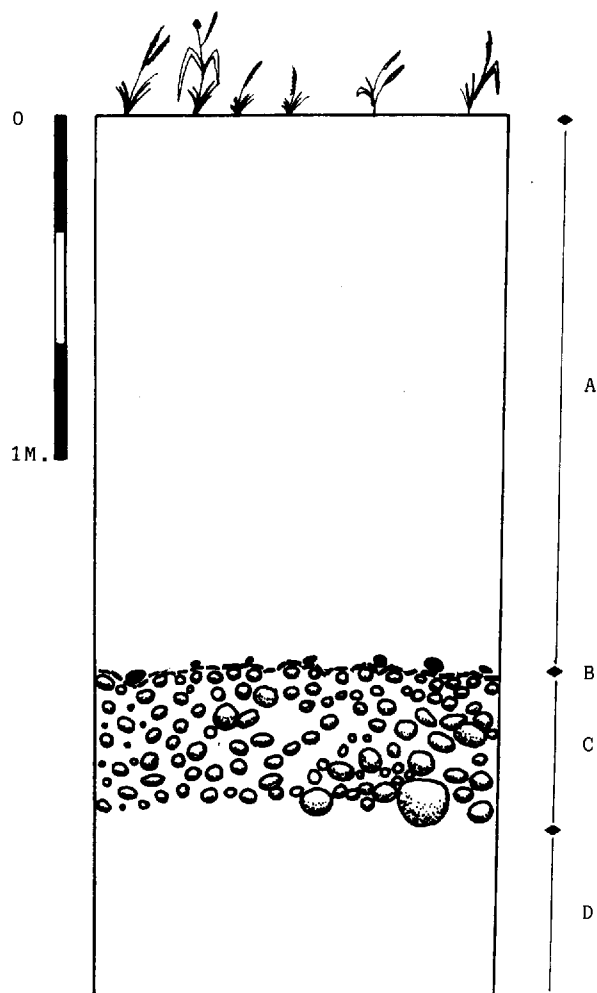


Figure 4 Stratigraphical position of Middle Stone Age artefacts at Kango. A: clay, B: position of artefacts, C: stone-line, D: 'C' horizon.

original formation in some areas of the Kango hills. Artefacts are found from the top of the stone-line up to *ca* 40 cm into the overlying clay colluvium.

Sites were discovered in the 1960s by members of the SPPG in similar contexts in Moyon-Ogooué and Ngounié provinces. In Moyon-Ogooué three such sites were identified along the Alembe-Lalara road beside the Okano river. Near Mevang village under 8 m of colluvium two picks were found. Further north, two 'very ancient Sangoan' sites yielded large picks, hand-axes and large discoid scrapers. The picks, made from quartz and quartzite, were very worn. The artefacts were lying under 1.5–2.0 m of clay on top of a stone-line (Farine 1965; Blankoff 1969).

In Ngounié province the site designated AX by the SPPG was discovered by P. Chatelin: a pebble formation (river terrace) was buried under 1.1 m of sandy-clay earth. On the stone-line scrapers, blades, bladelets and burins were found; striking platforms are faceted. Tools and débitage were worked in a black jasper (Farine 1963:48). On the Lastourville/Ivindo transect along the Transgabonais railway at kilometre 468 an ancient river bed made up of gravels had on its top nine artefacts in black jasper: picks, polyhedrals and choppers (Peyrot and Oslisly 1984: 3).

Industries in the bottom part of the sandy-clay colluvium

Near Ndjolé, B. Farine (1965:72) reported an industry characterised by quartz (blades, flakes) and quartzite (planes) artefacts; one half bifacial point, rather thick, is also mentioned. The industry was designated Lupemban.

In Gabon the only true site in this category which has been studied by excavation and in which ancient tools were found is the CS site at Ndjolé in Moyon-Ogooué province. In 1964 and 1965 the SPPG organised fieldwork. From 75 to 185 cm depth several artefact concentrations were encountered. Two different series are mentioned: from 75 to 160 cm an 'industry with flakes, blades in quartz with some rare picks', and from 160 to 185 cm (the top of the underlying stone-line) an 'industry on flakes with numerous picks, blades and points' (Pommeret 1965a). Several fine bifacial points were also recovered at this depth (Fig. 5).

Discussion

It is highly probable – though not yet demonstratable – that all the stone-lines in their present state, i.e. with evidence of secondary admixtures, are of Maluekian or earlier age, *ca* 40,000 bp at the latest (Lanfranchi 1986; Lanfranchi and Schwartz *in press*). It is possible that some stone-lines were originally formed before the Maleukian during a more ancient succession of dry/wet phases. It follows that the industries found in the upper part of the stone-lines are at least 40,000 years old. They are characterised by different types of choppers or cores and picks with occasionally a few hand-axes, as at Médoumane. In neighbouring countries the same industries are found in similar contexts (Bayle des Hermens 1975; Bayle des Hermens *et al.* 1980; Lanfranchi 1986; Van Moorsel 1968; Hervieu 1969). The absence of Middle Stone Age (MSA) tools resembling Sangoan or Lupemban specimens in the stone-lines is another argument for their antiquity (see also Lanfranchi 1986; Lanfranchi and Schwartz *in press*, for similar arguments).

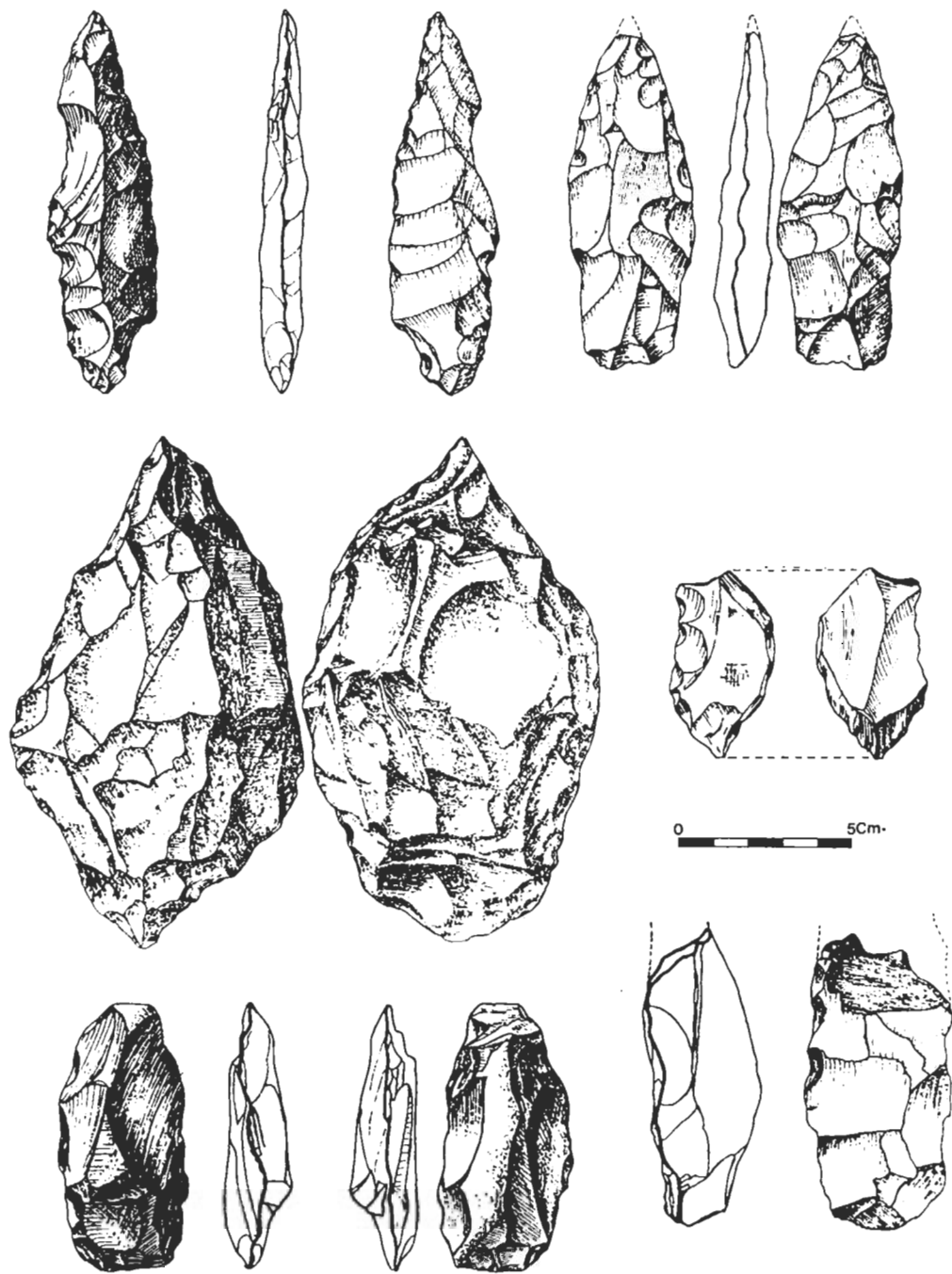


Figure 5 Middle Stone Age tools excavated from the Ndjolé CS site.

Industries found on top of the stone-lines are another problem entirely. At Kango and Kafélé it has been shown that two series are mixed (Bayle des Hermens *et al.* 1987). One of them is similar to Sangoan-like industries found in the stone-lines; the other, with bifacial tools or 'outils bifaces à bords plus ou moins parallèles', is similar to MSA industries found elsewhere (Clark 1963; Van Moorsel 1968; Cahen 1975, 1976; Lanfranchi 1986, 1987).

Finally, the tools found in the lower part of the clayey colluvium, with large bifacial points, picks, blades and flakes, have striking similarities with the so-called Lupemban industries of the MSA. This industrial complex is dated elsewhere in Central Africa to 46,000/12,000 bp. While the Sangoan may be as late as 46,000–26,000 bp (Cahen 1976, 1978b; Cahen *et al.* 1983; Clark 1963; Van Moorsel 1968), the Lupemban is dated to 27,000/12,000 bp (Van Moorsel 1968; Cahen 1976, 1978b; Cahen *et al.* 1983; Maret *et al.* 1977; Kouyoumontzakis *et al.* 1985). What we have seen of the stone-lines' genesis agrees well with this.

For the time being, in Gabon one must expect early MSA industries with choppers, picks, hand-axes to be found in the stone-lines dating to before 40,000 bp, and late MSA industries with large bifacial points to occur either on top of the stone-lines or in the lower part of the colluvium. The latter industries may post-date 40,000 bp, but they clearly preceded the true LSA industries. No true Acheulean or pre-Acheulean sites have yet been found in Gabon. This may be due to the absence of man during the long wet episodes; the equatorial forest would have been an impediment for human settlement. It is relevant to note the presence of hand-axes on today's forest fringe, the northern and southern savannas in Centrafrique, Angola and Zaïre's Shaba region. The people responsible for true MSA assemblages would have penetrated the more central parts of the basin during the dry episodes which witnessed the forest's regression.

The Late Stone Age in Gabon

The Late Stone Age (LSA) is known from five excavated and dated sites in the country (Fig. 6). The dates obtained are rather late compared with those from, for example, Matupi cave in Zaïre, where a similar industry's earliest facies was dated between 33,000 and 22,000 bp (Van Noten 1982b), or Ishango, dated 24,000–20,000 bp (Heinzelin 1957; Brooks and Smith 1987).

In the Estuaire province the Owendo and Nzogobeyok sites are known. At Owendo a LSA layer without potsherds was dated to the fourth millennium bc (Tab. 1, no. [9]). This layer was made up of charcoal mixed with some quartz and flint flakes and tools of microlithic dimensions, including a segment and a trapeze (Cahen 1978a). The Owendo site lies in the coastal white sand dunes: a geomorphological analysis by B. Peyrot on the same type of formation further north at Nzogobeyok (the Libreville 'Sablières' site) has demonstrated the existence of an old dune system on a fossil sea-shore formed after 10,000 bp (Clist *et al.* 1988).

At the Nzogobeyok site proper, sub-horizontal discontinuous charcoal layers are buried at depths between 60 and 90 cm. Mixed with the charcoal were flint (96.1%), quartzite (1.0%) and quartz (2.9%) artefacts. The assemblages comprised microliths of the same type as at Owendo: segments with scrapers, *outils esquillés*, etc. ¹⁴C dates range from the sixth to the third millennium bc [2, 4, 5, 6, 7, 11, 13]. The dates confirm the stratigraphic and geomorphological reconstruction and indicate repeated temporary occupation of the coastal dunes (Clist *et al.* 1988). The later dates are associated with small potsherds. It is possible

Table 1 Radiocarbon dates from Gabon (key for material: C=charcoal, P=palm nuts, S=shells, E=humic earth, P=peat). Dates are cited in the text by numbers in square brackets.

Lab. number	Site, Province	Date bp	Material	Association
<i>Late Stone Age:</i>				
1. Beta-16,742	Lopé 2, Ogooué-Ivindo	7670±80	C	Lithics
2. Gif-6175	'Sablères', Estuaire	7500±90	C	Lithics
3. Beta-20,060	Ndendé, Ngounié	6450±130	C	Lithics
4. Gif-6907	'Sablères', Estuaire	6450±80	C	Lithics
5. Beta-25,547	Nzogobeyok, Estuaire	6190±80	C	Lithics
6. Beta-14,828	'Sablères', Estuaire	5950±70	C	Lithics
7. Beta-14,831	'Sablères', Estuaire	5710±80	C	Lithics, sherds
8. Beta-22,081	Ndendé, Ngounié	5420±120	C	Lithics
9. Gif-4157	Owendo, Estuaire	5040±150	C	Lithics
10. Beta-22,082	Ndendé, Ngounié	4990±120	C	Lithics
11. Gif-5987	'Sablères', Estuaire	4870±90	C	Lithics, sherds
12. Beta-18,731	Ikengué, Ogooué-Maritime	4830±290	C	Lithics
13. Beta-14,829	'Sablères', Estuaire	4400±70	C	Lithics, sherds
14. Beta-20,068	Mandilou, Ngounié	3890±140	C	Lithics
15. Beta-18,728	Ikengué, Ogooué-Maritime	3850±90	C	Lithics
16. Beta-17,518	Ikengué, Ogooué-Maritime	3250±70	C	Lithics
17. Beta-18,729	Ikengué, Ogooué-Maritime	2550±120	C	Lithics
<i>Neolithic:</i>				
18. Beta-20,789	River Denis 1, Estuaire	4810±80	C	Sherds, lithics
19. Lv-1513	Mont Brazza, Ogooué-Ivindo	3560±75	C	Sherds, lithics, grindstones
20. Beta-17,061	River Denis 1, Estuaire	3400±70	C	Sherds, lithics
21. Beta-25,549	Okala 1, Estuaire	2460±60	P	Sherds, lithics, polished tool
22. Beta-14,825	Kango 5, Estuaire	2460±70	C	Sherds
23. Beta-16,174	Ikengué, Ogooué-Maritime	2460±80	C	Sherds, lithics
24. Beta-17,239	Mbilapé 4, Ogooué-Maritime	2460±50	C	Sherds
25. Beta-25,582	Okala 1, Estuaire	2450±70	P	Sherds, lithics
26. Beta-16,942	Mbilapé 4, Ogooué-Maritime	2420±140	C	Sherds
27. Lv-1515	Ndjolé PK5, Moyen-Ogooué	2370±55	C	Sherds
28. Beta-17,060	Kango 5, Estuaire	2320±70	C,P	Sherds, grindstones
29. Beta- 25,546	Okala 1, Estuaire	2290±80	P,C	Sherds, lithics
30. Beta-16,943	Mbilapé 2, Ogooué-Maritime	2290±90	C	Sherds
31. Gif-7525	Lopé 12, Ogooué-Ivindo	2280±80	C	Sherds, polished tool
32. Gif-6906	Kango 5, Estuaire	2270±60	C	Sherds
33. Beta-20,788	Okala 1, Estuaire	2250±60	P	Sherds, lithics
34. Beta-20,790	Okala 1, Estuaire	2230±60	P	Sherds, lithics, grindstones
35. Beta-25,548	Okala 1, Estuaire	2120±60	P	Sherds, lithics
<i>Dates of uncertain cultural attribution:</i>				
36. Gif-6678	'Sablères', Estuaire	2490±50	C	Lithics, iron, slag.
37. Lv-1516	Franceville, Haut-Ogooué	2440±70	C	Sherds

Table 1 continued.

Lab. number	Site, Province	Date bp	Material	Association
38. Beta-15,067	Otoumbi 5, Moyen-Ogooué	2260±120	C	Sherds
39. Gif-6909	Mont Brazza, Ogooué-Ivindo	2130±60	C	Sherds
<i>Early Iron Age:</i>				
40. Beta-14,834	Otoumbi 2, Moyen-Ogooué	2640±70	C	Slag
41. Gif-7130	Otoumbi 2, Moyen-Ogooué	2400±50	C	Slag
42. Beta-14,427	Moanda 1, Haut-Ogooué	2350±140	C	Slag, tewels
43. Beta-14,428	Moanda 2, Haut-Ogooué	2330±90	C	Slag, tewels
44. Lv-1521	Oyem 2, Woleu-Ntem	2280±55	C	Sherds, slag
45. Lv-1520	Oyem 2, Woleu-Ntem	2220±75	C	Sherds, slag
46. Beta-15,742	Moanda 2, Haut-Ogooué	2220±90	C	Tewels, slag
47. Beta-12,207	Mouila, Ngounié	2150±90	C	Slag
48. Beta-17,043	Moanda 1, Haut-Ogooué	2150±90	C	Slag, tewels
49. Beta-17,044	Moanda 2, Haut-Ogooué	2150±110	C	Slag, tewels
50. Lv-1514	Makokou, Ogooué-Ivindo	2150±70	C	Sherds, slag
51. Beta-17,045	Moanda 2, Haut-Ogooué	2070±70	C	Slag, tewels
52. Beta-15,063	Lopé 4, Ogooué-Ivindo	2130±110	C	Slag
53. Beta-15,059	Koualessis, Woleu-Ntem	2110±70	C	Slag, tewels
54. Beta-15,738	Moanda 1, Haut-Ogooué	2050±100	C	Slag, tewels
55. Beta-15,741	Moanda 2, Haut-Ogooué	2050±60	C	Slag, tewels
56. Beta-15,066	Otoumbi 4, Moyen-Ogooué	1980±80	C	Sherds, bricks
57. Beta-14,832	Oveng, Estuaire	1970±70	S	Sherds, slag, tewels
58. Gif-6423	Otoumbi 2, Moyen-Ogooué	1970±70	C	Slag
59. Beta-16,319	Mbilapé 4, Ogooué-Maritime	1930±110	C	Sherds
60. Beta-12,208	Mouila, Ngounié	1920±80	C	Bricks, slag, tewels
61. Beta-15,058	Koualessis, Woleu-Ntem	1920±60	C	Slag, tewels
62. Beta-20,063	Yombi, Ngounié	1910±80	C	Slag
63. Lv-1519	Kango 5, Estuaire	1900±70	C,P	Slag, sherds
64. Beta-15,068	Otoumbi 5, Moyen-Ogooué	1900±90	C	Sherds
65. Gif-6908	Otoumbi 1, Moyen-Ogooué	1860±60	C	Slag
66. Beta-20,069	Mandilou 3, Ngounié	1860±90	C	Slag
67. Gif-6675	Moanda, Haut-Ogooué	1850±70	C	?
68. Beta-9082	Moanda 1, Haut-Ogooué	1850±70	C	Slag, tewels
69. Gif-7524	Okanda 5, Ogooué-Ivindo	1840±60	C	Sherds, slag
70. Beta-20,064	Mouila 1, Ngounié	1770±60	C	Sherds
71. Beta-14,833	Oveng, Estuaire	1740±60	C,P	Sherds, slag, tewels
72. Beta-14,835	Otoumbi 1, Moyen-Ogooué	1740±60	C	Slag
73. Beta-14,830	Oyem 1, Woleu-Ntem	1710±60	C	Slag
74. Gif-7197	Otoumbi 5, Moyen-Ogooué	1700±50	C	Sherds, slag
75. Beta-9077	Mboma, Haut-Ogooué	1680±100	C	Slag
76. Beta-10,301	Mouila, Ngounié	1670±50	C	Tewels, slag, bricks
77. Gif-6905	Kafélé 2, Estuaire	1670±80	C,P	Sherds
78. Gif-6424	Oveng, Estuaire	1650±70	S	Sherds, slag, tewels

Table 1 continued.

Lab. number	Site, Province	Date bp	Material	Association
79. Gif-7430	Otoumbi 8, Moyen-Ogooué	1640±70	C	Sherds
80. Gif-7196	Otoumbi 5, Moyen-Ogooué	1630±50	C	Sherds, slag
81. Beta-9706	Massango, Haut-Ogooué	1600±50	C	Sherds
82. Beta-15,740	Moanda 2, Haut-Ogooué	1560±100	C	Slag, tewels
83. Beta-16,320	Mbilapé 4, Ogooué-Maritime	1440±110	C	Sherds
84. Beta-20,784	Malékou, Estuaire	1290±140	C	?
85. Gif-6121	Mikoulougou, Haut-Ogooué	1230±70	C	Sherds
86. Beta-20,065	Ditouba, Ngounié	1200±60	C	Bricks
87. Gif-6426	'Sablières', Estuaire	1150±60	C	Sherds, iron
88. Gif-6674	Moanda, Haut-Ogooué	1140±200	C	Sherds, slag
89. Beta-16,941	Batanga 1, Ogooué-Maritime	1080±90	C	Sherds
90. Gif-6677	Mouila 2, Ngounié	1010±200	C	Slag, tewels, bricks
91. Beta-9080	Lébombi, Haut-Ogooué	980±70	C	Sherds, iron
<i>Late Iron Age:</i>				
92. Beta-20,066	Ditouba, Nyanga	930±60	C,P	
93. Hv-13,432	Charbonnages, Estuaire	850±60	C	
94. Lv-1517	Kango 2, Estuaire	800±60	C	
95. Lv-1518	Nkol Ogoum 2, Estuaire	710±50	C,P	
96. Beta-15,064	Lopé 5, Ogooué-Ivindo	660±80	C,P	
97. Beta-9079	Lébombi, Haut-Ogooué	590±60	C	
98. Hv-13,430	Charbonnages, Estuaire	565±50	S	
99. Beta-20,786	Moanda Gare, Haut-Ogooué	520±50	C	
100. Beta-18,733	Ikengué 1, Ogooué-Maritime	400±70	C	
101. Beta-9078	Lébombi, Haut-Ogooué	400±50	C	
102. Beta-20,785	Malékou, Estuaire	380±90	C?	
103. Beta-17,519	Ikengué 1, Estuaire	370±60	C	
104. Beta-14,827	85/26, Woleu-Ntem	360±60	C	
105. Beta-15,061	Mbam, Woleu-Ntem	350±70	C	
106. Beta-15,062	Soukoudzap, Woleu-Ntem	270±60	C	
107. Beta-17,520	Ikengué 1, Ogooué-Maritime	230±60	C	
108. Beta-18,735	Ikengué 1, Ogooué-Maritime	220±50	C	
109. Gif-6759	Makokou, Ogooué-Ivindo	200±100	C	
110. Beta-15,060	Ndzomossi, Woleu-Ntem	140±80	C	
111. Beta-14,826	85/22, Woleu-Ntem	140±90	E	
112. Beta-18,732	Ikengué 1, Ogooué-Maritime	130±80	C	
113. Beta-12,209	Kango, Estuaire	120±100	?	
114. Gif-6676	Pk. 21,5 Moanda, Haut-Ogooué	80±50	C	
115. Gif-7526	Otoumbi 10, Moyen-Ogooué	modern	C	
116. Beta-18,730	Ikengué 1, Ogooué-Maritime	modern	C	
117. Gif-6425	Obaka 1, Ogooué-Ivindo	modern	C	

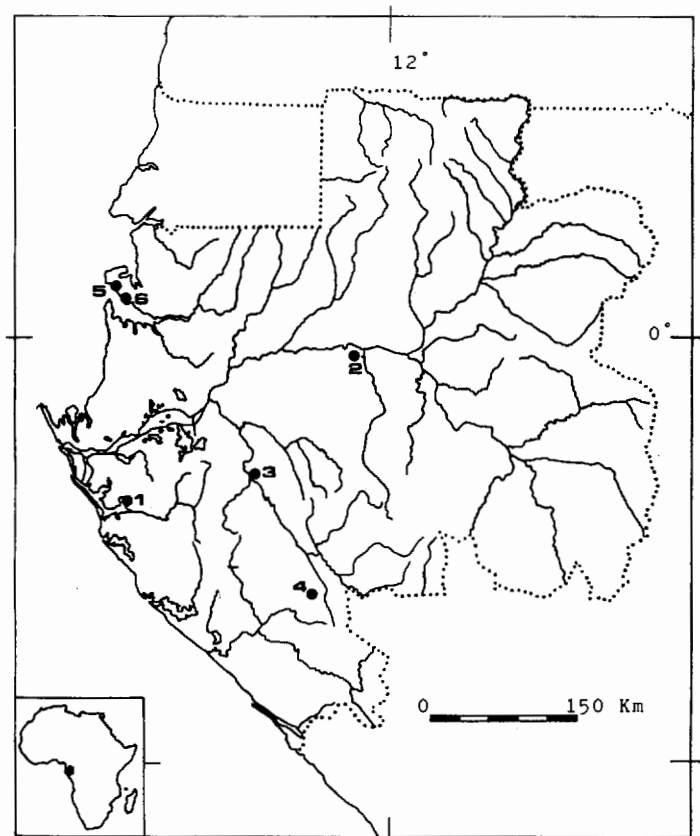


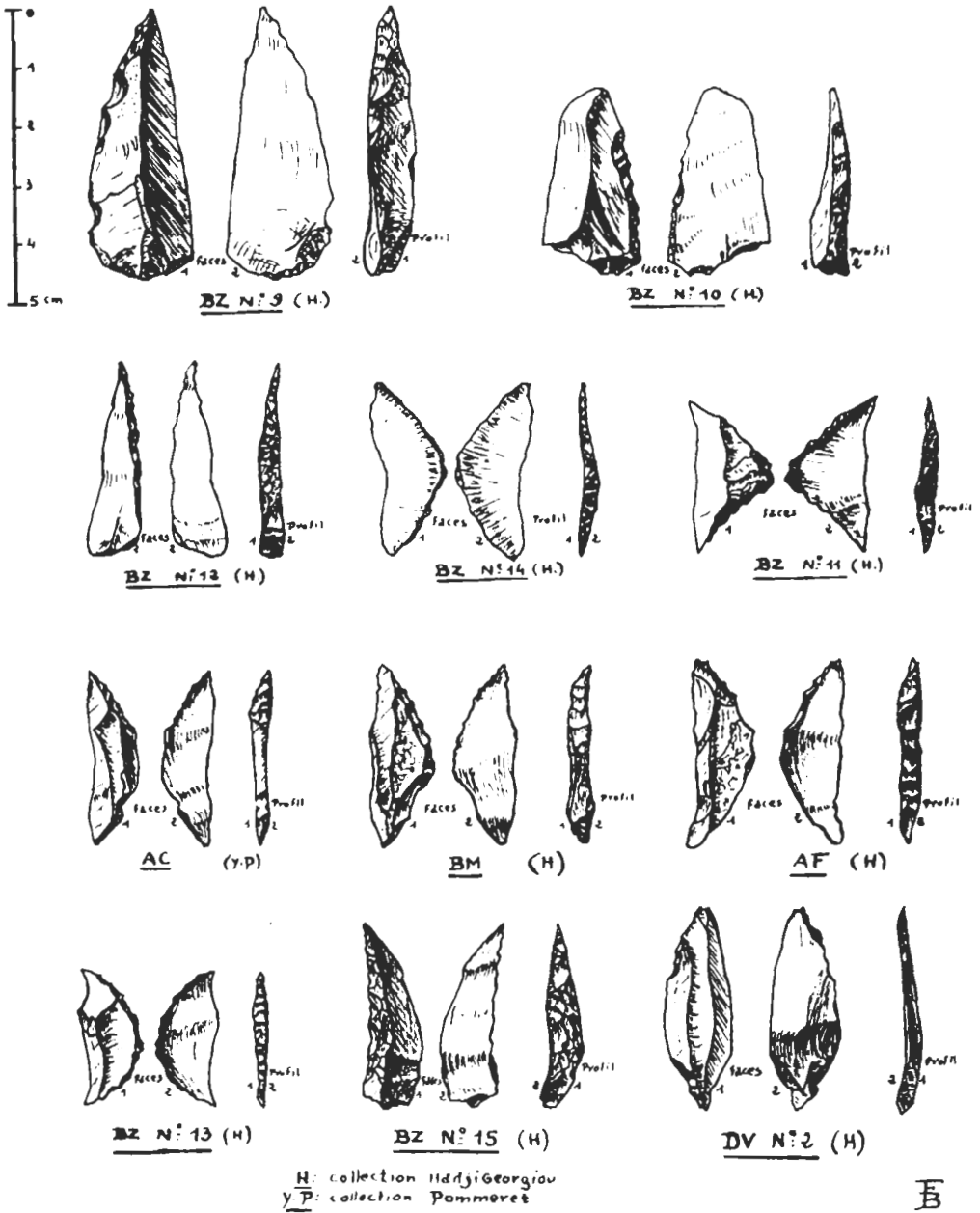
Figure 6 Location map of Late Stone Age sites in Gabon. 1: Ikengué, 2: Lopé, 3: Mandilou, 4: Ndendé, 5: Nzogobeyok, 6: Owendo.

that pots were being exchanged between early villagers and LSA groups, for several sites with neolithic assemblages on the other side of the Gabon estuary 20 km away are dated to the same period (Clist, *in press a*).

In the Ogooué-Ivindo province only one site, Lopé 2, has been excavated. A LSA layer composed of charcoal and quartz débitage with some rare quartzite flakes was dated to 7670 bp [1]: it is the oldest LSA date as yet processed from Gabon. Artefacts were knapped from small quartz pebbles. Tools comprise trapezes, scrapers, burins, backed flakes, *outils esquillés* and backed knives (Clist 1987b:12).

In Ngounié province the site of Ndendé has been studied by Omar Bongo University. Three dates have been processed: 6450 bp [3], 5420 bp [8] and 4990 bp [10]. They seem to come from different occupation layers. The microlithic industry, on black jasper, mostly consists of débitage. The few tools (1.2% of the assemblage) include denticulated flakes, retouched blades, etc. (Digombe *et al.* 1987, *in press a*).

The excavations in the 1960s by the SPPG around Libreville, e.g. the I/G site in the suburbs of the capital, yielded to B. Farine (pers. comm.) at 130–150 cm depth in the clay an industry with segments, transverse arrowheads, trapezes and no trace of large bifacial tools, although the latter are common in surface finds (Fig. 7).



20.3.65

Figure 7 Late Stone Age tools from the Libreville area (after *Bulletin de la Société Préhistorique et Protohistorique gabonaise* 3:81).

LSA sites can be found either in the clay mantle above the laterite, or in the sandy mantle of the coastal dunes. Spatial and stratigraphical analysis shows the artefacts to be quite dispersed in the superficial mantle (c.g. Fig. 8). Usually the raw material was locally available: flint on the coast, quartz in the savannas of central Gabon, black jasper from the

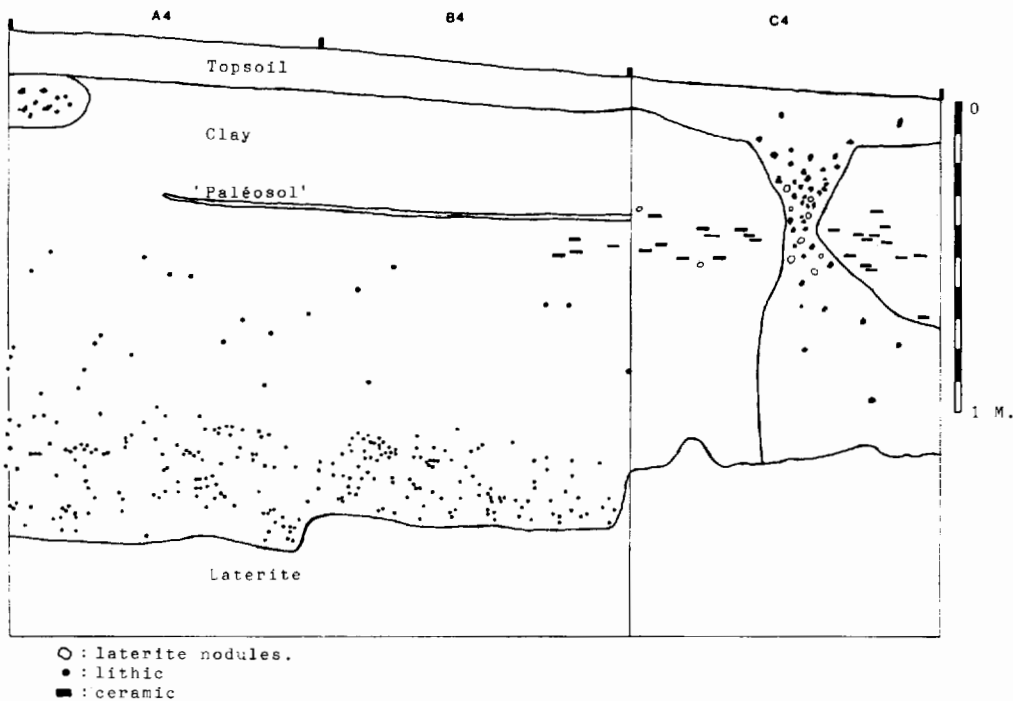


Figure 8 Vertical distribution of ceramics (short horizontal lines) and of lithic artefacts (dots) in the clay mantle at the BL site, Libreville, excavated by B. Farine in 1964.

southern savannas towards Congo. It seems that a radius of *ca* 20 km around the base camps was used to collect raw material for tool-making (Clist, *in press a*).

The Gabonese sites have in common with their counterparts in neighbouring countries the very low number of true tools (1 to 5%) and the high amount of waste, especially in the case of quartz industries. These industries are clearly distinct from the Tshitolian of southern Congo and Zaïre: no Tshitolian assemblages have yet been identified in Gabon. Also, from what we know of LSA industries in Cameroon, the Gabonese series must be for the time being isolated (Maret *et al.* 1987; Asombang, *in press*; Warnier and Asombang 1982).

The Neolithic in Gabon

There is broad agreement among archaeologists that pottery and ground stone tools were used in Central Africa before there was any knowledge of metal working (Maret and Nsuka 1977; Nsuka and Maret 1980). This neolithic stage has been dated in Cameroon to *ca* 3000 bp in the Yaoundé area (Maret 1982a, 1985b) and to *ca* 2250–1850 bp in Zaïre (Maret 1986). The megalithic monuments of Centrafriqic have been dated to 2800–2200 bp (Bayle des Hermens 1975; Calvocoressi and David 1979; David 1982; Vidal 1969) and may also be considered neolithic (David 1982). Clear evidence for the practice of any form of food production is, however, lacking.

In Gabon, polished axes and adzes have been found in many areas (Hamy 1897; Pommeret 1965b, 1966b, 1966c; Clist 1986) and considered to represent a neolithic stage

(Blankoff 1969; Maret 1982b; Vansina 1984). At Ndjolé a polished axe fragment was found in a refuse pit with ceramics (Pommeret 1965a). It was not until our excavations at Okala in 1987 that it was possible to date directly the use of polished tools and their association with potsherds (Clist 1987d).

Now two groups of sites can be subsumed under the heading of neolithic (Fig. 9):

- ancient sites, i.e. the river Denis 1 and 3 settlements dated to between 5000 and 3000 bp; and
- more recent sites mainly around Libreville on the right bank of the estuary dated to 2600–2200 bp.

The ancient sites have only been found, so far, on the left bank of the Gabon estuary, along the river Denis' savannas opposite Libreville. They are buried settlement layers under 0.5 m of sandy deposits. Associated in the occupation layer are ceramics, flint débitage and charcoal. Only test excavations have been yet carried out and the assemblage found cannot be considered representative. At the river Denis site 1, a charcoal sample has been dated to 4810 bp [18]; at site 3, the date obtained is 3400 bp [20].

The ceramics are very characteristic: they are flat-bottomed, with channelled rims,

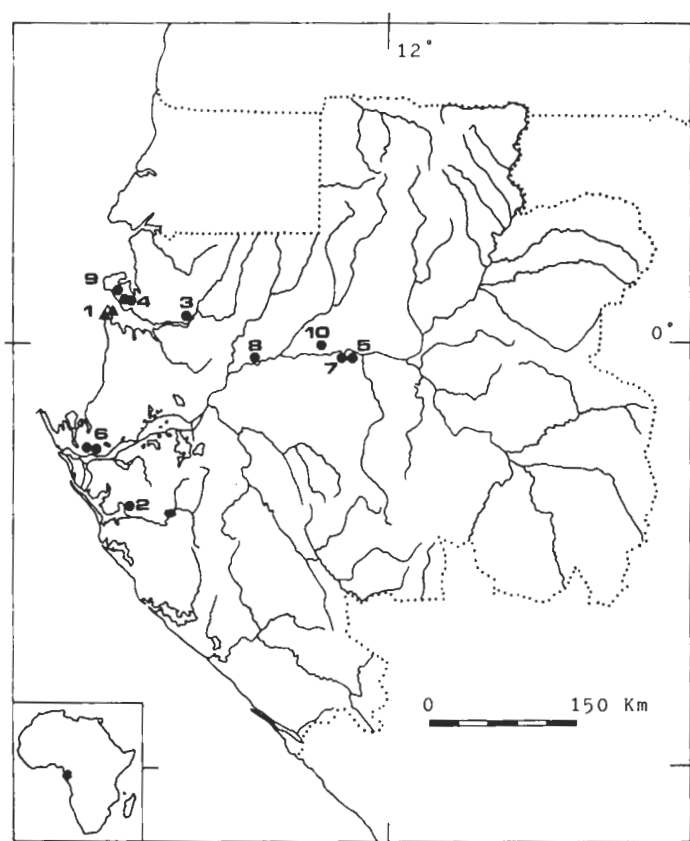


Figure 9 Location map of neolithic sites in Gabon. 1: river Denis 1 and 3, 2: Ikengué, 3: Kango 5, 4: Libreville, 5: Lopé 12, 6: Mbilapé 2 and 4, 7: Mont Brazza, 8: Ndjolé, 9: Okala, 10: Otoumbi 4.

decorated with impressions of a stick or rocked comb or with incised herringbone or chevron motifs. Closed forms are dominant with pots of various sizes; a few bowls represent the only open category of vessel shapes. The decoration mode used is very interesting: on the neck a zone is decorated either by means of impressed rocking comb, of simple stick impressions or left blank; from there to the body is an areal design of simple stick impressions or of impressed rocking comb. The flat bottoms may be decorated by rocking impressions or incisions. The flint débitage does not differ significantly from LSA assemblages.

This association of lithic artefacts and ceramics is contemporary with late LSA levels at the Nzogobcyok site (see above and Clist *et al.* 1988). We have recently found sherds with characteristic impressed decoration in a LSA level from the extremity of the dune system at Nzogobeyok (Clist and Lanfranchi 1988). It is possible that we have here at sites beside the Gabon estuary hints of contacts between the first sedentary peoples and the last LSA hunter-gatherers. The sherds discovered in LSA levels would be traces of economic contacts between villagers and hunters *ca* 4800–4400 bp.

Later, around 2600–2200 bp, several sites around the Gabon estuary have the same kind of neolithic assemblage: Ndjolé [27], Kango [22, 28, 32], Okala [21, 25, 29, 33, 34, 35], Lalala and Mindoubé (Clist 1987b and d). Similar ceramics have been found south of Port-Gentil on the Fernan Vaz lagoon at Ikengué and Mbilapé and dated *ca* 2500–2300 bp (Digombe *et al.* 1987a, 1987b, *in press* b). Four dates are relevant here: 2460 bp [23] at Ikengué, 2460 bp [24], 2420 bp [26] at Mbilapé 4 and 2290 bp [30] at Mbilapé 2. Preliminary analysis of the ceramics allows us to define a neolithic tradition termed the Okala Group (Clist 1988).

The sites are usually marked by the openings of ubiquitous pits. These are full of sherds, upper and lower grinding stones, ground stones, polished axe fragments, grooved stones, palm nuts, charcoal and burned clay pieces. The refuse pits are dug in the clay but sometimes their bottoms either rest on the top of, or are dug into, the laterite. They are *ca* 1 to 2 m in diameter and up to 2 m deep. Their fillings are either homogeneous from top to bottom or made up of successive layers of anthropic and natural origin; the pits were evidently filled very rapidly. The polished stone fragments are in green schist, and of the same typology as presumably contemporary artefacts found all over north-western and central Gabon, as in the Booué depression. The ceramics (Fig. 10) have common traits with the river Denis ware. Pots have grooved rims, flat bottoms sometimes decorated by impressed or incised rocking motifs, rocking comb impressions on the body or the neck is not rare. On the other hand quite a few novelties have developed: bilobate pots and a more frequent use of incised and grooved decoration. The organisation of the motifs is also different: they now seem limited to the neck and upper part of the body, and a partition of the decorated space is evidenced. The lithic component does not differ from LSA artefacts. It is possible – as LSA levels are present in the clay mantle – that the flints are of LSA date, dumped on the surface while the pits were dug and then re-incorporated in the fillings.

Further inland, neolithic traces, apart from the surface-collected polished tools, are scanty. On top of Mount Brazza in Ogooué Ivindo province a refuse pit with a very peculiar and previously unknown type of pottery associated with quartzite and quartz debitage, and with upper and lower grindstones of quartzite, has been dated to 3560 bp [19]. There is a double inconsistency. First and foremost the laboratory itself has expressed doubts regarding the accuracy of [19] (E. Gilot *in litt.* 1986). Also the pit opens from the surface; a deposit of atypical potsherds, buried 40 cm deep several metres away, although on stratigraphical

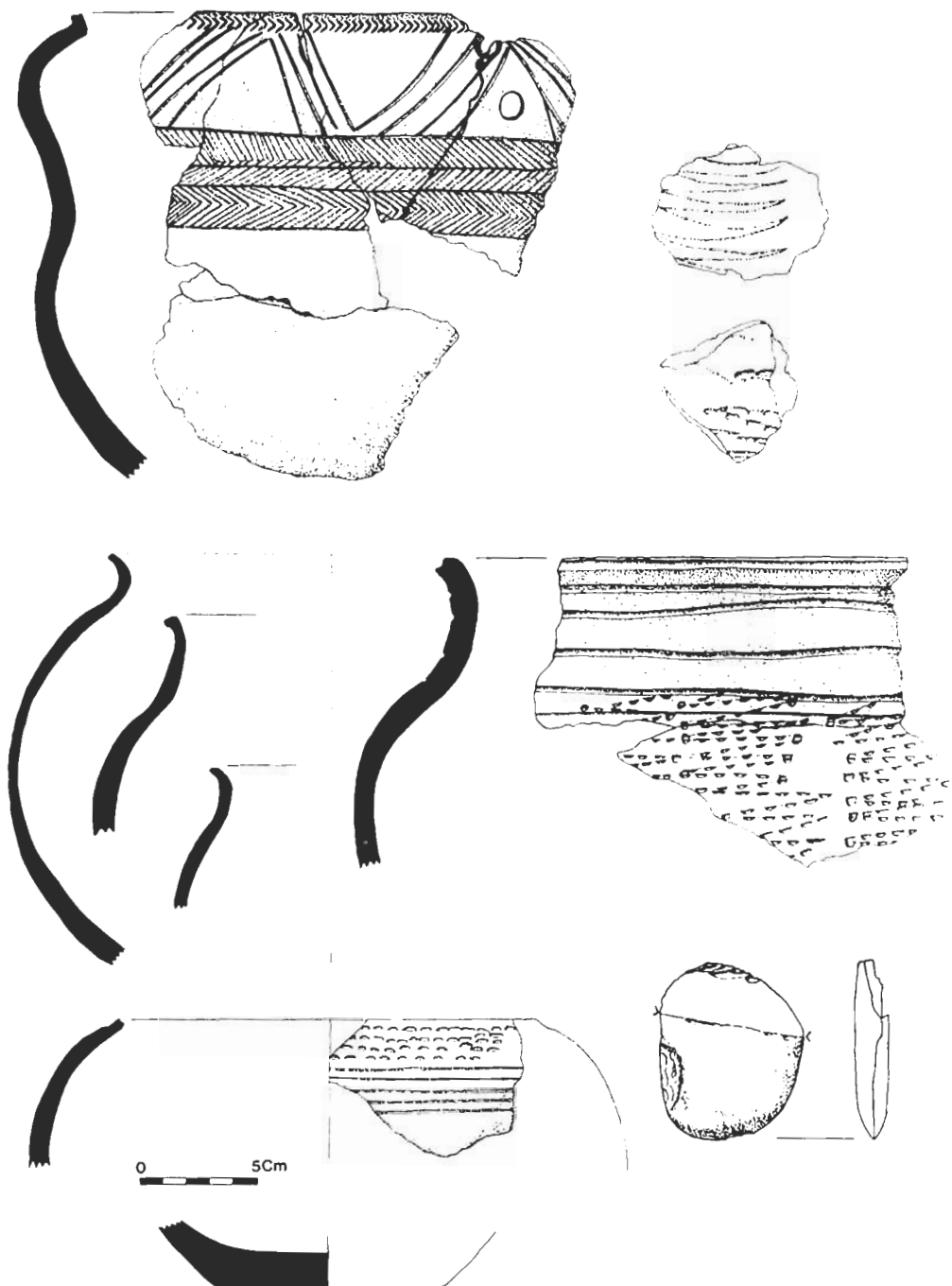


Figure 10 Neolithic pots and polished stone axe of the Okala Tradition from the Okala site.

grounds earlier than this pit, has yielded a date which is much younger: 2130 bp [39] (Oslisly 1986). We are inclined not to use the doubtful earlier result in the discussion which follows.

A refuse pit at the Lopé 12 site near the Ogooué contained potsherds identical with the neolithic ware at Okala on the coast, 250 km away; a fragment of polished axe was also recovered in the pit. A 14C date of 2280 bp was obtained [31] (Oslisly and Peyrot 1988).

A fragment of a polished axe in green schist has been found embedded in the clay shaft of an iron furnace at the Otoumbi 4 site in Ogooué-Ivindo province. Charcoal from the furnace itself is dated to 1980 bp [56]. It is consistent with other early evidence for iron working from the area (see below). This date can be considered to be a *terminus ante quem* for the use of polished tools in the central savannas of Gabon (Oslisly 1986).

Discussion

Elsewhere in Central Africa only four neolithic – or putatively neolithic – traditions are recognised: Obobogo in southern Cameroon, Imbonga in Zaïre's Equator region, Ngovo in Lower Zaïre and Batalimo/Maluba in Zaïre and Centrafrique. To this list could be added the Bouar megalithic 'civilisation' of Centrafrique, although its settlements are still unknown. We shall therefore limit ourselves to the discussion of the first four industries.

The Obobogo tradition in Cameroon is the northernmost and the earliest. Obobogo is only one of several sites around Yaoundé (Maret *et al.* 1983). The assemblage includes polished axes and adzes, upper and lower grinding stones, grooved stones, palm nuts, charcoal, ceramics and a few pieces of quartz debitage. All the material was recovered in large refuse pits (Claes 1985; Maret *in press* b and c) dating from *ca* 1000–600 bc (Maret 1982a, 1985b). The ceramics are very distinctive: open and closed vessel forms are present, the same type of design organisation being used for pots and bowls alike. Three different modes are present:

- covering, from lip to bottom, by various combinations of incised herringbone, chevrons, impressed rocking comb or rocked incisions; sometimes the upper part of the neck is left undecorated.
- partial bipartition, the neck – the first partition of the design structure – is decorated by horizontal incisions, impressions or rocked incisions. Immediately below the neck starts the second partition with covering motifs which extend down the body to the bottom.
- bipartition, the neck and shoulder is decorated in an areal manner with one motif. Then, either directly or separated by horizontal incisions or impressions, another type of motif, such as grouped vertical incisions, covers the body.

Bottoms are usually flat and sometimes decorated with zig-zag incisions. Vertically placed ears for prehension are also present on a few vessels. Lips of pots and bowls are either grooved or rounded.

If we now turn to M. Eggert's work in Equator region in Zaïre, a different picture emerges: two quite distinct industries or horizons, Imbonga and Batalimo/Maluba, have been described.

The Imbonga horizon is limited to the banks of the rivers Ruki, Ikelmba, Lulonga, Momboyo and also to the left bank of the Zaïre river around Mbandaka. Eggert (1987:133) feels that this industry may be dated to the second half of the first millenium bc. The pots and bowls of the Imbonga horizon have flat bases decorated by impressions and rocked incisions

(Eggert 1987: fig. 15). The surface of vessels (Eggert) are decorated according to a bipartite system. The neck, shoulder and upper part of the body received an incised, impressed decoration to which were added decorated micro-coils. The body or its lower-part was covered with a characteristic impressed rocking-comb motif which is also present at Obobogo and on the Gabonese coast, though used in a different way. The internal part of the lip can be decorated by horizontal bands (Eggert 1983: figs. 13–15). Stone working is not attested. M. Eggert (1987:131) states 'although we excavated a fair number of Imbonga settlement deposits and other features we never encountered artefacts other than pottery. It seems obvious, however, that the conspicuous absence of worked stone does not adequately reflect the cultural make-up of this earliest phase of pottery-related equatorial settlement history'.

Further to the north, along the Ubangui river between Mbandaka and Bangui, Maluba ware is found, akin to the Batalimo assemblage (Bayle des Hermens 1975; Eggert 1987). Dates range from 2140 to 1570 bp. The pots and bowls found at Dongo and at Maluba do not differ much from ones found at Batalimo in Centrafrique (see Aumassip 1975: figs. 101–3; Eggert 1987: figs. 6, 9–11). The organisation of designs on the vessels extends from the lip to the upper part of the body. Rocked impressions or incisions are unknown. The pot from Dongo with zig-zag incisions on the body comes from the surface of the site (Eggert 1987: fig. 6). The organisation of designs and the motifs used to fill decorative space are very distinct from Imbonga ware.

Finally, in Lower Zaïre the Ngovo Industry is represented at open-air and cave sites between the Zaïre river and the Angolan border. The assemblages are made up of a very distinctive ware, grooved stones, polished axes and adzes, a poor lithic debitage. Dates on four sites' samples range from 2200 to 1900 bp (Maret 1986). The Ngovo group includes pots and some rare bowls; usually lips are rounded, the bottoms are flat. Decoration is composed of grooves and incisions made with a stick. The designs' organisation is based on the vertical succession of bands or zones from the neck to the upper part of the body. Sometimes these bands cover the entire body. Incision was used to create geometric designs comprising triangles, herringbones, zig-zags and criss-cross patterns (Clist 1982; Maret 1986). Again, the design organisation on Ngovo ware cannot be used to link it to other known neolithic groups in Central Africa.

From the above it is clear that the various neolithic groups from 2500 bp were isolated from each other. Systemic analysis (Clist 1988) shows the Okala, Ngovo and Imbonga traditions not to be directly related. On the other hand some common elements, such as rocking comb impressions, zig-zag incisions and impressed designs on the flat bottoms, point to a common ancestry.

It may be suggested that such an ancestral ware is already known in the archaeological record: the Obobogo and river Denis and related sites from Cameroon and Gabon. Dated in Cameroon to *ca* 3000 bp and in Gabon to *ca* 5000–3500 bp, they share all the above-mentioned common elements of later neolithic wares and also share what appears to be the simplest decorative system from which the others could have developed: an areal, usually impressed, system with bases similarly decorated.

If we associate these neolithic expressions to human migrations, the new evidence enables us to postulate a slow migration of peoples, perhaps Bantu-speaking, through the evergreen forest and along the coast. If further research in Lower Zaïre shows the Ngovo Industry to be indeed the first such group south of the forest, then the rate of expansion must have been *ca* 1.2 kilometres a year. This agrees well with other models of similar small migrating groups (e.g. Van Bakel 1981; Collett 1982).

The Early Iron Age in Gabon

After *ca* 2500 bp, we find a neolithic tradition alive on the coast and, inland, areas where iron metallurgy was practised on a wide basis, as in Woleu-Ntem province in the north and in Haut-Ogooué province in the south-east (Fig. 11).

In Woleu-Ntem the Oyem 2 site was excavated in 1985. There, two pits dated to 2220 bp [45] and to 2280 bp [44] had iron slag in their filling (Clist 1987b, *in press* b). Detailed analysis of the material shows that the dates are acceptable. Iron slag, sherds with rocking incised motifs, together with burned clay pieces were recovered mixed in the pits (Fig. 12). This early date for iron metallurgy also illustrates when, at the latest, villages were established deep in the equatorial forest (Clist *in press* b).

Similar material has been excavated by Omar Bongo University in Haut-Ogooué at Moanda. Several iron furnaces and related structures were dated to 2330 bp [43] and 2220 bp [46] at the Moanda II site, separated by 200 m from the Moanda I site dated to 2350 bp [42] (Schmidt *et al.* 1985; Digombe *et al.* 1987e). Thus iron smelting at Moanda started around 2350–2300 bp.

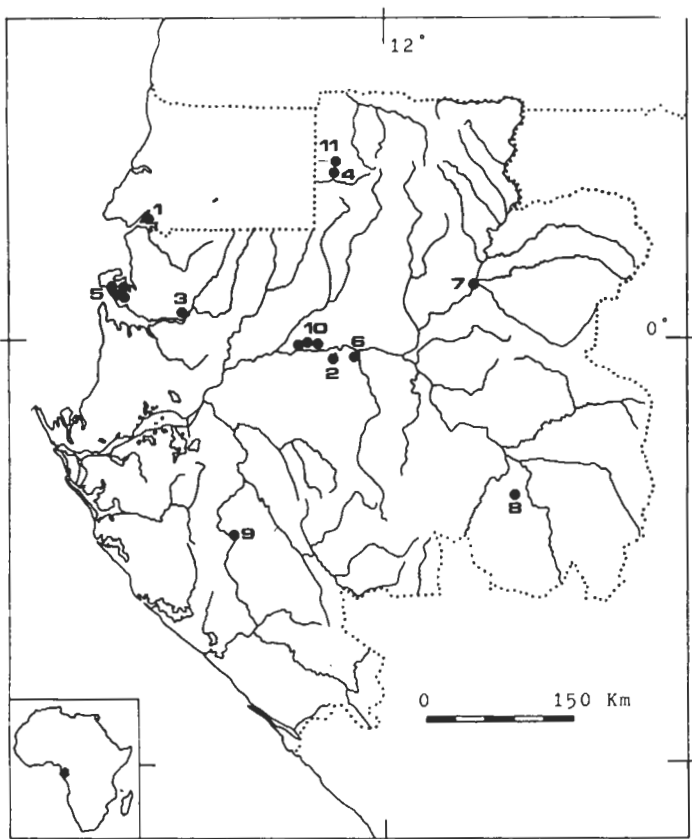


Figure 11 Location map of Early and Late Iron Age sites in Gabon. 1: Ayene, 2: Elarmekora, 3: Kango, 4: Koualessis, 5: Libreville (Bisségué, Charbonnages, Nzogobeyok, Oveng), 6: Lopé, 7: Makokou, 8: Moanda, 9: Mouila, 10: Otoumbi 2, 5 and 8, 11: Oyem.

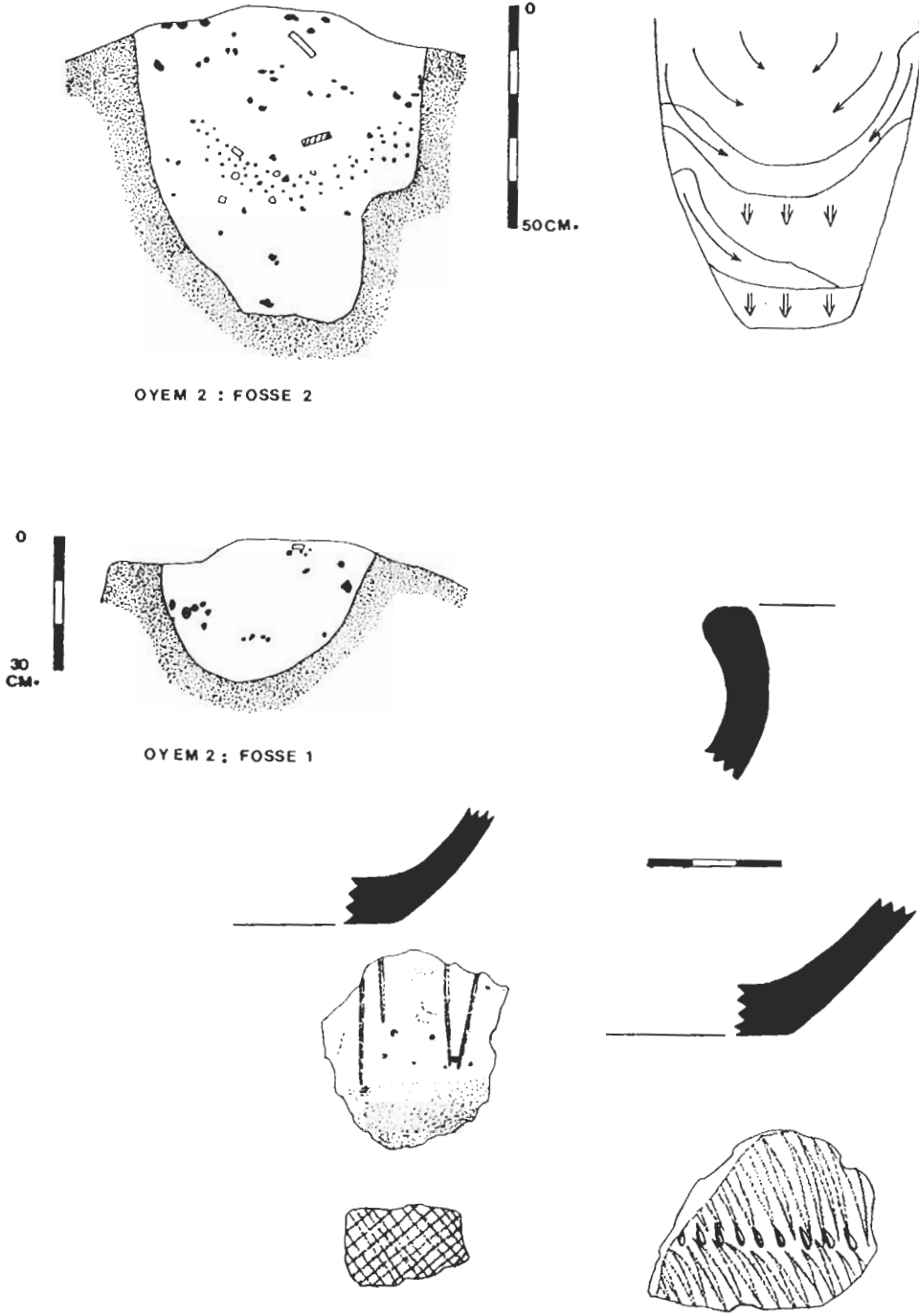


Figure 12 Stratigraphy of the Oyem 2 Early Iron Age site: pits and associated potsherds.

By taking into account the standard errors from Oyem and from Moanda we can suggest that these two early occurrences of iron smelting were broadly synchronous. There is a strong possibility that iron smelting was introduced into Haut-Ogooué from the east, from the savanna areas of Congo, and was rapidly diffused across Gabon by way of the Ogooué river system.

Other dates, only slightly later, show the rapidity of the adoption of this technology: Makokou in Ogooué-Ivindo province, 2150 bp [50] (Peyrot and Oslisly 1987:15); Mouila in Ngounié province, 2150 bp [47] (Schmidt *et al.* 1985); and Lopé 4 in Ogooué-Ivindo province, 2130 bp [52] (Peyrot and Oslisly 1987:14). In the savannas of Moyen-Ogooué and Ogooué-Ivindo provinces it is possible that iron smelting was also early. Two 14C dates have been processed from the same furnace at Otoumbi 2: 2400 bp [41] and 2640 bp [40].

It seems that what has been termed the Okanda Group (Oslisly 1986) is now dated to the second century ad [69] (Oslisly and Peyrot 1988). The pottery is quite characteristic, four sites yielding this ceramic having been identified. The distribution extends along the Ogooué for 80 km. The pots have lugs decorated by criss-cross incisions, and incised circles under the lugs.

Later, what has been called the Otoumbi Group, after the Otoumbi 5 site (Oslisly 1986), appears in the western part of the middle reaches of the Ogooué river. Four 14C dates have been processed from samples collected in refuse pits at Otoumbi 5 in which iron slag was mixed with identical ceramics [38, 64, 74, 80]. We are inclined to reject the two earliest dates, and to place Otoumbi 5 in the Early Iron Age around 1700–1600 bp. This chronology is further strengthened by a date of 1640 bp [79] obtained at the Otoumbi 8 site a few kilometres away with similar ceramics (Oslisly and Peyrot 1988). The Otoumbi Group is characterised by pots with everted incised rims and rocking incisions on the neck and shoulder.

It seems likely that the Ogooué river, which crosses the savannas of Lopé and Otoumbi, was a major migration and diffusion axis. It is not therefore surprising to find quite early iron-smelting in this area.

We have shown elsewhere (Clist *in press b*) that the Gabonese Early Iron Age smelting sites share all or some of the characteristics listed below:

- pit furnaces to the walls of which clay was added: after smelting this clay forms a kind of brick.
- tewels coming into the centre of the furnace: slag remains are formed on the tewels' inner part.
- no trace of a reception pit for liquid iron.
- a clay shaft or chimney is sometimes attested, with wood branches indicated by their impressions. The shaft must have thus been mounted on a wooden framework.

At Koualessis near Oyem an iron-smelting site dated to the first century bc had pits 0.75–0.90 m in diameter and 0.25–1.14 m deep (Clist 1987b).

On the coast, previously published 14C results [22, 32] from Kango 5 in Estuaire province (Clist *et al.* 1986) are now known to relate to the neolithic (see above). The only early date on the coast is the one from 'Sablières' (Nzogobeyok), where charcoal associated with iron slag and some lithic débitage was dated to 2490 bp [36]. The slag, however, could have descended from some upper levels through the sandy mantle (Clist *et al.* 1986). So far the earliest iron-associated date in Estuaire is from pit 6 at Kango 5, 91 km south-east of Libreville. There,

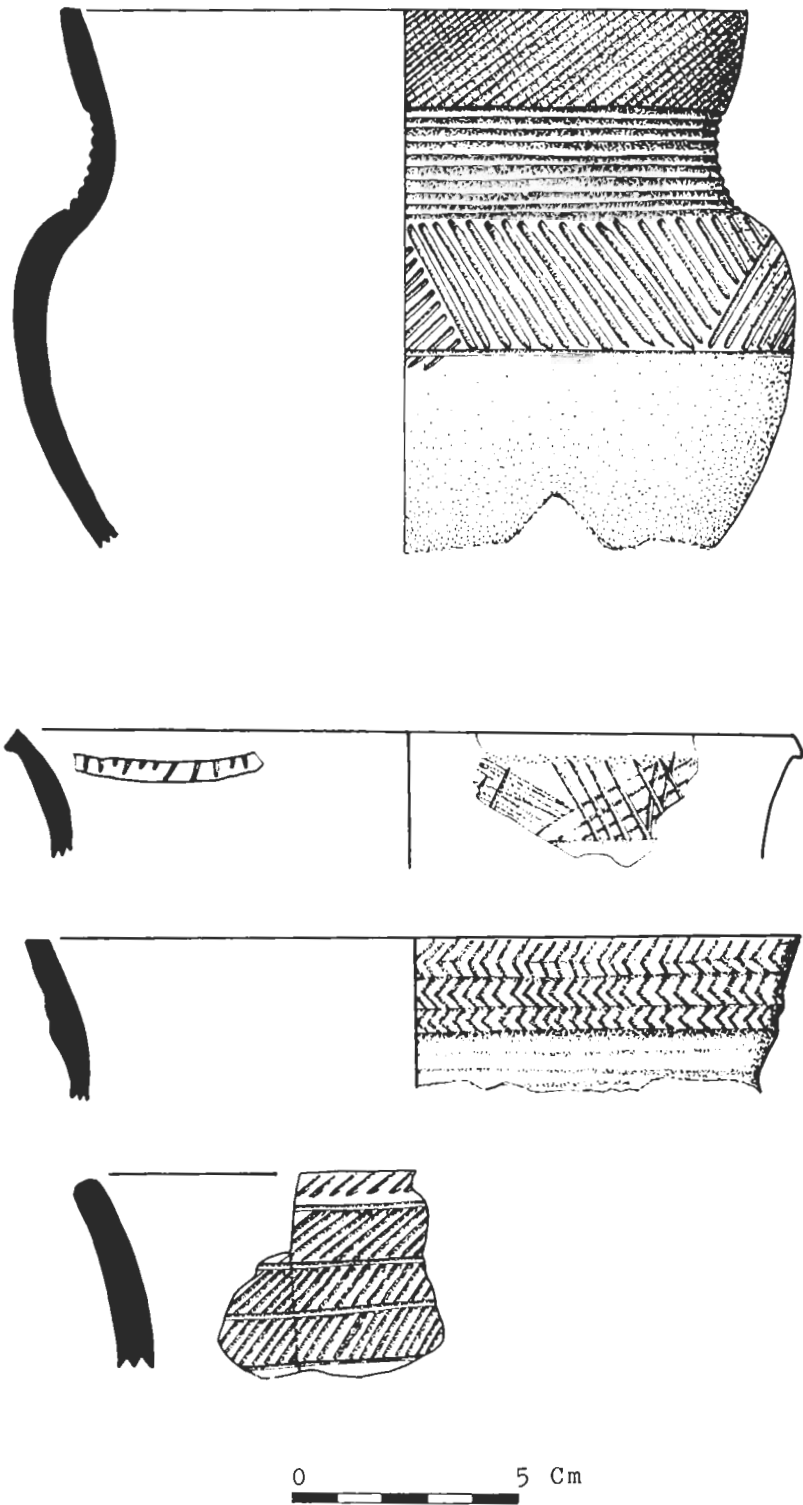


Figure 13 Early Iron Age pots from Kafélé.

iron slag and iron objects were dated to 1900 bp [63]. This agrees well with the dating of neolithic sites a few centuries earlier and with the dating of the Oveng shell-midden.

The Okala Tradition ware has been briefly described above. The EIA groups like the Oveng in Estuaire province, and the Okanda and Otoumbi Traditions in Moyen-Ogooué and Ogooué-Ivindo provinces, differ significantly both from their neolithic predecessors and among themselves. Though the same pots are present, and a few EIA forms of the Oveng Tradition recall the earlier bilobate pots, it is only during the EIA that prehension devices appear: lugs of various types are known in the Oveng and Okanda Traditions. Some of these are decorated by incised motifs. The differences are particularly evident in the decoration motifs and their organisation. Rocking impressions and incisions become rare; chevrons and herring-bone motifs are widely used. What is striking is the common use of punctates and horizontal incisions to divide the decoration units on the neck, shoulder and upper part of the body (Fig. 13). The neolithic decorated bases disappear entirely. The horizontal partitioning of the EIA vessels, which also appeared on the neolithic bilobate pots, is now widespread. Incised motifs extend to the lips of the pots. The Okanda Tradition is distinguished by its circular incisions placed, single or grouped, under or near to the lugs. Finally, the EIA also sees the wide use of relief decoration of appliqué buttons.

The only close parallels to the iron furnaces of Gabon are from the interlacustrine area, 1750 km away to the east. Some researchers have already suggested a direct link between the two areas (Digombe *et al.* 1987e). We must be more cautious. Four aspects may be discussed in order to evaluate the possible connexion: chronology, ceramics, ecology, and furnace technology.

We have shown elsewhere that the Urewe Industry of the interlacustrine region lasted from 2500 to 1300 bp (Clist 1987e). The early 2500 bp dates for iron smelting come from Gasiza I in Rwanda, Mirama III in Burundi and Katuruka in Tanzania (Clist 1987e). The earliest dates from Gabon are around 2350 bp, only some 150 years later, without even considering the standard errors of these dates which would close the gap. It is during these 150 years that the technology must have crossed 1750 km of rain forest, according to Digombe *et al.* (1987e). One of the major axes for crossing the forest is along the Ubangui and Zaïre rivers. This extends the distance to be covered to *ca* 2900 and 2400 km respectively.

Turning to ceramics it is indeed curious that Eggert (1987) has never found any trace of iron or of pottery even remotely related to Urewe ware along the Zaïre or the Ubangui. De Bayle des Hermens (1975) has shown – and it has been recently confirmed by Vidal (*in press*) – that the Batalimo inhabitants around the fourth century ad still knapped and polished stone and did not use iron. The evidence found by de Bayle des Hermens and by Eggert is strongly against a riverine contact between Gabon and the Interlacustrine area.

In the savannas of Lower Zaïre iron is not known before *ca* 1900–1800 bp (Maret 1986). The Kay Ladio group which used iron at that time seems to be a local development from the former Ngovo group (Clist 1982; Maret 1986). The good knowledge which we have of ceramic groups in this area make one doubt whether iron could have been transmitted to Haut-Ogooué through the southern savannas.

These observations about chronology, ceramics and ecology, taken together, are enough to raise doubts concerning a direct East Africa–West Central Africa contact to explain the introduction of iron metallurgy to Gabon. As suggested in a recent paper (Clist 1987e), we need detailed site reports as well as a thorough analysis of the accuracy of the 14C dates.

It follows that discussion about the origin of iron metallurgy in Central Africa is today premature. We can only say that our present data suggest the possibility of a north-south diffusion of the technology from the northern savannas.

Later in the Early Iron Age, coastal villagers turned to estuarine and mangrove resources. Shell middens are now found on hill tops along the coast of Estuaire province, the earliest so far being the Oveng shell midden 10 km north-east of Libreville. The site is dated [57, 71, 78] to the third/fourth centuries ad (Clist 1987b:10). Shells of *Anadara senilis*, *Tympanotonus fuscatus*, *T. radula*, *Ostrea tulipa* and *Semifusus morio* were mixed with fish bones; a few mammal bones, including human ones, were also recovered by wet screening. Today, 17 shell middens are known in the Libreville area. The latest is the 'Charbonnages' midden, dated to the fourteenth century ad (*ibid.*). This kind of evidence shows that the local economy from ca 1700 bp onwards was dependent on coastal resources which supplemented the dietary intake of collecting and hunting in the forest. Furthermore it shows the importance of studying shell middens since bone is there preserved in soils whose natural acidity is countered by the shells' carbonate leaching. The only other place where we can hope to find bone evidence is in cave and rock-shelters, which remain poorly known.

At Nzogobeyok, north of Libreville, several groups of intact ceramics were found with an iron blade-fragment at the same depth of 0.8 m. A nearby charcoal sample was dated to 1150 bp [87]. This buried grouping of intact vessels strongly suggests a grave deposit (Clist *et al.* 1988). The ceramics show common traits with Late Carboneras vessels from Bioko Island.

The Late Iron Age in Gabon

We group arbitrarily in a Late Iron Age (LIA) all sites dated after ad 1000. Sites of this period have never been studied for their own sake except for one project relating to iron smelting in Woleu-Ntem province (Clist 1987a). Elsewhere in the country LIA evidence has been recorded while excavating or surveying EIA or neolithic settlements. Dated sites are found in all provinces (Schmidt *et al.* 1985; Digombe *et al.* 1987e; Peyrot and Oslisly 1985; Clist 1987b). Only a few and very limited sequences are starting to emerge. It is thus still too early to attempt a synthesis of LIA data. It is possible that the limit between the Late and the Early Iron Ages – arbitrarily put at 950 bp – will be somewhat changed in the near future through research specifically devoted to the Late Iron Age sequence. We will here limit ourselves to two topics of major interest: the use of roulettes and evidence for European trade on the coast.

Both wooden and cord roulettes were used to decorate LIA pottery. Wooden roulettes are so far limited to the coast north of the Ogooué river: sherds with characteristic motifs (Fig. 14) are found at the 'Charbonnages' site and at Ayene on the Equatorial Guineean bank of the Rio Muni. Though surface-collected, these sherds can be related to two archaeological levels dated ca 800–600 bp (Clist 1987b) [93, 98]. The sherds at Ayene are directly in association with shells dated ca 600 bp (Clist 1987f).

Along the Ogooué river in the savannas between Otoumbi and Lopé in the Booué depression knotted strip roulettes were widely used, similar to those published by Soper (1985:fig. 5). At the Lopé 5 site a date was processed from a charcoal sample collected at 10 cm depth with sherds and grinding stones: 660±80 bp [96] (Oslisly 1986:97). At the Otoumbi 10 site knotted strip roulette decorated ceramics, associated with a *pierre à cupule*



Figure 14 Roulette-decorated Late Iron Age sherds.

have been dated as modern [115]. The occurrence of carved and knotted roulettes in Gabon contrasts with their apparent association elsewhere in Central Africa with Ubanguian-speakers (see David and Vidal 1977; Soper 1985).

European trade is evidenced on the Gabonese coast at several hill-top sites where numerous European glazed vessels, glass beads and white clay smoking pipes are exposed on the surface. The best such site so far studied is Bisségué hill in the Libreville suburbs, 6 km east of the city centre. There, both the smoking pipes, made in England and the Netherlands, and the glass beads indicate a date between AD 1740 and 1850 (Fig. 15).

Rock art in Gabon

In 1981 P. Oberson discovered near the small village of Elarmekora in Ogooué-Ivindo province an open-air rock art site, comprising rock peckings on large schist slabs. The figures (Fig. 16) consist of thousands of small peckings made with an iron tool, and they represent either geometrical figures including circles, triangles, etc. or zoomorphic designs such as fish and lizards (Oslisly 1987; Oslisly and Peyrot 1987). The technique used shows clearly that the art is of Iron Age date.

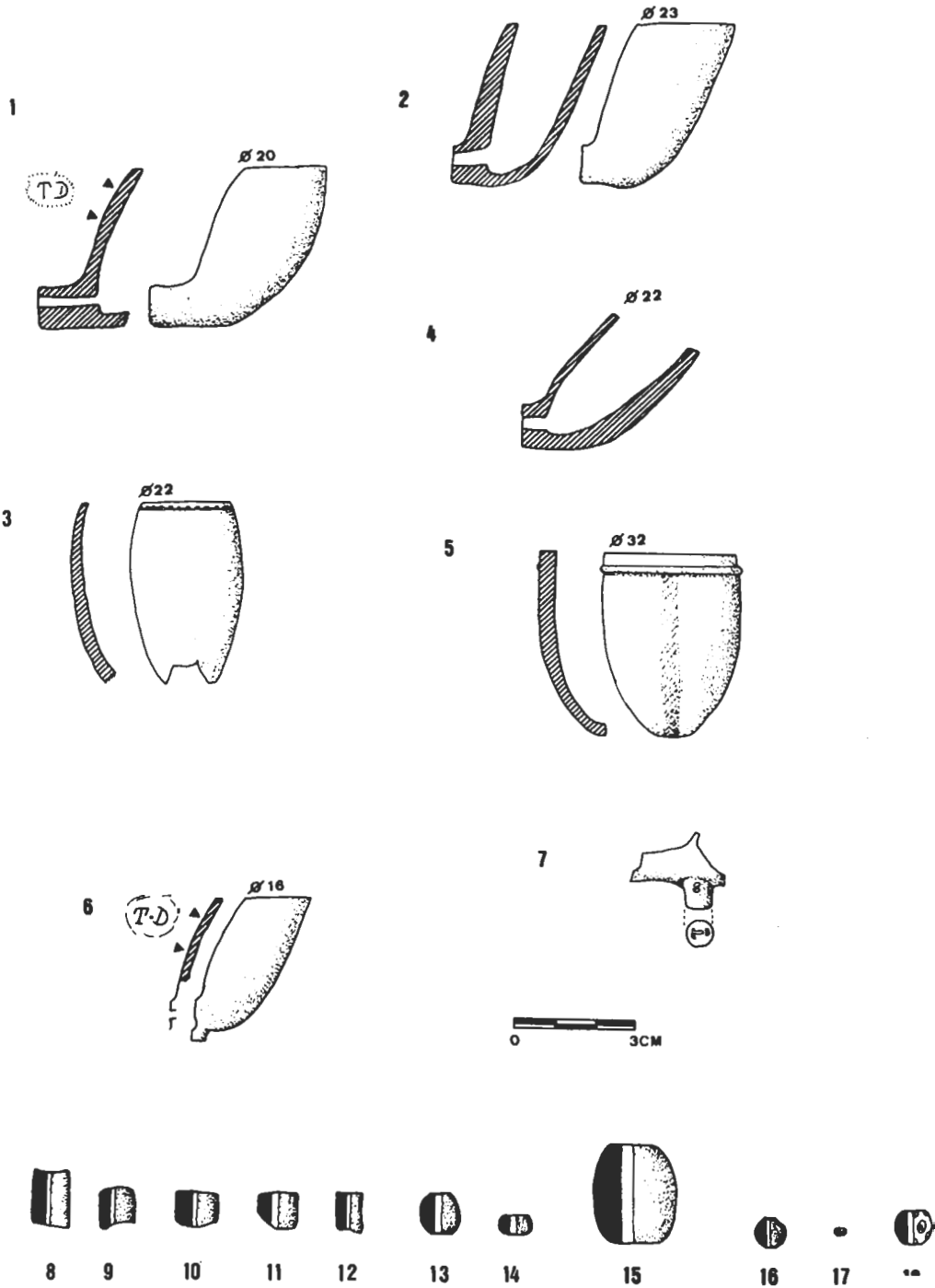


Figure 15 European-made smoking pipes and beads from Bisségué.



Figure 16 Rock engravings from the Elarmekora Iron Age site.

Comparison with rock art elsewhere in Central Africa shows it to be most similar to that in Centrafrique which also has pecked geometric designs on large open-air floors of laterite (Bayle des Hermens 1975). Rock art in Equatorial Guinea and in Congo is quite different. The rock art of Gabon may be attributed to the later stages of the Iron Age. It is possible that further rock-art sites will be discovered in the near future in Gabon. Some reports exist about figures of daggers in caves around Lastourville (Alimen 1955; see also De Beauchene 1963:14).

General discussion

Though intensive archaeology only started in Gabon in 1981–2, enough is known today to enable us to group artefacts found during fieldwork in defined and datable cultural units and to question several seminal aspects of regional history.

The earliest occupation is represented by knapped tools found in stone-lines. The peoples responsible for these industries were not hampered by the evergreen forest as it was a dry phase during which forest regressed. Open forest savanna must have been widespread; it follows that the tool-kit was not adapted to forest conditions. It is possible that these industries should be attributed to the MSA. From *ca* 40,000 bp we have only the Ndjolé site where MSA Lupemban-like implements have been discovered. Surface sites with such tools are widespread in Gabon. Here again, the hunter-collectors lived in an open savanna

environment during the Leopoldvillian dry phase, which explains why beneath the present forest similar artefacts are found buried in the clay colluvium.

In eastern Central Africa true LSA industries are present from *ca* 24,000 bp. In Gabon, however, the earliest date is much younger, *ca* 8000 bp. These LSA peoples had to find their subsistence in a forest environment, similar to today's, with the regression of the savanna lands during the Kibangian wet phase. It is possible to correlate late LSA stone tools with the presence of pygmies adapted to forest conditions.

Around 3000 bp linguists tell us that the first proto-Bantu speakers spread from Nigeria and Cameroon both eastwards and south-eastwards (Ehret 1982; Heine 1984; Vansina 1984). They may have been present in the Interlacustrine area *ca* 2500 bp. We consider that the first neolithic villages we have excavated on the Gabonese coast around Libreville dated to 2400–2200 bp may have been inhabited by Bantu-speaking groups. The linguistic map of Central Africa shows both Bantu-speaking and pygmy communities. It has been common to contrast the pygmy hunter-collectors with the Bantu-speaking semi-sedentaries. Linguists through glotto-chronology and comparative studies are able to show a north-south movement of Bantu speech (Bastin *et al.* 1983; Coupez *in press*) resulting from human migrations: 'we may assume that the expansion was accompanied by migrations of at least small numbers of people' (Vansina 1984:133). If further research backs up our early dates and evidence for village-settlements on the Gabon coast *ca* 4000 bp in the same area, we may have to re-estimate the time of the early Bantu migrations. The early Obobogo inhabitants thus may not have been the earliest in south Cameroon: other still earlier villages may be found there and on the coast between Kribi and Douala. It was shown above that the neolithic migrations were slow: 1.2 km a year.

On the coast of Gabon the neolithic settlers seem to have followed the coastal savannas extending from Cameroon to Gabon. From there they may have travelled up the Ogooué river and to the central savannas to settle central Gabon. Deforestation must have been limited to small fields around the villages proper. The scheme Vansina (1984) has published is compatible with ours, if we see the Ogowé-Estuary language group (his stages 4i and 4ii) developing during neolithic times and then splitting up between a Myene group and a Tsogo group late in the neolithic or early in the Iron Age. These then moved to the Ogowé delta (Myéné) and to the south of the river towards Mouila (Tsogo). This would also explain why the EIA ware in the Estuaire province is so different from neolithic vessels and from its contemporary Okanda and Otoumbi industries on the Ogooué to the east: cultural boundaries are then much more clearly defined and industries are more restricted in extension.

Later, *ca* 2350 bp, iron was introduced to Haut-Ogooué in eastern Gabon. It then spread downstream towards the coast where it was accepted *ca* 1900 bp by the former neolithic people. The first secondary forest patches must have been formed at that time, after deforestation caused by charcoal production for use in iron smelting. Iron metallurgy was rapidly introduced to various regions: in only 500 years iron was smelted from southern Cameroon to Lower Zaïre, which gives a rate of spread of 2.4 km a year, twice the rate for the neolithic advance. It is also interesting to note the irregular rate of iron diffusion: while it took perhaps 100–150 years to expand through Gabon, to diffuse to the shores of the Zaïre river took another 300 years.

For our model to be fully acceptable, we should be able to compare it with similar ones

from neighbouring countries. In Cameroon only the neolithic sequence can be compared with the Gabonese one. In Congo, especially in the north, no comparable data are available. This further underlines the preliminary nature of the sequence presented here.

References

- Alimen, A. 1955. *Préhistoire de l'Afrique*. Paris: N. Boubée.
- Asombang, R. *in press*. Mbi Crater rockshelter: evidence from mammalian fauna. *Proceedings of the International Symposium on Archaeology in Cameroon, 6-9 January 1986*.
- Aumassip, G. 1975. La poterie de Batalimo. In *Recherches préhistoriques en République Centrafricaine* (by R. Bayle des Hermens): pp. 221-33. Paris: Klincksieck.
- Bastin, Y., Coupez, A. and de Halleux, B. 1983. Classification lexicostatistique des langues bantoues (214 relevés). *Bulletin des Séances de l'Académie royale des Sciences d'Outre-mer* 27,2:173-99.
- Bayle des Hermens, R. 1975. *Recherches préhistoriques en République Centrafricaine*. Paris: Klincksieck.
- Bayle des Hermens, R., Clist, B., Oslisly, R. and Peyrot, B. 1987. Premières séries de pierres taillées du Paléolithique Inférieur découvertes au Gabon. *Afrique Centrale*. *L'A.* 91,2:693-8.
- Bayle des Hermens, R., Lanfranchi, R. and Peyrot, B. 1980. Préacheuléen découvert dans des lignes de cailloux en République Populaire du Congo. *L'A.* 84,1:5-21.
- Biberson, P. 1966. *Galets aménagés du Maghreb et du Sahara*. Paris: Musée National d'Histoire Naturelle.
- Blankoff, B. 1965. Quelques découvertes préhistoriques récentes au Gabon. *P.A.C.* 5:191-206.
- Blankoff, B. 1969. L'état des recherches préhistoriques au Gabon. *Actes du premier Colloque International d'Archéologie africaine, Fort-Lamy 1966*: pp. 62-80. Fort Lamy: Institut National Tchadien pour les Sciences Humaines.
- Brooks, A. S. and Smith, C. C. 1987. Ishango revisited: new age determinations and cultural interpretations. *A.A.R.* 5: 65-78.
- Cahen, D. 1975. *Le site archéologique de la Kamoa (région du Shaba, République du Zaïre) de l'âge de la pierre ancienne à l'âge du fer*. Tervuren: Musée Royal de l'Afrique Centrale.
- Cahen, D. 1976. Nouvelles fouilles à la pointe de la Gombe (ex pointe de Kalina), Kinshasa, Zaïre. *L'A.* 80,4:573-602.
- Cahen, D. 1978a. Gabon. *N.A.* 12:23-4.
- Cahen, D. 1978b. Vers une révision de la nomenclature des industries préhistoriques de l'Afrique Centrale. *L'A.* 82,1:5-36.
- Cahen, D. 1982. The stone age in the south and west. In *The Archaeology of Central Africa* (ed. F. Van Noten): 41-56. Graz: Akademische Druck und Verlagsanstalt.
- Cahen, D., Moeyersons, J. and Mook, W. G. 1983. Radiocarbon dates from Gombe Point (Kinshasa, Zaïre) and their implications. In *Proceedings of the first International Symposium on ¹⁴C and Archaeology, Groningen 1981* (eds. W. G. Mook and H. T. Waterbolk): pp. 441-52. Strasbourg: Conseil de l'Europe.
- Calvocoressi, D. and David, N. 1979. A new survey of radiocarbon and thermoluminescence dates for West Africa. *J.A.H.* 20:1-29.
- Caratini, C. and Giresse, P. 1979. Contribution palynologique à la connaissance des environnements continentaux et marins du Congo à la fin du Quaternaire. *Compte-rendus de l'Académie des Sciences de Paris*, série D 288:379-82.
- Claes, P. 1985. *Contribution à l'étude de céramiques anciennes des environs de Yaoundé*. M. A. thesis, Brussels Free University.
- Clark, J. D. 1963. *Prehistoric Cultures of Northeast Angola and their Significance in Tropical Africa*. Lisbon: Diamang.
- Clark, J. D. and Van Zinderen Bakker, E. M. 1962. Pleistocene climates and cultures in north-eastern Angola. *Nature* 196:639-42.

- Clist, B. 1982. *Etude archéologique du matériel de la mission Maurits Bequaert de 1950-1952 au Bas-Zaïre*. M. A. thesis, Brussels Free University.
- Clist, B. 1986. Le néolithique en Afrique Centrale: état de la question et perspectives d'avenir. *L'A.* 90,2:217-32.
- Clist, B. 1987a. 1985: fieldwork in Gabon. *N.A.* 28:6-9.
- Clist, B. 1987b. Travaux archéologiques récents en République du Gabon 1985-1986. *Nsi* 1:9-12.
- Clist, B. 1987c. Early Bantu settlements in west-central Africa: a review of recent research. *C.A.* 28,3:380-2.
- Clist, B. 1987d. La fin de l'âge de la pierre et les débuts de la métallurgie du fer au Gabon: résultats préliminaires 1986-1987. *Nsi* 2:24-8.
- Clist, B. 1987e. A critical reappraisal of the chronological framework of the Early Iron Age Urewe industry. *Muntu* 6:35-62.
- Clist, B. 1987f. Recherches archéologiques en Guinée Equatoriale, 1985. *Nsi* 1:16-17.
- Clist, B. 1988. Un nouvel ensemble néolithique en Afrique Centrale: le Groupe d'Okala au Gabon. *Nsi* 3:43-51.
- Clist, B. *in press* a. Des derniers chasseurs aux premiers métallurgistes: sédentarisation et débuts de la métallurgie du fer (Cameroun, Guinée Equatoriale, Gabon). In *Les paysages: leur évolution, leur occupation au quaternaire en Afrique Centrale occidentale* (eds. D. Schwartz and R. Lanfranchi). Paris: ORSTOM.
- Clist, B. *in press* b. Les plus anciennes traces de fonte du fer en forêt équatoriale au Gabon. *B.S.P.F.*
- Clist, B. and Lanfranchi, R. 1988. Le gisement âge de la pierre récent de Nzogobeyok, Gabon: fouille 1987. *Nsi* 4:21-7.
- Clist, B., Oslisly, R. and Peyrot, B. 1986. La métallurgie ancienne du fer au Gabon: premiers éléments de synthèse. *Muntu* 4-5:47-55.
- Clist, B., Peyrot, B. and Oslisly, R. 1988. Les 'Sablières' de Libreville: étude géomorphologique et archéologique d'un site préhistorique de l'Estuaire du Gabon. *L'A.* 92, 4.
- Collett, D. 1982. Models of the spread of the Early Iron Age. In *The Archaeological and Linguistic Reconstruction of African History* (eds. C. Ehret and M. Posnansky): pp. 182-98. Berkeley: University of California Press.
- Coupez, A. *in press*. Lexicostatistique bantoue: état de la question. *Actes du Colloque International du CICIBA, 1-6 Avril 1985*.
- David, N. 1982. Tazunu: megalithic monuments of Central Africa. *Azania* 17:43-77.
- David, N. and Vidal, P. 1977. The Nana-Mode village site (sous-préfecture de Bouar, Central African Republic) and the prehistory of the Ubanguian-speaking peoples. *W.A.J.A.* 7:17-56.
- De Beauchene, G. 1963. La préhistoire au Gabon. *Objets et Mondes* 3, 1:3-16.
- Delibrias, G., Giresse, P. and Kouyoumontzakis, G. 1973. Géochronologie des divers stades de la transgression Holocène au large du Congo. *Compte-rendus de l'Académie des Sciences de Paris, série D.* 276:1389-91.
- De Ploey, J. 1963. *Quelques indices sur l'évolution morphologique et paléoclimatique des environs du Stanley-Pool (Congo)*. Léopoldville: Studia Universitatis Lovanium.
- Digombe, L., Jézégou, M. P., Locko, M. and Mouleingui, V. 1987a. Un an de recherches archéologiques dans la région de Port-Gentil (Ogooué-Maritime, Gabon). Libreville: Laboratoire d'Archéologie et d'Anthropologie.
- Digombe, L., Locko, M. and Emejulu, J. 1987b. Nouvelles recherches archéologiques à Ikengué (Fernan Vaz, province de l'Ogooué-Maritime, Gabon): un site datant de 1300 BC. *L'A.* 91,2:705-9.
- Digombe, L., Locko, M. and Jézégou, M. P. 1987c. Mission archéologique dans la Ngounié et la Nyanga (sud-Gabon). Libreville: Laboratoire d'Archéologie et d'Anthropologie.
- Digombe, L., Locko, M. and Jézégou, M. P. 1987d. Recherches archéologiques au Gabon, année académique 1986-1987. *Nsi* 2: 29-31.
- Digombe, L., Schmidt, P., Mouleingui, V., Mombo, J. and Locko, M. 1987e. Gabon: the earliest iron age in west Central Africa. *N.A.* 28:9-11.
- Digombe, L., Locko, M. and Jézégou, M. P. *in press* a. Un site paléolithique près du lac Noir de Ndendé (Gabon). *B.S.P.F.*
- Digombe, L., Locko, M. and Jézégou, M. P. *in press* b. La chronologie du site d'Ikengué (Gabon): 3210 BC. *L'A.*

- Eggert, M. 1983. Remarks on exploring archaeologically unknown rain forest territory: the case of Central Africa. *Beitrag zur Allgemeinen und Vergleichenden Archäologie* 5: 283-322.
- Eggert, M. 1987. Imbonga and Batalimo: ceramic evidence for early settlement of the equatorial rain forest. *A.A.R.* 5:129-45.
- Ehret, C. 1982. Linguistic inferences about early Bantu history. In *The Archaeological and Linguistic Reconstruction of African History* (eds. C. Ehret and M. Posnansky): pp. 57-65. Berkeley: University of California Press.
- Elenga, H. 1987. *Les plateaux Bateke (Congo): paléoenvironnements quaternaires d'après l'étude palynologique du sondage du bois de Bilanko*. D.E.A. thesis, Aix-Marseille and Perpignan Universities.
- Farine, B. 1963. *Sites préhistoriques gabonais*. Libreville: Ministère de l'Information au Gabon.
- Farine, B. 1965. Recherches préhistoriques au Gabon. *Bulletin S. P. P. G.* 3: 68-84.
- Gabel, C. 1985. Archaeology in sub-Saharan Africa, 1800-1960. *I.J. A.H.S.* 18,2:241-64.
- Giresse, P. 1978. Le contrôle climatique de la sédimentation marine et continentale en Afrique centrale Atlantique à la fin du Quaternaire: problèmes de corrélations. *Palaeogeography, Palaeoclimatology, Palaeoecology* 23:57-77.
- Giresse, P. and Kouyoumzakis, G. 1974. Observations sur le quaternaire côtier et sous-marin du Congo et des régions limitrophes: aspects eustatiques et climatiques. *Bulletin ASEQUA* 42-3:45-61.
- Giresse, P., Malounguila-N'Ganga, D. and Barusseau, J.-P. 1986. Submarine evidence of the successive shorefaces of the Holocene transgression off southern Gabon and Congo. *Journal of Coastal Research* 1:61-71.
- Hamy, E. T. 1897. L'âge de pierre au Gabon. *Bulletin du Musée National d'Histoire Naturelle* 5:154-6.
- Heine, B. 1984. The dispersal of the Bantu peoples in the light of linguistic evidence. *Muntu* 1:21-35.
- Heinzelin de Braucourt, J. de. 1952. *Sols, paléols et désertifications anciennes dans le secteur nord-oriental du bassin du Congo*. Bruxelles: Institut National pour l'Etude Agronomique du Congo belge.
- Heinzelin de Braucourt, J. de. 1957. *Les fouilles d'Ishango*. Bruxelles: Institut des Parcs Nationaux du Congo belge.
- Hervieu, J. 1969. Les industries à galets aménagés du haut bassin de la Bénoué (Cameroun). *Bulletin ASEQUA* 22:24-34.
- Kouyoumzakis, G., Lanfranchi, R. and Giresse, P. 1985. Les datations radiométriques de la République Populaire du Congo. *Cahiers congolais d'Anthropologie et d'Histoire* 10:11-31.
- Lanfranchi, R. 1986. Les industries préhistoriques congolaises dans le contexte du quaternaire récent. *Actes du symposium 'Changements globaux en Afrique'*: 247-9. Paris: ORSTOM.
- Lanfranchi, R. 1987. Recherches préhistoriques en République Populaire du Congo: 1984-1986. *Nsi* 1:6-8.
- Lanfranchi, R. in preparation. *La préhistoire de l'Afrique centrale occidentale: hommes et milieux*. Ph. D. thesis, University of Paris I.
- Lanfranchi, R. and Schwartz, D. in press. L'évolution du Mayombe congolais à la fin du quaternaire: nouvelles données géomorphologiques, pédologiques et préhistoriques.
- Locko, M. 1987. Préhistoire du Gabon: deux types d'outils du paléolithique inférieur découverts dans la région de Kango, aux environs de Libreville. *N.A.* 29:21-3.
- Maley, J. 1987. Fragmentation de la forêt dense humide africaine et extension des biotopes montagnards au quaternaire récent: nouvelles données polliniques et chronologiques, implications paléoclimatiques et biogéographiques. *P.A.* 18:307-34.
- Maley, J. and Brenac, P. 1987. Analyses polliniques préliminaires du quaternaire récent de l'ouest Cameroun: mise en évidence de refuges forestiers et discussion des problèmes paléoclimatiques. *Mémoires et Travaux de l'E.P.H.E.* 17:129-42.
- Maret, P. de 1982a. New survey of archaeological research and dates for west-central and north-central Africa. *J.A.H.* 23,1:1-15.
- Maret, P. de 1982b. The iron age in the west and south. In *The Archaeology of Central Africa* (ed. F. Van Noten): pp. 77-96. Graz: Akademische Druck und Verlagsanstalt.

- Maret, P. de 1985a. L'archéologie en zone bantu jusque 1984, *Muntu* 1:37-60.
- Maret, P. de 1985b. A survey of recent archaeological research and dates for west-central and north-central Africa. *J.A.H.* 26:129-48.
- Maret, P. de 1986. The Ngovo Group: an industry with polished stone tools and pottery in Lower Zaïre. *A.A.R.* 4:103-33.
- Maret, P. de *in press* a. Le contexte archéologique de l'expansion bantu en Afrique Centrale. *Actes du Colloque International du CICIBA, 1-6 Avril 1985*.
- Maret, P. de *in press* b. Nouvelles données sur la fin de l'âge de la pierre et les débuts de l'âge du fer dans la moitié méridionale du Cameroun. *P.A.C.* 9.
- Maret, P. de *in press* c. Les débuts de la sédentarisation, de l'agriculture et de la métallurgie dans la moitié sud du Cameroun. *Proceedings of the International Symposium on Archaeology in Cameroun, 6-9 January 1986*.
- Maret, P. de, Clist, B. and Mbida, C. 1983. Belgian archaeological mission in Cameroon: 1983 field season, *N.A.* 23:5-6.
- Maret, P. de, Clist, B. and Van Neer, W. 1987. Résultats des premières fouilles dans les abris-sous-roche de Shum Laka et Abeke au nord-ouest du Cameroun. *L'A.* 91,2:559-83.
- Maret, P. de and Nsuka, F. 1977. History of Bantu metallurgy: some linguistic aspects. *History in Africa* 4:43-65.
- Maret, P. de, Van Noten, F. and Cahen, D. 1977. Radiocarbon dates from west-central Africa: a synthesis. *J.A.H.* 18,4:481-505.
- M'Benza-Muaka, Roche, E. and Doutrelepont, H. 1984. Note sur les apports de la palynologie et de l'étude des bois fossiles aux recherches géomorphologiques sur la vallée de la Lubumbashi (Shaba, Zaïre). *Revue de Paléobiologie* volume spécial: 149-54.
- Moguedet, G., Bongo-Passy, G., Giresse, P. and Schwartz, D. 1986. Corrélations entre sédiments quaternaires continentaux et marins au Congo. *Revue de Géologie Dynamique et de Géographie Physique* 27,2:131-40.
- Muya Kamuanga. 1986. *Préhistoire du Zaïre occidental, essai de synthèse des âges de la pierre taillée*. Ph.D. thesis, Louvain-la-Neuve University.
- Nsuka, F. and Maret, P. de 1980. Etude comparative de quelques termes métallurgiques dans les langues bantoues. In *L'expansion bantoue* (ed. L. Bouquiaux): pp. 731-41. Paris: A.D.P.F.
- Oslisly, R. 1986. *Archéologie des enclaves savaniques du Moyen-Ogooué*. D.E.A. thesis, University of Paris I.
- Oslisly, R. 1987. Découverte des premières gravures rupestres au Gabon: les pétroglyphes d'Elarmekora. *N.A.* 29:26-7.
- Oslisly, R. and Peyrot, B. 1987. *L'art préhistorique gabonais*. Libreville: Rotary Club Okoumé.
- Oslisly, R. and Peyrot, B. 1988. Synthèse des données archéologiques des sites de la moyenne vallée de l'Ogooué (Provinces du Moyen-Ogooué et de l'Ogooué-Ivindo), Gabon. *Nsi* 3:63-8.
- Peyrot, B. and Oslisly, R. 1984. *Rapport de la mission d'évaluation des sites archéologiques découverts sur les chantiers du Transgabonais à Lastourville et Franceille*. Libreville.
- Peyrot, B. and Oslisly, R. 1985. Recherches archéologiques récentes au Gabon. *N.A.* 26:14-16.
- Peyrot, B. and Oslisly, R. 1986. Recherches récentes sur le paléo-environnement et l'archéologie au Gabon. *L'A.* 90,2:201-16.
- Peyrot, B. and Oslisly, R. 1987. Paléo-environnement et archéologie au Gabon: 1985-1986. *Nsi* 1:13-15.
- Pommeret, Y. 1965a. *Civilisations préhistoriques au Gabon, tome 2*. Libreville: S.P.P.G.
- Pommeret, Y. 1965b. Note complémentaire à propos du gisement Lupembien et néolithique de Ndjolé. *Bulletin S.P.P.G.* 3:85-107.
- Pommeret, Y. 1966a. *Civilisations préhistoriques au Gabon, tome 1*. Libreville: S.P.P.G.
- Pommeret, Y. 1966b. Les outils polis de la région de Libreville. *Bulletin S.P.P.G.* 6:163-80.
- Pommeret, Y. 1966c. Les hoes et haches taillées de la région de Libreville, *Bulletin S.P.P.G.* 5:95-122.
- Roche, E. 1979. Végétation ancienne et actuelle de l'Afrique Centrale. *African Economic History* 7:30-7.

- Roche, E. and M'Benza-Muaka. 1980. Exemple d'évolution paléoclimatique au Pléistocène terminal et à l'Holocène au Shaba (Zaïre). *Mémoires du Musée National d'Histoire Naturelle*, nouvelle série B 27:137-48.
- Schmidt, P., Digombe, L., Locko, M. and Mouleingui, V. 1985. Newly dated iron age sites in Gabon. *N.A.* 26:16-18.
- Schwartz, D. 1985. *Histoire d'un paysage: le Lousséké, paléoenvironnement quaternaire et podzolisation sur sables Bateke, R.P. du Congo*. Ph.D. thesis, Nancy University.
- Schwartz, D., Delibrias, G., Guillot, B. and Lanfranchi, R. 1985. Datations par le ¹⁴C d'aliés humiques: âge Ndjilien (40,000-30,000 BP) de la podzolisation sur sables Bateke (R. P. du Congo). *Compte-rendus de l'Académie des Sciences de Paris*, 300,2:891-4.
- Soper, R. 1985. Roulette decoration on African pottery: technical considerations, dating and distributions. *A.A.R.* 3:29-51.
- Van Bakel, M. A. 1981. The 'bantu' expansion: demographic models. *C.A.* 22,6:688-91.
- Van Moorsel, H. 1968. *Atlas de préhistoire de la plaine de Kinshasa*. Kinshasa: Editions Universitaires.
- Van Neer, W. 1984. Faunal remains from Matupi cave, an Iron Age and Late Stone Age site in north-eastern Zaïre. *Academiae Analecta* 46,2:58-76.
- Van Neer, W. 1987. Presence of black rhinoceros in the Holocene of the People's Republic of Congo. *Revue de Zoologie africaine* 101:295-99.
- Van Neer, W. and Lanfranchi, R. 1985. Etude de la faune découverte dans l'abri Tshitolién de Ntadi-Yomba (République Populaire du Congo). *L'A.* 89,3:351-64.
- Van Noten, F. 1977. Excavations at Matupi cave. *Antiquity* 51:35-40.
- Van Noten, F. 1982. *The Archaeology of Central Africa*. Graz: Akademische Druck und Verlagsanstalt.
- Vansina, J. 1984. Western Bantu expansion. *J.A.H.* 25:129-45.
- Vidal, P. 1969. *La civilisation mégalithique de Bouar: prospection et fouilles, 1962-1966*. Paris: Firmin-Didot.
- Vidal, P. *in press*. Au delà des mégalithes: archéologie centrafricaine et histoire de l'Afrique Centrale. *Proceedings of the International Symposium on Archaeology in Cameroon, 6-9 January 1986*.
- Vogt, J. and Vincent, P. L. 1966. Terrain d'altération et de recouvrement en zone intertropicale. *Bulletin Bureau de Recherches Géologiques et Minières* 4:1-111.
- Warnier, J. P. and Asombang, R. 1982. Archaeological research in the Bamenda Grassfields, Cameroon. *N.A.* 21:3-4.