

■ COMOROS

The Rock Crystal of Dembeni, Mayotte Mission Report 2013

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Introduction: Mayotte and International Trade

Dembeni's archaeological mission began on 28 July and ended 23 August 2013. The archaeological site was identified during the surveys of Susan Kus and Henry Wright in 1975 and published in 1976. The site has been the subject of regular excavation campaigns in the 1980s and 1990s by the team of Claude Allibert and Henri Lizskowski. The existence of the site is probably related to the estuary of the river Dembeni that provided a good sheltered harbor for the boats of the traders in the region. The site occupies a plateau of five hectares (Wright 1984: 16-19). The habitat of Dembeni consisted of mud and wattle houses with coated lime walls (Wright 1984: 46) and stone foundations of small blocks of porite coral (Desachy and Belarbi 2000: 40-42). To date, no mosque or stone buildings have been discovered.

The site of Dembeni is one of the richest archaeological sites in East Africa. Dated between the 9th and 12th century, a period of intensive trade, first with the Abbasids in the Persian Gulf and then with the Fatimid Caliphate in Cairo. Dembeni has delivered archaeological material of unprecedented wealth from that time, with Chinese and Persian ceramics, as well as glassware and ornaments from all countries of the Islamic world. This accumu-

lation of goods does not occur by chance, during many years, archaeologists have sought the origin of the fortune of this site. Our excavation campaign allowed us to propose a new explanation for the wealth of the inhabitants of Dembeni: it is the trade of rock crystal.

Surveys Around the Site

We conducted a survey around the site to find areas of unloading ("port") and the cemeteries (Figure 1). The survey was pursued by Michel Charpentier and Jean -Pierre Arnaud on 19 September 2013.

We identified two wells; the first is located opposite the present entrance to the site on the national road on the old track of the coast. The second well is lower, 20m from the old track, not far from a ledge with many pottery shards. This ledge is bypassed by the old track, which makes a bend and then follows the coastline of the mangrove. The former track is the easiest access from the shore to the archaeological site of Dembeni. There is an abundance of pottery shards on the flat part, which turns from the road at the mangrove. South of the upper well, the local pottery is abundant. Some shards were collected on the surface including hatched sgraffiatos and a fragment of a Sassanid Islamic jar. Numerous shards were found on the shelf in the corner formed by the old track. To date, two scenarios are possible: the first hypothesis is that all of these ceramics are linked to smaller settlements along the road leading to the main site; the second hypothesis is that these ceramics come from the main site and rolled down the valley with soil erosion.

The ridge, south of the pathway, has no traces of occupation, however at the end towards the sea, a space is littered with stones stuck in the ground, and these could be graves. The same phenomenon is observed on the ridge north of the old track where there is an area with many stones on a much larger space facing the sea. The promontory that separates the bays of Dembeni and Ironi,

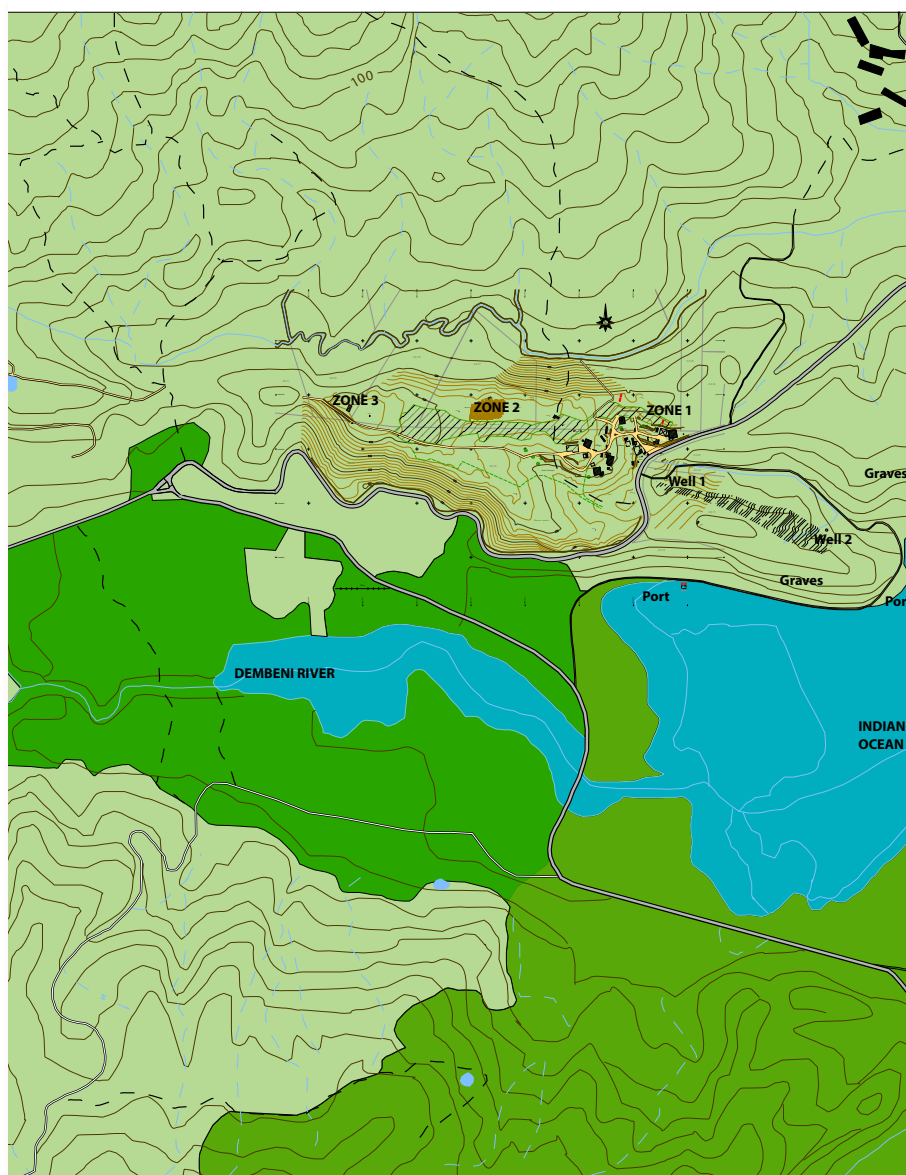


Figure 1: Map of the site of Dembeni, Mayotte, Comoros archipelago

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is extended by a coral plateau that juts far into the lagoon. It is here that the inhabitants of Dembeni may have taken the marine coral for their constructions.

The Excavated Areas

The site was divided into three excavation zones: zone 1 at the east end, zone 2 at the center of the plateau, and zone 3 at the west end. Three

test pits were conducted during the mission, a test pit in zone 1 and two test pits in zone 2. We also refreshed a large section in zone 3, along the track that crosses the site.

Zone 1, Sector 1. The first pit was opened in zone 1 to the eastern boundary of the site, on a mound of detritus of 12m high as estimated by our colleagues of AFAN / INRAP in 1999 and confirmed by our own observations during the topographic survey in 2011. The excavation on the mound mere-

ly confirmed the observations of our predecessors. This huge hill of medieval rubbish is dated to the upper part of the 12th century AD. For the other layers investigated, the archaeological material is fairly homogeneous dating from the 11th to 12th centuries AD. However, we have only searched the first two meters of the mound. Searches must continue so that we can date the earliest levels of the site. The layers have delivered domestic garbage with ashes from the fireplaces and remnants of meals, fish bones, turtle shells, birds and small mammals. Shellfish were consumed in large quantities. The layers investigated were *in situ* and undisturbed, evidenced by mammal bones in anatomical connection, complete spines of fish and shell middens.

Zone 2, Sector 1. Zone 2 is the flat central part of the site, north of the bamboo forest. This bamboo forest forms a natural boundary that fol-

lows the path that cuts the site in two equal parts, north and south. The excavation of sector 1 was located on a line of basalt stones across the plateau from north to south (Figure 2). This line of stone seems to form an enclosure. Indeed, the south-north wall then turns towards the east at the north end of the plateau, just before the slope. The rock structure studied is the western end of the probable enclosure. We first opened a large area of excavation, a rectangle 11.4m long and 4.15m wide. Our goal was to understand the function of this structure. Was it the remains of a fortification, a space with furnaces for iron production or a burial area in the center of the site?

The soil in this area was very compact, a very hard laterite. Once cleared, the ballast had a north, northeast orientation. The surface was composed entirely of medium sized blocks of basalt, but



Figure 2: Test pit of Zone 2, Sector 1.

the excavation revealed the presence of many small blocks of porite coral. Apart from an area where some blocks are stacked, the pit did not reveal a real built wall, but a kind of ballast whose limits east-west remains to be clarified. The structure continues south of the bamboo forest that was identified by Allibert and Lizskowski as a possible industrial area with ovens for iron production. The discovery of burned roots in the soil invites us to think that our predecessors have erred. We have, so far, found no furnaces, however we will continue our research next year.

Archaeological layers were very thin and

the archaeological material was not very abundant, with few ceramics and almost no animal bones. The ceramics can be dated between the 9th to 11th centuries AD with the presence of Sassanido-Islamic jars and hatched sgraffiato. Almost all rock crystals were found in this area (Figure 3). We hypothesize that the stone structure is a kind of enclosure protecting the area where the rock crystal was stored.

Zone 2, Sector 2. We wanted to understand what was at the center of this enclosure. We therefore carried out a small test pit in the center of the plateau, in the middle of the stone enclosure. The choice of the location of the survey was determined



Figure 3: A rock crystal from Zone 2.

by some ceramics that have been identified on the surface. This survey has provided very little information. However, we can draw some preliminary conclusions. There is no habitat in the surveyed area, it is not an area for rock crystal cutting and we have very little archaeological material. Only one archaeological layer was recorded and was very similar to that of sector 1.

Zone 3, Sector 1. The latest area does not really fit in with what we can call excavation, but rather a preliminary exploration of the great tumulus to the west end. At the west end of the site, the track goes down to Tsararano and cuts a hill composed solely of anthropogenic accumulations. We decided to refresh the section cut by the track in order to study the stratigraphy. The stratigraphic unit 001 corresponds to the collection of ceramics found during the cleaning of the large section. We have seen many gray and ashy layers, associated with many animal bones. The levels studied are about 6m of stratigraphy; the whole tumulus is estimated at 8m high. The material collected in this area in 2011 and 2013 is very rich as on the eastern tumulus. We collected a base of a Chinese stoneware jar from the 11th century AD (Pradines 2009:12), fragments of Abbasid lustred wares of the 9th to 10th centuries AD and a few shards of Sassanido Islamic jars. In the current state of research, it is difficult to tell that the Western ‘tell’ is older than the Great Eastern tumulus of Zone 1. It seems that they are more or less contemporary. There is a third large tumulus on the archaeological site near the cow corral of Yahaya family. This tumulus is located south of the main path, in the center of the southern part of the archaeological site. In the absence of archaeological investigations, it has not been proven that this tumulus is anthropic.

The presence of these two great ‘tells’ at the east and west boundaries of the plateau shows a willingness to manage the waste and garbage of the city by rejecting all the rubbish to the periphery of the plateau. Both anthropogenic formations indicate very clearly the limits of the archaeological site. It is hoped that domestic areas and housing are not far from the garbage heap. The central space,

with the stone enclosure and the small amount of archaeological material, was perhaps reserved for other functions: worship area, economic and market area for the rock crystal.

The Archaeological Material

A former test pit of Claude Allibert located between the garage and the houses of the Yahaya family, was used by the mission. All the archaeological material, not selected for the storerooms of the MAPAT (Heritage House of Mayotte), was thrown into this hole. The pit is located on our topographic survey of 2011 and can be found easily.

In the storerooms of the MAPAT, Julie Marchand (PhD student at the University of Poitiers) did the drawing and the inventory of 206 objects. Our goal was to provide scientific documentation of these objects, which were not drawn correctly by our predecessors. We also wanted to know the archaeological material discovered during previous excavations of Dembeni in order to have the most complete picture of the archaeological potential of this site. On the excavation, Julie Marchand made drawings of 116 objects, mostly ceramics. This work will serve for future studies on local and imported ceramics, and on metal finds, bone, glass and stone artefacts (Figure 4).

Most of the shards and objects came from garbage dumps, east and west (Zones 1 and 3). Local ceramics are highly diversified in form and decoration, with closely related shapes to East African ceramics, decorations of incisions, shell impressions, red slips sometimes topped with black graphite designs. Imports are extremely diverse with Sassanido-Islamic jars with turquoise glaze and digital molding (8th to 9th centuries AD) opaque white glaze with blue or green spots present in the oldest layers of Samarra (Kenet 2004: 32-33,145), Bantu ceramic or TIW tradition dated back to 8th to 10th centuries AD, Abbasid lustred wares from the late 9th and 10th centuries AD, many Chinese ceramics and Dusun stoneware jars (9th to 12th centuries AD), including some Indian ceramic storage jars

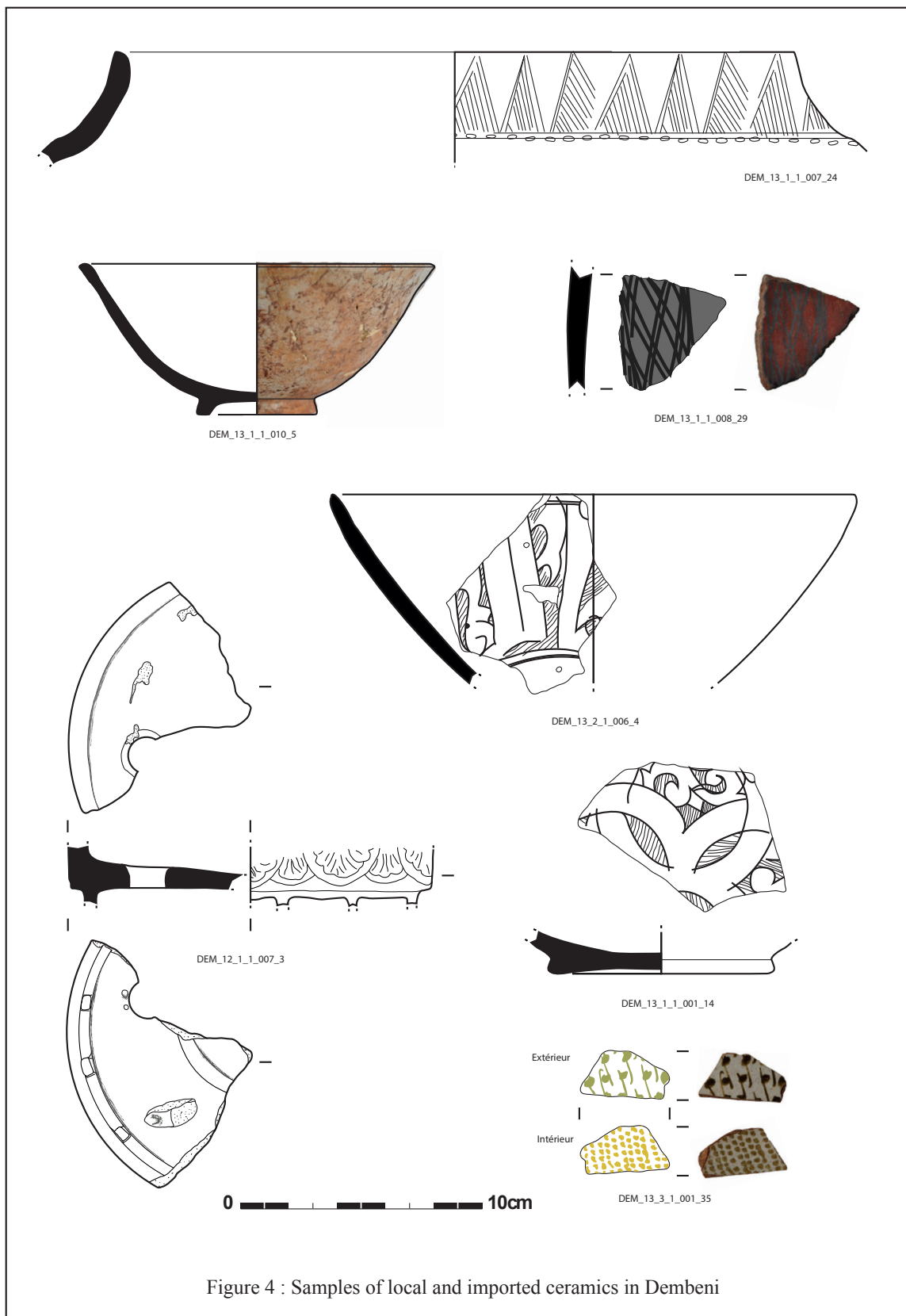


Figure 4: Samples of local and imported ceramics found in Dembeni.

(10th to 12th centuries AD), Persian hatched sgraffiato (second half of the 10th to 12th centuries AD) (Rougeulle 2005).

The presence of large amounts of Abbasid ceramics from Iraq, but also later Persian productions, invites us to rethink the periodization of the history of Mayotte and more broadly of East Africa. In our previous report, we introduced a term rarely used in Africa, the 'Abbasid period'. Sub-Saharan African prehistory ends with the discovery of the route to India by Vasco da Gama in 1498. Contrary to what was published in the 1970s, following decolonization, we can easily say that sub-Saharan Africa has a shared history with the East. Texts and material culture are unambiguous; the Comoros played an integral part in major trade networks in the Indian Ocean. Beyond a necessary local periodization in terms of ceramic typology or the history of island chiefdoms, it is important to integrate an international dimension to the history of Mayotte. The island is linked to a global history of the Indian Ocean with the Abbasids, Seljuks and Fatimids.

In relation to regional trade, we discovered many fragments of gray and green chlorito-schist. These dishes of soapstone were made in Madagascar where carvers are well known around Vohemar. A cemetery from the 14th century AD was excavated in Vohemar, delivering graves with extremely rich imported goods (Vernier and Millot 1971: 28-49). The chlorito-schist vessels of this period include tripods, which are absent in the archaeological levels of Dembeni. This morphological difference is simply due to the fact that Dembeni is an older site (9th to 12th centuries AD) and tripods are probably a more recent innovation (13th to 14th centuries AD). First, chlorito-schist pots are a magnificent proof of former economic relations between Mayotte and Madagascar. But for us, their importance is twofold because they should be connected to the import of rock crystal. This rock crystal is extracted from the hinterland of Vohemar and could explain the enrichment of the inhabitants of this Malagasy port. The fragments of chlorito-schist vases would be the wit-

ness of an invisible and more lucrative economy: the rock crystal.

The site of Dembeni was abandoned in the early 13th century AD, as were many sites in the Indian Ocean, Africa, Arabian Peninsula and India. We have no posterior ceramics from that time. Recently published was that the Indian site of Sanjan in the Gujarat was abandoned in the early 13th century, it has almost the same material culture as Dembeni! Sanjan was founded in the late 7th century (Nanji 2011). For us what remains a fundamental and unsolved question to this day: the founding date of Dembeni. We have not found earlier ceramics than the late 8th century, but can we consider an older occupation?

African Rock Crystal

During the excavations, numerous blocks of rock crystal were exhumed as chips and flakes (Figure 5). These findings are in addition to crystal blocks found by our predecessors and stored at the MAPAT. Rock crystal is a perfectly clear and colorless variety of the mineral species hyaline quartz. Rock crystal is known and used since ancient times, both for its beauty and purity, 'a stone of ice', but also for its religious and mystical properties as a symbol of light, magic and protection.

Sources

The presence of large amounts of rock crystal fragments in Mayotte pushed us to re-examine the historical sources on the trade of this commodity in the Indian Ocean. Many Arab and Persian authors speak of a rock crystal from the islands of East Africa. According to al-Biruni, imported crystal came from the Zanj islands and al-Dibâjât (Laccadive and Maldives). According to al-Biruni, rock crystal is cut and exported in the port city of Basra in Iraq (Contadini 1998: 17-18), the major center in the Abbasid era. Then, at the end of the 10th century AD, craftsmen moved to Cairo, probably attracted by the booming economy of the city, the



Figure 5: Samples of rock crystal found in Dembeni.

Fatimid court, and maybe for religious reasons as many of them were Ismaili (Bloom 2008: 101-102). Al -Biruni said that in Basra, the raw material was

seen by an assessor (*muqaddir*), who considered the form and decided what to do with large and small pieces. In this trade, the largest commission goes to

the *muqaddir* and not to the seller (Contadini 1998: 20).

In the mid-11th century, Nasir-i Khusraw (AD 1004-1074) speaks of rock crystal sold in the lamp market, north of the Mosque of Amr. *Suq el-Qanadil*, which is known for its rare and precious objects such as boxes and tortoise shell combs, elephant tusks of *Zengbar* and rock crystal beautifully cut. Rock crystal was brought from the Maghreb, but it's said that recently (between AD 1047 and 1052), people of Cairo received from the *Qulzum Sea*, (the Red Sea), more beautiful and much better quality of rock crystal than the Maghreb (Nasir-i Khusraw 1970 [Ed. 1881]: 149). The Red Sea was used as the main line of communication with the Swahili coast, the *Zanj*, and another African product ivory, is also mentioned by Nasir-I Khusraw in the same chapter. This information is corroborated by the Geniza texts of Jewish merchants from Cairo. Crystal, called *Billawr*, transited through Aden before being sent to Cairo (Goitein 1983: 223-224).

The crystal market in Fustat indicates that these objects were not reserved only for the Fatimid rulers. The workshops were probably located in the commercial and industrious city of Fustat. There had to be two types of productions, as was suggested by Nasir-I Khusraw cited above: one production reserved for the court, the other for the wealthy elite.

One hundred and eighty objects from the Islamic period from the 9th to the 11th centuries, have survived to the present day. These objects are mostly jugs, jars, basins, bottles, goblets and ewers (Contadini 1998: 20). There are also some examples of weapons like mass head, swords and dagger grips. Smaller fragments were transformed into pendants, amulets, beads and seals. As stated in the documents of the Geniza, low-quality rock crystal or small pieces were used to make Khol bottles or *mukhula* for make-up (Goitein 1983: 223-224).

Later, Al-Akfânî (AD 1348) said that the rock crystal comes from Zanj (East Africa), Badakhshan, Armenia, Sri Lanka, the land of the Franks

(Alps), and Morocco (Contadini 1998: 17-18). This author still recalls the importance of Zanj in the rock crystal trade.

Origin and Destination

The rock crystal discovered is not native to Mayotte, but came from Madagascar. It was exported to the Comoros and Mayotte with other products, including cooking pots made of chlorito-schist (or soapstone). The large island of Madagascar has long been known as one of the main sources of crystal in the world. The largest crystal in the world has also been found in Madagascar. It is certainly this rock crystal (or pegmatitic quartz) from Madagascar that was used largely in the Sassanid, Abbasid and Fatimid crafts (Gonthier and Chiappero 2009: 91-96). Contadini already raised the possibility that the crystal of the Islamic world could come from Madagascar (Contadini 1998: 16-18).

In 1870, Grandidier found that the Hova, a coastal population of Madagascar, brought crystal to the natives of the hinterland and they sold this rock crystal to Europeans earning large profits. In this trade, rock crystal is often indicated as coming from Vohemar or Nosy Be, but the rock crystal was only loaded on the boats at these ports and they are not the extraction sites (Lacroix 1923 (vol. 2): 109-110). It is possible that the situation was the same in the Middle Ages for the Swahili in Kenya and Tanzania. The Maores (inhabitants of Mayotte) and the coastal people of Madagascar brought some raw materials to the people from the mainland. Their role as intermediaries assured their profits.

The oldest Islamic crystals were cut in Persia and Mesopotamia. The first rock crystal objects are indeed pre-Islamic and attributed to the Sassanids (7th century AD). Later the artisans perpetuated and improved their techniques under the Abbasid patronage (Bloom 2008: 104-105; Contadini 1998: 22-25). Very few crystal objects are assigned

to Egypt during the 9th to 10th centuries AD. The work of rock crystal is attested from the Tulunid period (AD 868-935), but these few examples betray Abbasid influences (“bevel style of Susa”). Basra and Cairo were the two major production centers of crystal objects, between the 10th and 11th centuries AD (Contadini 1998: 18-20). The techniques to cut, carve and polish the crystal are very similar to glass; it seems that this is the same school of craftsmen who have produced these beautiful objects.

At the end of the 10th century AD, many Abbasid artisans migrated to Cairo to practice their art in the courts of the Ismaili princes. This phenomenon is also observed for the ceramics with the famous lustred pottery. The art of rock crystal reached its peak under the Fatimids. Only a few pieces are dated with certainty to the Fatimid era because they are decorated with datable inscriptions. The best known is an ewer with a Kufic inscription with the name of the caliph al-Aziz Billah (AD 975-996) in the Treasury of San Marco in Venice. We should also mention the rock crystal objects in the Pitti Palace in Florence, the Victoria and Albert Museum in London (c. AD 1000-1050), the Cathedral of Fermo, and the Louvre, with an ewer formerly deposited in the Treasury of Saint- Denis (AD 1000-1015).

Iron Production and the Slave Trade: Wrong Directions

Our predecessors who worked in Mayotte have of course raised the question of the origin of the wealth of the inhabitants of Dembeni. They found rock crystal, which appears at the end of their reports under the name of ‘quartz’. They are, alas, on the wrong track, including slavery and metallurgical production.

Thus, according to Lizskowski (2000: 74):

Quel produit autre que celui des esclaves, était en mesure d'équilibrer ces achats onéreux en provenance d'Orient ? Il y a fort à parier qu'aux Comores la traite des esclaves était un des principaux revenus des

Dembéniens!

According to Allibert *et al.* (1993: 17):

“On notera que ce sont ces tuyères en latérite ou en glaise brûlée dont il a été trouvé des restes en nombre considérable sur tout le site de Dembéní et que nous avons, H. Wright et nous même, confondu avec des morceaux de mur en pisé brûlés. Le nombre élevé de tels restes confirme que l'ensemble de Dembéní était un atelier de métallurgie de première importance».

In addition to a problem of vocabulary, it is not ‘rammed earth’ but ‘wattle and daub’ construction. It seems that the interpretation of H. Wright was good. We collected several fragments of these tuyeres ‘pipes’, which are in fact elements of houses specifically characteristic of perishable materials or wattle and daub in Swahili architecture (Pradines 2010). During the excavation of Area 2, we found the presence of burned roots in the soil, leaving strong impressions. These traces are typical of slash and burn agriculture practiced in Mayotte. We therefore examined the documentation of our predecessors on the furnaces of Dembeni. The archaeological documentation is very thin, drawings and photos of very poor quality that do not meet scientific criteria to suggest the existence of such furnaces (Allibert *et al.* 1993: 7-13). By coincidence, burnt roots were found during our mission that left traces very similar to the rough sketches made by our predecessors.

To conclude this chapter, there are certainly furnaces for iron production in Dembeni because we found some iron slags but in limited numbers. Spearhead sockets were found by our team, and spearheads found by our colleagues before, surely correspond to local production. But it is not the pseudo Austronesian furnaces imagined more than described, and not of course an industrial production. According to Allibert and Lizskowski (2001: 182-183):

... nous sommes en droit de faire l'hypo-

thèse de la présence de quelque 300 fours de faible diamètre mais qui auraient pu fonctionner simultanément .

This ‘furnace’ hypothesis conditioned the research on Dembeni, and the presence of quartz has been interpreted as an element used for the reduction of iron ore (Allibert 1993: 15-17).

Finally, our predecessors have followed too quickly and with too much trust in the conclusions of Mark Horton on the Swahili rock crystal extracted in the hinterland of Mombasa (Horton 1986). These writings prompted our colleagues to underestimate the place of Mayotte in the trade of rock crystal (Liszkowski 2008). To date, no scientific evidence has been provided to support the proposal of Mark Horton, which remains a hypothesis as pointed out also by the author. In our view, it is to Madagascar and Mayotte that we should look.

Interpretation of Archaeological Data in the Light of the Sources

From Malagasy origin, the rock crystal of Mayotte was re-cut in draft form on the site of Dembeni. Arriving in Mayotte, the Islamized merchants exchanged ceramics, fabrics, beads and glass for the precious rock crystal, of which only the best parts were stored for export and for ‘the great journey’. On the site Dembeni, archaeologists can find only the flakes and remains of this activity.

The rock crystal arrived in Baghdad or Cairo, via Persian merchants who rented the services of Omani boats and remained for months in Africa. They were stationed in many Swahili ports including Mogadishu, Mombasa, the islands of Zanzibar and Pemba, and then they sailed south to Kilwa and Mafia. They always pushed further south to Mozambique and the gold mines of Mwene Mutapa or to the southeast to the Comoros and Mayotte for rock crystal.

In the 11th century, rock crystal was discharged in Aden in Yemen. The products were then

shipped to the ports of Aydhab and Quseir on the Red Sea. Precious goods were then loaded on animal back to the Nile Valley and transferred to *felucca* ‘boats’ to Cairo and Alexandria. Rock crystal was then exploited and shaped by specialist in the old city of Fustat-Misr.

Then, after sales, conquests, and diplomatic gifts, Fatimid rock crystal reached Europe. Some objects were ‘Christianized’, enshrined in reliquaries of precious metals and integrated as cult objects in the treasures of St. Mark’s Basilica in Venice or the Abbey of Saint-Denis, north of Paris. Objects produced at this time are well known and adorn all the major museums in the world, from the Louvre in Paris, to the Victoria and Albert Museum in London. Small pieces of rock crystal found in Mayotte are probably related to this prestigious art.

We will continue our research on this new issue by seeking the cutting workshops and the warehouse areas on the site in Dembeni. In addition, we will try to establish the relationship between the crystal fragments found in Dembeni and the famous objects in the museums in the West. For that, partnerships and collaborations are being explored with the SOAS, Oxford and the Victoria and Albert Museum.

Preliminary Conclusions

Dembeni appears to be a major distribution center for rock crystal in the Indian Ocean. Therefore, several questions arise if Dembeni was a center for re-distribution: who controlled the trade, Malagasies or Maores? Could there be some sort of Malagasy trading post in Mayotte? Recent history shows Malagasy domination on the island of Mayotte, but can we use the models of modern history for the medieval past of the island? It is difficult to say in the present state of research. However, we do not want to follow the clichés developed by our predecessors who probably over-interpreted the importance of Malagasy influences. These influences exist and are very old, this is particularly visible with certain productions such as the chlorito-schist

or soap stone of Madagascar. But is it possible to go further?

Is it possible that it is the Maores, from Bantu origin and following the Swahili culture, who used their intermediate position to control the trade and products from Madagascar? The best example in East Africa is the city of Kilwa who controlled the trade of gold mined in Zimbabwe (Pradines and Blanchard 2005). Dembeni, like Kilwa, would have controlled the trade of the rock crystal. As traders in contact with Muslim cultures, Maores have a clear economic benefit, they benefit from foreign technology, ships, architecture, and probably weapons to ensure economic and military domination. The islands of Kilwa or Dembeni, had a monopoly that generated significant gains for acquiring imported objects such as Persian and Chinese ceramics.

The site of Dembeni was abandoned in the early 13th century. Other major sites of the Indian Ocean were abandoned or rebuilt during this period: Sanje ya Kati, Kilwa. The decline of Dembeni also corresponds to the increase of power of Vohe-mar in Madagascar. It seems that at this time, with the change of trading networks and the enrichment of some coastal sites, the Malagasy had the opportunity to take some autonomy from Mayotte. The history of the Comoros, and especially Mayotte, cannot be separated from the large island of Madagascar. Nevertheless we should seriously reconsider the model, purely hypothetical, of a Malagasy domination over Mayotte during medieval times. This supremacy of Madagascar is not proven by archaeology. The monopoly of rock crystal tends even to prove that it was Mayotte, which controlled the trade in this part of the Indian Ocean. The story is not linear, but rather cyclical, the former dominant became the dominated and vice versa.

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