

found. The artifacts linked to Columbus were found eight inches beneath the surface, said Charles Hoffman of Northern Arizona University, who helped supervise the excavation. "I knew that if this was where Columbus landed we should unearth some evidence of Spanish contact," Mr. Hoffman said in his report. "Needless to say, the entire crew is elated with the finds." Marvin Smith, an archaeologist of the University of Florida, said he dated the beads from 1490 to 1560. "They are the type of beads Columbus was using, according to his journals," Mr. Smith said in an interview. "It looks very possible that they were his." Columbus's log relates that his crewmen traded beads, buckles, and rings with Indians they met on the island the Indians called "Guanahani," believed to be San Salvador.... (*The New York Times*, September 15, 1983, p. A12)

67. SUMMARY OF AN ARCHAEOLOGICAL RESEARCH MISSION TO EASTERN SENEGAL, by Marie-José Oppen (1990, 16:13-15)

A grant from The Bead Society of Los Angeles allowed me to travel to extreme eastern Senegal in February, 1990, in order to co-organize and participate in an archaeological research project in collaboration with the Prehistory and Protohistory Department of the Institut Fondamental d'Afrique Noire (IFAN) headquartered in Dakar, the capital of Senegal.

Several sites were investigated during the 20-day mission. Dating from the neolithic period to the 20th century, they yielded a number of beads, adornments, and fetishes. For the most part, these sites are located in a region that is sparsely inhabited and far from "civilization." The work was often accomplished under very harsh conditions due to the lack of roads or tracks, unavailability of potable water, extremely high daytime temperatures, and the presence of potentially dangerous animals such as "dog-headed" baboons and lions. Confirmed reports of lions attacking cow herds in the area forced the investigators to abandon their outdoor camp on the banks of the Falémé River.

One of the sites yielded a particularly interesting number of artifacts including 23 beads made of bone, shell, carnelian, stone, copper, ceramic, and glass; spindle whorls; a fishnet weight; two complete ceramic bracelets and pieces of others; two zoomorphic ceramic statuettes; a ceramic statuette with a phallic symbol at one extremity and the head of a female at the other (apparently a fertility fetish); and several polished tools including a millstone, pestles, and hand axes. Numerous potsherds were found on the surface. Measuring approximately one kilometer by 400 meters, the site was utilized during the Neolithic period

(when it was an important stone-working center) and the subsequent Iron Age.

The beads, along with one bone pendant, were discovered at opposite ends of the site. At locus no. 1, situated at the summit of a small butte, the beads, the bone pendant, and several spindle whorls were found within a 100 m diameter, either on the surface or just below it (not deeper than 1 cm). The protohistoric layer did not go any deeper than 5 cm. Below this, the Neolithic layer did not exceed 10 cm. Mixed material from the different layers was found in the gullies along the butte's slope.

Similarly, at locus no. 2, the Iron-Age layer did not exceed 5 cm in depth and the beads were discovered either on the surface or just below it. A Neolithic layer was not discovered, despite the presence of a polished hematite hand axe and a solitary carnelian bead of Neolithic workmanship. Also discovered at locus no. 2 were the three fetishes, the earthenware bracelets, a fragmentary bronze bead, as well as a splendid polished millstone. The bracelets, the bronze fragment, and one cylindrical blue-glass bead were found near the remains of a stone foundation which was thoroughly investigated by the mission team. Test trenches dug to a depth of 5 cm proved to be sterile. On the surface, however, abundant pottery sherds were found, examples of which are currently being studied at the IFAN laboratories in Dakar.

Unfortunately, the lack of meaningful archaeological layers, frequent brush fires, and the presence of wild animals at the site did not allow for the establishment of precise dating procedures in the field. However, two carnelian beads were found which, unlike the one of Neolithic manufacture, resemble similar beads found in Senegalese tumuli dating to the 11th century.

Six of the eight glass beads found at the site are drawn cylinders displaying a cobalt blue color at first glance. When held up to the light, however, several of these beads appear to be greenish yellow, like the dichroic beads discussed by Davison, Giauque, and Clark (*Two Chemical Groups of Dichroic Glass Beads from West Africa*, 1971, *Man*, vol. 6, no. 4). At IFAN, similar beads are recorded as having been found at the ruins of the medieval town of Koumbi-Saleh, believed to be the capital of the ancient Ghana Empire, as well as at the Djenne and Gao sites in what is now Mali. A fragment of one of the glass beads found in Senegal will be analyzed to see if it can be attributed to the Medieval period of Arab trade in the area.

The two other glass beads represent different types altogether. One is a small annular form emerald green in color. The other is pyramidal and opaque black. The latter bead was apparently decorated with a single raised spot of opaque white on one side. The two extremities of the

perforation have very different dimensions. Beads of this type have been found at several Medieval sites in West Africa. No glass beads of European manufacture were found at the Senegal site, nor were any discovered within a 5-km radius of the site. However, another drawn cylindrical blue bead similar to those found at locus no. 1 was discovered some 15 km away along with pestles, polished stones, and numerous potsherds.

These sites are located well within the Galam-Bambouk auriferous region. The gold found in the area was the main contributor to the wealth and importance of the empire that existed during the Middle Ages. The presence of the three fetishes indicates the probability of animistic practices in a region that was yet to experience the period of Islamization that took place during the 11th century, after the annihilation of the Ghana Empire by the Almoravides.

The recovered ancient beads were undoubtedly traded for the gold that was (and still is) found in the Falemé River, close to the site. Although the source of these beads is not certain, it is probable that the specimens entered eastern Senegal via the caravan routes that led south from Morocco.

68. PALAU: THE GLASS PALACE, by Marie-José Oppé (1991, 19:11-13)

Palau de Vidre is the Catalan name of a small village in southern France where the foothills of the Pyrenees meet the Mediterranean Sea. The village has maintained its original name to this day, some 330 years after the region became a part of France. Before that, the region of Catalonia belonged to the kingdom of Spain. Palau de Vidre translates as "Glass Palace." However, despite documentation showing that numerous and well-known glass factories existed in the area during the Middle Ages, no solid archaeological evidence has yet been discovered.

Glass slag found in stratified archaeological layers attests to the existence of glass factories during the Roman occupation (200 B.C. to A.D. 300), and, in 1983, the local archaeologist, Annie Pezin, found 11 monochrome green and reddish-brown glass beads in the tomb of a small child dating to the third century. Located at chest level, the beads were either part of a necklace or a decorated piece of clothing. The form of most of the beads was irregular-annular (Fig. 1),



Figure 1. The various forms of glass beads from Palau de Vidre, France; approximately life size (black = black, stippled = green, and hatched = red).

with an average diameter of 5 mm and an average thickness of 1 mm. Also found were two green faceted stone beads, one round black stone bead, and a silver ring.

Numerous other glass beads dating from different periods have also been discovered locally at Iberian, Phoenician, and Visigoth sites. Beads have also been found in the Medieval tombs of travelers going to and from Santiago de Compostela, a pilgrimage center in northwest Spain.

Palau de Vidre is situated along the banks of the Tech River, an ideal location for the establishment of glassmaking activities. The Tech furnishes an excellent-quality sand for this purpose, and the plants that grow in the briny marsh area are an abundant and perfect source of material for the fabrication of soda, an important ingredient in the glassmaking process. The neighboring forests provided wood to fuel the factory ovens. Palau was also situated close to major trade routes, as well as to the port at nearby Collioure, from which all the maritime commerce of northern Catalonia arrived and departed. The naval flotilla based at Collioure was both powerful and well known. Important commercial exchanges took place with North African Mediterranean countries including Egypt and Syria, which were the preferred markets for Catalan traders. In return for their merchandise, these traders obtained silk, gold, leather, spices, and slaves. Alice Frothingham (1963) also informs us that "Catalan sea captains trading in the Eastern Mediterranean brought back rare glasses from Alexandria, Beirut and Damascus."

The kings of Aragon took up residence in Collioure and, in 1396, one of the queens accorded the inhabitants the right to receive pirates and corsairs in the port for the purpose of trade. During this time, southern France was also an exporter of glass objects. One of the first indications of this trade concerns the export of a case of glass to Algeria in 1302 (Foy 1989:378). Catalan glass factories were able to perfectly imitate glass fabricated in Damascus and Venice. By the 15th century, Catalonia had become a major glass-producing center. In addition to "tableware," the factories made "beads for rosaries, necklaces and trimming for ladies' gowns" (Frothingham 1963:23). These objects were sold locally by traders of general merchandise and notions who worked at markets or were traveling salesmen.

From its renowned past, Palau has conserved its original name. Today, one of the tourist attractions in the village is a collection of necklaces composed of old beads created by a local designer and sold in the campground boutique. The necklaces are made using glass beads from mortuary wreaths that have been discarded because they are too damaged to remain on tombs in the village cemetery. This type of beaded wreath was very popular in France from the end of the 19th century to just before the start of World War