Contributions of the Center for Bead Research 3:

PRELIMINARY REPORT ON THE BEADS FROM SIRAF, IRAN IN THE DEPARTMENT OF ORIENTAL ANTIQUITIES, BRITISH MUSEUM

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The material studied for this report are the beads and related objects excavated from the Early Islamic port of Siraf, Iran, by David B. Whitehouse between 1966 and 1973. It is housed in the Department of Oriental Antiquities of the British Museum.

The beads from Siraf have been studied in conjunction with those from two other Early Islamic sites: Nishapur, Iran, excavated by Charles K. Wilkinson for the Metropolitan Museum of Art, New York, and Fustat, Egypt, excavated by George T. Scanlon and collected by others, mostly contained in the Islamic Museum, Cairo. This is the first scientific study of Early Islamic beads undertaken. In a broader context, the beads of these sites are being examined as part of a long-range project of the Center for Bead Research on the bead trade of the Indian Ocean from about 500 B.C. to A.D. 1500.

Beads are sensitive markers of human activity and thought. They are often made of new materials, by processes in the forefront of technological innovation, or by methods uniquely devised for them. They are indicative of aesthetic, social, religious, and other cultural attributes, and in some cases are virtually the only surviving artifacts representing past forms of belief and thought.

Bead research is an interdisciplinary field, relying as much on data derived from materials studies as the humanities. It is a specialized study, requiring a detailed knowledge germane to the study of other artifacts, but not often available to other specialists in full.

The Center for Bead Research's methodology is to gather data from archival and comparative sources as well as direct observation. This data is applied to questions concerning the whole range of human behavior involving beads: 1.) What is their origin? 2.) How did they arrive at the site? 3.) How were they used at the site? and 4.) How did they leave the living context to enter the archaeological? Answers from one site may then be coordinated with those from similar sites to form a regional understanding of past bead use. Here the Siraf material will help clarify the role of beads and the bead trade in the Early Islamic world as well as around the Indian Ocean.

The Site

The Arabic literature describing Siraf has been summarized by Whitehouse (1968:2-3). The first dated reference to the port's trade is apparently by Ibn al-Faqih, who mentioned around A.D. 850 that her ships sailed to India. About the same time Sulaiman the Merchant described Siraf as a vital link in the trade from Basrah to Oman, Quilon (India), Kedah, and China (Hasan 1928:115). In the 10th century Ibn Hawqal wrote, "Here (Siraf)... there is not any husbandry or cultivation of the ground; and they bring water from a distance. There are not any trees immediately about Siraf, and the inhabitants devote their whole time to commerce and merchandise (Sastri 1937:434).

This drive for commerce made Siraf famous. In three separate passages Mas'udi (912 to 926) repeated like a mantra the names of Siraf and 'Uman (Musqat): "The sailors of Siraf and 'Uman (navigate) the seas of China, India, Sind, Azania, Arabia, Erythrea, and Abyssinia.... The sailors of Siraf and 'Uman voyage regularly to Kalaha (Kedah) and Zabij (Java).... Sofala is the furtherst limits of the country of the Zanj. The ships of the people of 'Uman and Siraf go there, and it is the limit of their navigation." (Hasan 1928:125, n.3, 4, 5).

In the same century Istakheri said Siraf was nearly as large as Shiraz, with multistoried houses of teak from Zanzibar that overlooked the sea. The Sirafi merchants were the richest in Fars (Hasan 1928:115, n.3). He named many imports from Africa and the East and said it was a great market for pearls (Sastri 1937:437).

By the late 10th century Muqaddsi described Siraf as being in decline after a week-long earthquake in 977. The fall of the Buyid dynasty (ca. 1055), by whom Siraf seems to have been favored, also hastened its demise (Whitehouse 1968:2-3).

The historical record has been confirmed by archaeological research. Siraf was already important in Sasanian times, and the site of a fort (Whitehouse 1972:87). As an Islamic port, it apparently flourished from ca. A.D. 780 to 1200, with a definite decline in the 11th century, though some building activity continued through the 15th (Whitehouse 1969:59-60).

This is not the formun to discuss the archaeology of Siraf in detail, especially as it is to be published soon by Whitehouse. However, the data furnished by his interum reports give us some idea of the context in which the beads were found, information regrettably not often enough available to the specialist.

The Material

A total of 401 objects were studied for this report, not all of them beads. Because of our interest in the context in which beads functioned, we have also catalogued other simple forms of adornment (cabochons, rings), some wasters (especially of glass), spindle whorls, and some maritime products (shell bangle wasters and fish vertebrae). The total number of beads was 251, constituting 62.6% of all objects studied.

We may divide the beads into groups according to the raw materials used fortheir manufacture. At Siraf synthetic materials dominated the assemblage. The Siraf distribution is quite different from that at contemporary Nishapur (Table 1).

TABLE 1

Bead Materials at Siraf and Nishapur

MATERIAL	SIRAF		NISHAPUR	
	Number	%	Number	%
Mineral	62	24.7	159	23.2
Organic	33	12.7	325	47.5
Synthetic	156	62.5	202	29.4

The synthetic beads at Siraf were dominated by those of glass (116 beads; 42.2% of all beads), followed by faience (29; 11.6%). The mineral beads were mostly of the quartz family (34; 54.8% of stone beads), dominated by carnelian. The organic beads are mostly shell and what may be bitumen. A more detailed discussion of each major group follows.

GLASS

Glass is the inorganic product of melting a metal and cooling it below its point of crystallization without allowing it to crystallize. As used here, it is always an artificial product made chiefly of silica. Glass is a complex substance and glass history and technology are complex subjects. Since the invention of glass in the mid-third millennium B.C. beads have been one of the most common of glass products. Because they are colorful, attractive; portable, and durable, glass beads have been trade items for ages. By the time Siraf was built, glass, glass bead-making and the glass bead trade had been established foe millennia.

Since glass working evidence was recovered in the Siraf excavation, and since the Siraf beads are primarily of glass, it is natural to askmif there had been a beadmaking sector in the Siraf economy. To answer this, we must first distinguish between three activities: glassmaking, glassworking, and glass beadmaking. Glassmaking requires kilns and pots and produces slag of a distinguishable type (Bachmann 1982:3, 20). Glassworking leaves evidence in the form of melted pieces of glass, drips, and other waste. Glass beadmaking wasters take on forms dependant upon the types of beads being made. Any one or any combination of these activities may take place at any given site. Recycled glass may be melted down and reworked; glassworking does not necessarily imply glassmaking.

At Siraf Whitehouse found no evidence specifically for glassmaking (1971:15). A sufficient number of glass chunks, ingots or "cakes" (a total of 60), splatters (8), melted pieces (5), and pulled out pieces (20) were found to attest to glassworking. However, none of this material, in the author's experience, clearly points to the making of the glass beads found there.

Apparently all the glass beads found at Siraf were imported to the site. We may discuss them according to the way in which they were made.

The largest number of glass beads (46; 39.7% of glass beads and 18.3% of all beads) were drawn, or cut from tubes. They are the small monochrome Indo-Pacific beads that dominated the bead trade from South Africa to South Korea for some 1500 years. At the time that Siraf was an active trader they were being made at Mantai, Sri Lanka (Francis n.d. a), with a few other Southeast Asian sites as secondary sources (Francis n.d. b).

The next most numerous glass beads (33 beads; 28.4% of the glass beads) were made by winding the glass around a shaft of some sort. This was most likely done by putting an iron mandrel into a furnace and twisting it in the glass until a bead was built up. This is the oldest and most widespread way to make glass beads and little about their origin can be discovered by noting the technique alone.

Segmented beads (25 beads; 21.5% of the glass beads) were next most common. As used here, segmented beads were made by constricting a glass tube and cutting apart the resulting bulges. These beads are not well known, but work at Mantai, Nishapur, Fustat, and now Siraf, as well as at Oc-eo, Vietnam (Malleret 1962) and Scandinavia (Callmer 1977) show them to have been an important class of beads. Edward Hill of Glassblowers of Greenwich consulted on the segmented beads of Siraf and Mantai. He tentatively concludes that they were: a.) worked near a furnace and not by any lamp technique, b.) made from tubes held on a wire to be reheated, and c.) were perhaps constricted in different ways. Oda (1966) has suggested a pincher-like tool for the constricting. Hill suggests rolling the tube in a box or frame with metal wires or blades. Both Hill and this author are undertaking experiments designed to elucidate these points.

Among the outstanding individual types of glass beads are three of bright opaque yellow shaped something like a nail or a stud. (small finds no. B 146.141) They resemble beads found in Medieval Deccan Indian sites such as Kolhapur (Dikshit 1969: Pl. B, 71-73) and Maski (Hyderabad Archaeological Museum, pers. observ.). They also resemble the older beads used on a Muslim prayer strand, known as "Imam" beads.

There was also a torus-folded bead (G.V.1.2315), made by folding a ring or torus of glass around a glass bead to make a continuous wavy line. They were once presumed to be Roman (Neuburg 1949), but their excavation here and at Kilwa (Chittick 1974) strongly indicate that they are Early Islamic.

Two of the segmented beads (B.17.312.2237 and B.F8.367.4181) are gold-glass beads, made by putting gold or other foil on a glass tube and constricting another tube around it to protect the foil. These beads have a pan-European (Callmer 1977:88-89) and pan-Asian (Francis n.d. c) distribution. Some were apparently made in Coptic Egypt (Boon 1966), while some authors believe they may have been made in India as well (Dikshit 1969:56-58; Singh 1983).

Finally, there was one bead made by folding a ribbon of glass around a wire (B.A-11.517.2093), a scarce but persistant type. There is also a bead apparently made by treating a piece of glass with lapidary methods (B.014.679.441).

Our understanding of the glass beads from Siraf is under something of a cloud. The climate and location of the site are ideal for the corrosion of glass, providing high temperatures, humidity, and the presence of salts. As a result, many of the glass beads are heavily corroded. The major exceptions are the Indo-Pacific beads and the "Imam" beads. The bulk of the rest is poorly preserved. Most of the beads have a black encrustation, and while much is yet to be learned about glass corrosion, this seems to be the result of an imbalance in the glass formula, either too much lime in relation to the silica or too little silica in the composition (Griffiths 1980:87).

FAIENCE

Faience is a ceramic product related to, but distinct from glass. It consists of two parts, a core of small silicate particles (usually quartz), which are not melted together but only fused or sintered where they touch, and a glaze, which is a thin layer of glass. Since the coefficient of expansion under thermal conditions differs between the core and glaze, nearly all ancient (and Medieval) faience has lost its glaze and only the core remains. Three methods have been identified for making faience : 1.) Coating the core with a glaze, either as a powder or a slurry, 2.) Mixing the glaze with the core and allowing it to migrate to the surface before firing, and 3.) Forming the cores with the help of some gum, packing them into the glazing mixture, and firing the whole. All three methods were used in ancient Egypt (Tite et al.:1983). The latter method is used today in the city of Qom, Iran (Wulff 1966; Wulff et al. 1968).

The faience beads from Siraf (as well as those from Nishapur) appear to have been made by the method now used at Qom. They are also quite similar to beads excavated at Persepolis (Schmidt 1937:Table III; Persepolis Museum, pers. observ.). The beads are large, crude oblates, suboblates, and roughly gadrooned oblates (melon beads), with large, usually conical holes (modern Qom beadmakers pierce the beads with nails). There appears to have been a long, unbroken tradition of Persian faience beadmaking, as suggested for Nishapur (Francis 1987a:a). To confirm this, however, more detailed microscopic examinations are called for.

That faience is found in Early Islamic Persia is at odds with what had been believed to be the history of the material. Lane (1947:9) and Allan et al. (1973:171) had suggested that faience making had died out there for several centuries, only to be revived in the 12th century. It has also been suggested that the Qom beadmakers came from Egypt in Late Islamic times (Wulff et al.:1968). Siraf has even been cited as proof that not even beads of faience were found in Early Islamic Persia (Allan et al. 1973:171).

However, at Siraf there were 29 faience beads (11.6% of the assemblage), and at Nishapur there were 139, making up a fifth of the collection. In the Siraf context this discrepancy may have been caused by the small finds bags containing faience beads being labeled "frit." While the faience is fritty, it is not frit, the product of heating the raw materials of glass (silica, an alkali, and lime) until they fuse into a solid mass.

There is nothing to indicate that the faience beads were made at Siraf. There is a possibility that Nishapur was a faience beadmaker (Francis 1987a:12). These faience beads are unlike those found at Fustat, and are not found outside Iran. They must have been made for a regional market alone.

MINERALS

Beads of the mineral kingdom were the second largest group, making up about a quarter of the assemblage. The most important single species was carnelian, accounting for 37.1% of the stone beads and 9.2% of all beads. This is the only mineral bead for which we have evidence of local manufacture. Aside from 17 beads, two roughouts (chipped bead blanks), two waste chips, and two small pebbles were uncovered. The pebbles are too small to be chipped and ground into anything but the tiniest of beads; but they may have served for raw material.

Other quartz beads included six of agate, some of which had been altered to onyx, four of chalcedony, three of which are Sasanian seals, and one each of amythist and green jasper. The origin of most quartz beads around the Indian Ocean is Western India (Francis 1982). There are other possible sources as well. Yeman is rich in carnelian and onyx. Al-Hamdani reported on them in the 10th century (Faris 1938:26-27), and they were still being exploited in the 18th century (Niebhur 1774:125). But there is no evidence that Yeman made beads (as opposed to seals and cabochons). Sites around the Persian Gulf, including Siraf, have been reported to have made beads of carnelian (Whitehouse 1975). The Siraf evidence, however, suggests a small and not too skilled industry, concentrated in Locus E, a residential district. Most of the Siraf carnelian beads are too poorly made (e.g. E.S.1.94, E.N.54.2157, and E.S.1.94) to have successfully competed with the western Indian agate industry.

There were also several beads of "Persian" stones. Nine were of lapis lazuli, long extracted only from Badakhshan in northern Afghanistan. In the early 14th century Hamd-Alla Mustawfi reported lapis sources in Manzandaran, Azerbaijan, and near Kerman, but Manzandaran seems unlikely on geological grounds, and nothing is known of any of the sources (Herrmann 1968:27). A turquoise bead and three cabochons, to be set into the bezal of a ring or such ornament, were also recovered. Nishapur was the center of the turquoise industry, and may have processed other stones as well, including lapis lazuli.

ORGANIC MATERIALS

Only an eigth of the beads from Siraf were made of organic substances. Twelve of these are shell, of which six are Conus tops, one is a Dentalium, one is a pendant cut from a nacreous shell, and four others are likely made from the conch (Turbinella (Xancus) pyrum). The Conus tops were made by separating the spire from the base, usually by percussion, and grinding the top down into a short cone or ring. This work was done at Siraf itself.

Thirteen beads of a soft black material were found in Locus O, a cemetary. A stretched piece of black material (C.1.EXT. 9.1240) appears to be the same substance. The material might be bitumen, which is found in southwestern Iran and was used for beads at earlier sites, but it needs to be tested.

There were two beads of precious coral (Corallium rubrum), a major export from Egypt in Islamic times (Goitein 1961:170, 1963:198). It has been suggested that the Farsi word for coral (and pearl) is derived from mard (man; possessor of) and jan or gan (soul or life), with marjan meaning possessor of life, and furthermore that this is the root of the Greek/Latin margarite (Mingana 1925).

A bead marked "pearl?" on the small finds bag (D.3.402) is a much foliated example, with its laminated layers separating. It has apparently been treated with some chemical to stabilize it. Istakheri in the 10th century said Siraf was a major pearl market. Whitehouse investigated several oyster middens in the area, but decided they were late and exploited for food (1972:67). However, it is not necessary that a pearl market be exactly where the pearls are fished.

There was one ivory collar bead. Ivory was heavily used for spindle whorls as well. The collar bead is considered to be an Indian type (Francis 1987b). There were two beads made of bone, which was also used for spindle whorls.

Objects Other Than Beads

In addition to beads, a number of other artifacts were studied because of their relationship to the beads. The largest of this group was waste glass, 98 pieces in all. As we have noted, none of it was evidence for beadmaking. The glass, mostly translucent "bottle" green and cobalt blue, was probably used to make vessels. About three quarters of the wasters came from Locus D, the site of a glassworking kiln.

Eleven objects studied are glass but not Early Islamic beads. Three are cabochons, to be set into metal jewelry. Six called "abacus beads" on the small finds bags are plano-convex or plano-conical in shape and much closer to the class of spindle whorls (Liu 1978) than abacus beads (Francis 1985). Two glass beads are modern, one probably from 17th century Holland (Francis 1988: color pl. L14), and the other 19th century Venice (Ibid.: B13).

The universality of modern intrusions into older bead assemblages highlights the need for researchers to be aware of and familiar with later trade beads, even if only interested in earlier beads. The number of intrusions at Siraf is small, about one percent, including a plastic bead recognized by the excavating team. At Nishapur it was 3.3%, and caused some problems with ascription (Francis 1987a:2, 21-23).

A group of 39 spindle whorls (9.7% of all objects studied) included 21 of ivory, twelve of bone, and six of one or the other material (this does not include the six of glass mentioned above and one of amethyst, counted as a stone bead, B.2.11.416). Spindle whorls are small, round perforated objects put on sticks (spindles) to lend rotary momentum for the spinning of thread. They are commonly listed as, mistaken for, and grouped with beads. Typologically, they are usually well centered around the axis and have uneven profiles, with larger perforations than most beads (Liu 1978). The question as to whether spindle whorls were worn as beads in the past has been discussed (Francis 1987d). It is most interesting that at Fustat a mosaic glass bead was found strung on a hempen? thread along with three highly decorated bone/ivory spindle whorls, presumably worn as beads (Scanlon 1988; Corning Museum Accession No. 71.11.1). 1987b

Most of the spindle whorls from Siraf were highly incised, often with the circle/dot motif and zones. One of the ivory and three of the bone ones had birds, and three whorls had trees. One of ivory had been covered with ochre, and a bone one had the remains of an iron pin in its perforation!

Five fragments of conch (probably Turbinella pyrum) were found, either part of the spire or the lower base and columella. The pieces removed would have been used to make shell bangles. Beads may also have been made from the waste, especially the columella.

Eight vertebrae of some large fish were recorded as beads, but only one had been actually ground into a large disc bead. Although the unworked examples have lost their spines and have small holes in the center, both conditions can and do happen without human agency. It cannot be said whether these bones were raw material for beadmaking.

Siraf and the Bead Trade

Our discussion of the bead materials included notes on the origin and manufacturing techniques of the beads. We need now consider how the beads arrived at Siraf. This analysis should be especially important in the light of our interest in the bead trade of the Indian Ocean.

Any site having beads is bound to have one or more of the following characteristics in relation to them: producer, consumer, importer, and exporter. There are several permutations among these categories. Hence, a producer may not consume, an importer may re-export, etc.

Rather few beads were made at Siraf. They include some of the carnelian and most of the shell, and possibly those identified as bitumen. Along with the pearl, they amount to only 12.9% of the assemblage. At least 166 beads or 66.1% were imported.

One group of imports may have been destined for re-export or transshipping: the Indo-Pacific beads. We base this assumption on two lines of reasoning. The beads were made at Mantai, Sri Lanka, and reached the entire East coast of Africa and penetrated far inland. Siraf plied the Ino-Chinese route on which Mantai was a major stop, and to have traded to Zanzibar and Madagascar. The second is negative evidence. Indo-Pacific beads do not seem to have been popular in Persia. None were found at Nishapur, and they are (or were) rare on the Iranian antiquities market (pers. observ.).

If we assume that the Indo-Pacific beads were destined for East Africa, we may suggest that a locally made bead went with them -- the Conus shell top discs or rings. Such ornaments have long been popular in East Africa, where tey were in use at least by the 16th century, when the Portuguese began to import them there, apparently as part of an established trade (Harding 1961:52). It will be interesting to learn if we are seeing the opening of that trade at Siraf.

Bearing these judgements in mind, we can calculate the statistical profile of the Siraf bead trade. We can compare that with the Nishapur material (assuming the jet and faience were locally made and the etched carnelians exported), but the data for Fustat is not accurate enough to be computed. The results are in Table 2.

TABLE 2

The Bead Trade at Siraf and Nishapur (in %)

Characteristic	Siraf	Nishapur
Locally Consumed	58.3%	81.3%
Locally Manufactured	10.5	53.6
Imported for Consumption	47.8	27.7
Exported	21.1	0.9
Manufactured for Export	2.8	0.9
Imported for Re-export	18.3	-
Total Involved in Trade	68.9	28.6
Unclassified	21.0	17.8

Siraf was clearly more active in the bead trade than was Nishapur. At Nishapur over half the beads were locally (or regionally) produced and consumed, while at Siraf nearly half the beads were imports for local consumption. Siraf exported more than 20 times the percentage of beads that Nishapur did.

The beads found at Siraf came from many different places. From the east came turquoise (Nishapur), lapis lazuli (Afghanistan), the yellow "Imam" beads (Maski, India), and the Indo-Pacific beads (Mantai, Sri Lanka). From the west came coral (through Egypt), the torus-folded bead, and an impressed eye bead (B.H.15.329.4182), and probably other glass beads as well. Exports (the Indo-Pacific beads and possibly the Conus shell tops) seem to have been aimed at East Africa.

Although the trading patterns in beads are very different between Siraf and Nishapur, and the composition of their assemblages are very different (see Table 1), strains of similarity can be seen. A group of five bead types are found not only at these two sites but at Fustat and Mantai as well. They formed staples in the western sector of the Indian Ocean bead trade. They are: coral (from the Mediterranean and traded through Egypt), lapis lazulim(from Afghanistan, but with the lapidary center not yet identified), gold-glass beads (whose center or more likely centers of manufacturing are not known), and carnelian and onyx (overwhelmingly from western India).

The Use of Beads

Beads fulfill a host of purposes, the most common being human adornment, quickly followed by the decorating of nearly anything from an automobile to a zebu. Beyond that, beads may serve as counters (prayer strands, abacus), weights, seals, currency, as tokens of status, mnemonic devices and bearers of messages, and a host of other applications.

Our understanding of the use of beads clearly depends upon their contexts. Since no beads at Siraf were found in such a context (such as a burial), we must rely upon the characteristics of the beads themselves, our understanding of Early Islamic Persia, and a preliminary locational analysis.

One use of beads that we may consider is in regards to the superstition of the Evil Eye. This belief is particularly strong among Muslims and very evident in Iran. The fear of someone with "the Eye" causing misfortune to those who receive its glance is alleviated by wearing two classes of objects, those that repel the eye and those that attract it to a harmless object. In the latter group are many minerals, especially the chalcedonies (Budge 1961:306-320), the color blue (Allgrove 1976:45), and any eye device, including the circle/dot motif. In the former group are hand representations that can poke the eye out: hands, stars, horns, crescents, and phalli. This widespread superstition (see Maloney 1966) is believed to be recorded in the Coran itself. "The Pen" (Surah 68, lines 51 ff.) has been interpreted as meaning:

> The unbelievers wellneigh strike you down
> with their glances, when they hear the
> Reminder, and they say, "Surely he is
> a man possessed!
>
> Arberry 1964:601-602

When the beads from Siraf with one or more characteristics of eye amulets are tallied (counting each bead only once), no less than 30.4% of them could have been used for this purpose. When the spindle whorls are figured in, the percentage is even higher at 36.1%. Although slightly lower than the figure for Nishapur (44.2%), it is within the same order of magnitude, and is clearly significant. Of course, not every bead with such characteristic need have been used only as an eye amulet, but the popularity of the belief would mean that many would have been selected for this use. The figure for Siraf may be a bit conservative, as many of the corroded glass beads may have been blue or had eye designs.

One group of eye amulets calls for attention. It is included because the beads are always blue: the faience beads. As at Nishapur, they made up a large percentage of the Siraf assemblage. Similar beads are known in Iran for a period of some 1500 years before and after these sites were occupied. They are very crude. Their shapes are quite irregular and the common form of decoration (gadrooning for melon beads) is poorly done. Persia never seems to have dared export these beads. The best customer for the modern Qom faience beadmaker is the farmer, who puts them on his donkey and other livestock, all of which may be subject to the baneful influence of the Eye. It does not seem too much to suggest here that this, and probably only this, was their ancient use at Siraf and elsewhere in Iran.

One bead also counted in this group is a cornerless cube, a cube with the eight corners ground off, of green jasper (F.10.4.2191). Schienerl (1985) has suggested that this particular bead is used against the Evil Eye among the Bedouin, and has asked for parallels. The shape is found in Harappan times in India, but only became popular in the late centuries B.C.; now it is widely used, and green jasper ones were known from Iran (Francis 1986). The Siraf example is the first one known to be excavated, although its presence at Siraf does not necessarily confirm its use as an eye amulet. 1986

Another amulet found at Siraf is a round disc of faience decorated only on one side or face with a wavy edge, and having holes or depressions punched in the center of the face. These are common in the Muslim world, and are thought to have been derived from Roman prototypes (Schienerl 1982). One at Nishapur had six holes (five surrounding one), while two at Siraf have only two holes, and one other the more common seven (six surrounding one). The variation in these early examples in the number of holes leads one to think that their development to the common configuration of today (seven) was more complex than had been thought.

The Location of the Beads

The spacial context in which beads are found, particularly their relationship to certain archaeological features, may furnish clues to their use and their participation in the systemic (living) context of the site. Detailed data on the site will be published soon by Whitehouse, but in the meantime his exemplarary interim reports provide enough data for some preliminary conclusions.

All loci except H, I, N, and P yielded beads, but the quantities varied greatly. Locus J, some sort of military storage area, had only one bead, while Locus B, the Great Mosque, had 130 beads and spindle whorls, about half of the total assemblage. Several carnelian beads, and unfinished disc bead, both roughouts, and a chip were found in Locus E, pointing to the site of a beadmaking shop in a residential district. The kiln area, Locus D, produced few beads as might be expected from an industrial site.

The concentration of beads in and around the Great Mosque calls for some discussion. The area was given considerable attention by the excavators, which might help account for the large number of beads. Some beads may be pre-Islamic. The mosque was built over the site of a Sasanian fort. It was built over five stages (Whitehouse 1970:2-8). Many of the beads may have come from infill, but this probably was found near the mosque itself. At least three beads from this area are Sasanian: a domed seal of chalcedony engraved with a ram, a tree and a crescent (B.E3.538.453), and a flattened dome seal in tan chalcedony with a sketch engraving of what is supposed to be Gayomard and Yellow Ears (B.F.1-14.603.433). This latter seal may have been an amulet of some kind (Francis 1987c; Harper 1985). A third seal from Siraf has not been seen by this author (see Whitehouse 1972:pl. XII d). It is apparently of chalcedony with a deeply engraved Gayomard flanked by a crescent and a six pointed star. Yellow Ears is absent, and Gayomard8s phallus is erect.

Since all the shell bangle wasters and half the shell beads were found around the mosque, at least one shell beadmaker was probably located nearby. The large number of beads and occurrence of similar beads suggests some sort of storage or processing area. For example, 80% of the segmented beads were found here, including all eight examples of a particularly fine type, with a hollow cylindrical body and well finished ends (see B.H3.313.3746). Both coral beads were found here. On the other hand, only a quarter of the Indo-Pacific beads were. We might suggest that both segmented and coral beads are more suitable for prayer strands than the small Indo-Pacific beads. Mosques as sites of bead shops is a common feature in the Middle East. One need only recall that Mecca is a famous bead mart to realize that the connection between beads and Islam is very old. It is hoped that work on other sites will bring this nexus into sharper focus.

To summarize what we have said about bead use at Siraf, about half of the beads can be ascribed some use. These include Evil Eye amulets for humans (17.1%) and for animals (11.2%), and those for export (20.7%), and used on a prayer strand (the "Imam" beads, 1.2%). Other beads may well have also been used on prayer strands. It is noteworthy that no spacers (with multiple holes to keep strands apart) nor Muslim pendants (such as charm case beads, found at Nishapur) were uncovered at Siraf.

The Disposal of Beads

The manner in which artifacts leave the systemic context of a site to enter the archaeological is not extensively considered (but see Schiffer 1976). It is, however; of interest, because this reflects the final act in which beads participated in human behavior. The question is being considered in relation to beads (Francis n.d. d), and we may consider some of the issues involved in regards to Siraf.

In general, four mechanisms account for beads in the archaeological context: deposition (in a burial, an offering, a cache, or a foundation deposit), discard (when broken or worn or out of fashion), loss, and abandonment. Disposition and abandonment are static events usually happening only once. Loss and discard are diachronic events, adding to the total number through time. The "loss" category has a built-in negative feedback. Showy, bright, and above all valuable (whether intrinsic or cultural) beads are scavanged and are recycled into the systemic context. Thus, we assume that the average size, value, and attractiveness of beads excavated is lower than that actually worn at the site. Conversely, these characteristics are on the average higher in value for beads purposely deposed.

At present we can only recognize two categories archaeologically. Beads which have been deposited are associated with certain archaeological features. Broken and heavily worn beads may be assumed to have been discarded. No deposited beads were found at Siraf. Ten percent were broken.

More meaningful than the figure of ten percent, however, is a datum telling us the rate by which beads were discarded. This can be calculated based on this formula:

$$A = \frac{b}{ty} \times 10^4$$

in which A is the rate of accumulation of discarded beads expressed in percentage of the assemblage per century, b is the number of broken beads, t is the total number of beads, and y is the number of years the site was occupied.

When this is computed for Siraf, figuring 500 years of occupation, A = 1.99. That is, disposal accounted for about two percent of the accumulation of beads per century. A similar figure is found for the imported (consumed) beads at Mantai, where A = 1,69. The low figure for Nishapur (0.46) is probably on account of half century old techniques used by a team excavating for an art museum, when broken beads and fragments were not considered of great importance. More sites need to be examined to see if there is any average or "usual" rate.

Summary and Conclusions

As with all things, the beads of Siraf cannot be studied in isolation. We have; therefore, considered them along with those from Nishapur, Fustat, and Mantai as part of the western sector of the Indian Ocean bead trade. This region appears to have been largely self-sufficient. Although there was trade with Africa, India, and Scandinavia (through Nishapur, exporting etched carnelians and importing amber), there is no evidence of trade with Western Europe or the Far East (except at Mantai).

The trade was controlled by the Persians and the Sea-faring Arabs. Their sources were largely internal. Among the five staples of the trade, the coral and lapis lazuli were available in Muslim lands. We are not sure of the source(s) of the gold-glass beads. Shortly after our period of concern here (ending in the 12th century), the Muslims took over the western Indian agate bead industry by capturing Cambay and the trade and eventually the sources of the stones and the lapidaries. (Francis 1982; 1986b). 1986c

Siraf was heavily involved in this trade. It was a major carrier of beads, helping to open the trade in Indo-Pacific beads to East Africa, and possibly the Conus shell top trade as well. The great bulk of Siraf beads were being traded in one direction or the other.

The beads of Siraf differ from those of contemporary Nishapur. There were no beads of jet, and glass was most important at Siraf. Both sites had considerable faience and the profile of their mineral beads were similar. The two sites show similar ideological contents in terms of the eye amulets, though somewhat stronger at Nishapur. In terms of "Islamic" beads, however, Siraf was very poor, perhaps reflecting a non- or nominal Islamic community there.

In sum, at this preliminary stage, the study of the beads from Siraf tends to bolster most of the assumptions made about the site by Whitehouse and others. Siraf was not a great beadmaker, but a vital link in the international trade in these universal ornaments.