ORNAMENTATION AND INTERCULTURAL CONTACT IN THE EARLY BRONZE AGE: A PRILIMINARY STUDY OF THE BEADS OF RAS AL-JINZ, OMAN

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CONTENTS

I. Introduction

The study of beads can provide unique insight into many aspects of ancient cultures: chronological trends, aesthetic movements, supernatural beliefs, technological capacity, and external contacts to name a few. But despite their utility, beads have long been an under-appreciated part of the archaeological record, especially in the Near- and Middle-East. Over 11,000 beads have been recovered from two Early Bronze Age (EBA) sites on the eastern coast of Oman, RJ-1 and RJ-2, during the last 20 years of excavation. Yet, in all the literature documenting the sites at Ras al-Jinz, beads are barely mentioned. This preliminary study reveals that, in addition to confirming the existence of contact between the Umm an-Nar and foreign civilizations, the bead record of Ras al-Jinz gives insight into the cultural and economic relationships wrought by such contact.

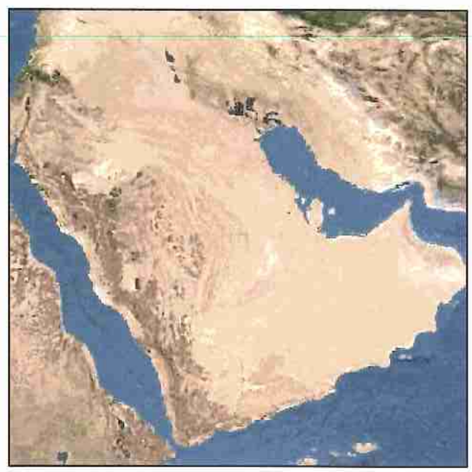

Figure 1: Satellite image of the eastern end of the Arabian Peninsula and the surrounding region.

RJ-1 and RJ-2 are part of a cultural complex which stretched across the north-eastern end of the Arabian Peninsula called the Umm an-Nar. The product of approximately 500 years of economic exchange between overseas civilizations and the preceding 4th millennium Neolithic and early 3rd millennium Hafit communities, the Umm an-Nar have long been recognized as engaged in foreign commerce. With a well documented precedent for external contact and a wealth of bead artifacts at Ras al-Jinz, this site was an optimal location for analyzing the significance of external contact through the bead record.

The processes involved in analyzing beads differ from those used to examine other archaeological material. Though well-known techniques like typology and chemical analysis are the bases of investigations, several complicating factors unique to beads necessitate multiple layers of investigation and analysis before one is able to fully understand a bead assemblage. Limited to basic, but fruitful, exploratory methods, this investigation is intended as a preliminary step for broader research.

Examination and documentation of carnelian, heated steatite and faience beads, along with the stylistically or technologically exceptional beads of local materials, result in a broad range of external associations. The overall poor quality of the assemblage, a consistency in shape and size of paste cylinders, and indications of percussion perforation on carnelian discs are all significant patterns within the collection. Furthermore, some individual beads seem to be direct imports while others are fusions of both domestic and alien traditions. Considering these observations in the context of the EBA Middle Asian Interaction Sphere, one may draw some important inferences about foreign contacts and their implications.

Such manufacture and design trends in the RJ-1/RJ-2 collection of beads serve to both solidify the cross-cultural interaction between the Umm an-Nar and other regional centers and broaden the scope of that interaction, as both an economic exchange and a cultural dialogue in aesthetic and symbolic terms. Certainly an understanding of the bead record is an important step in the ongoing process of discerning a detailed view of the Middle Asian Interaction Sphere and its influence in the development of regional cultures.

II. Background Information

The goal of this research project is to determine what significance the beads of RJ-1 and RJ-2 have with respect to the intercultural contacts of the Umm an-Nar people. However, before beginning, a common understanding must be reached regarding who the Umm an-Nar were, where they came from, and what the regional context was in which they existed. Following the contextualization of the larger culture, the beads themselves must be contextualized within the sites where they were recovered. Finally, in preparing to undertake an examination of a bead assemblage, it is useful to define the subject and review previous methods of analysis and interpretation.

Figure 2: Photograph of RJ-1, an Umm an-Nar tomb, with walled chambers visible

II. A. The Umm an-Nar

II. A. 1 Origins

During the third millennium BC, a complex culture developed on the eastern end of the Arabian Peninsula [Figure 1]. Born from the loosely associated, Neolithic populations of the fourth millennium BC, a culturally cohesive community developed in response to increasing foreign commerce (Cleuziou and Tosi 1989: 17). While terminologies regarding these peoples have been debated, two major cultural periods have been identified using burial cairn types. The community that is identified by compartmented burial cairns in the mid- to late-third millennium BC is the primary subject of this investigation and will be called the Umm an-Nar culture throughout the course of this thesis [Figures 2 and 7]. Preceding the Umm an-Nar was a culture characterized by single chamber tombs, referred to as Hafit.

The Hafit cultural complex is identified with the origins of cairn burial just before 3000 BC. There are over 100,000 of these single chambered tombs in Oman (Cleuziou, personal communication 2006). They can reach up to seven meters in height and are characterized by varied block dimensions on the surface of the exterior walls [Figures 3, 4, 5, and 6]. This period lasted a few hundred years, until approximately 2700 BC (Cleuziou and Tosi 1989:Table 1), and experienced some, but limited, external contacts with Mesopotamia, in Iraq, and Elam, in Iran (Cleuziou and Tosi 1989:Table 2). The relatively isolated oasis, mountain, and coastal sites and the inconsistency of cultural modifications indicate a rather disassociated population.

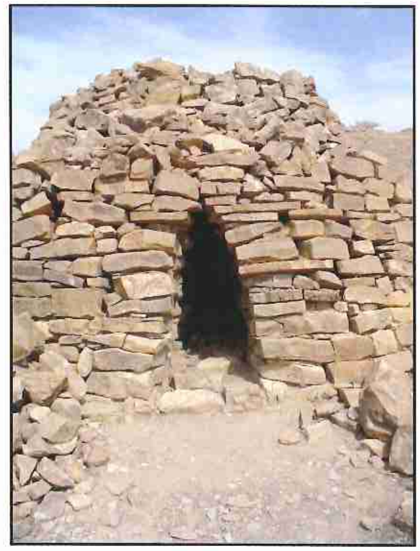

Figure 3: An unexcavated Hafit tomb at Bat, Oman.

Figure 4: Hafit tomb (Image from Olivia 2005)

Figure 5: Row of Hafit tombs along a ridge (Image from Olivia 2005)

Figure 6: Close up of Hafit type tomb exterior wall at Bat, Oman. These uneven blocks contrast the nicely squared blocks of Umm an-Nar tombs (see Figure 3).

Figure 7: Close up of Umm an-Nar type tomb exterior surface at Bat, Oman.

The Umm an-Nar culture was first identified in the early 1960's on an island of the same name off the United Arab Emirates' coast (Tosi 1976). Since then, it has been identified throughout the UAE and Oman, from Jabal Emaleh in the north to Ras al-Jinz in the east and Wadi al-Batha in the south (Cleuziou my docs. Pg. 4; Cleuziou and Tosi 2000: Figures 1 and 2) [Figure 8], and, though its geographic range may be smaller than other coexisting civilizations, the diversity of environment that the Umm an-Nar inhabited was exceedingly large. The Umm an-Nar people were inhabitants of mountains, deserts, oases, and coasts, and, as such, they farmed, fished, and herded for subsistence.

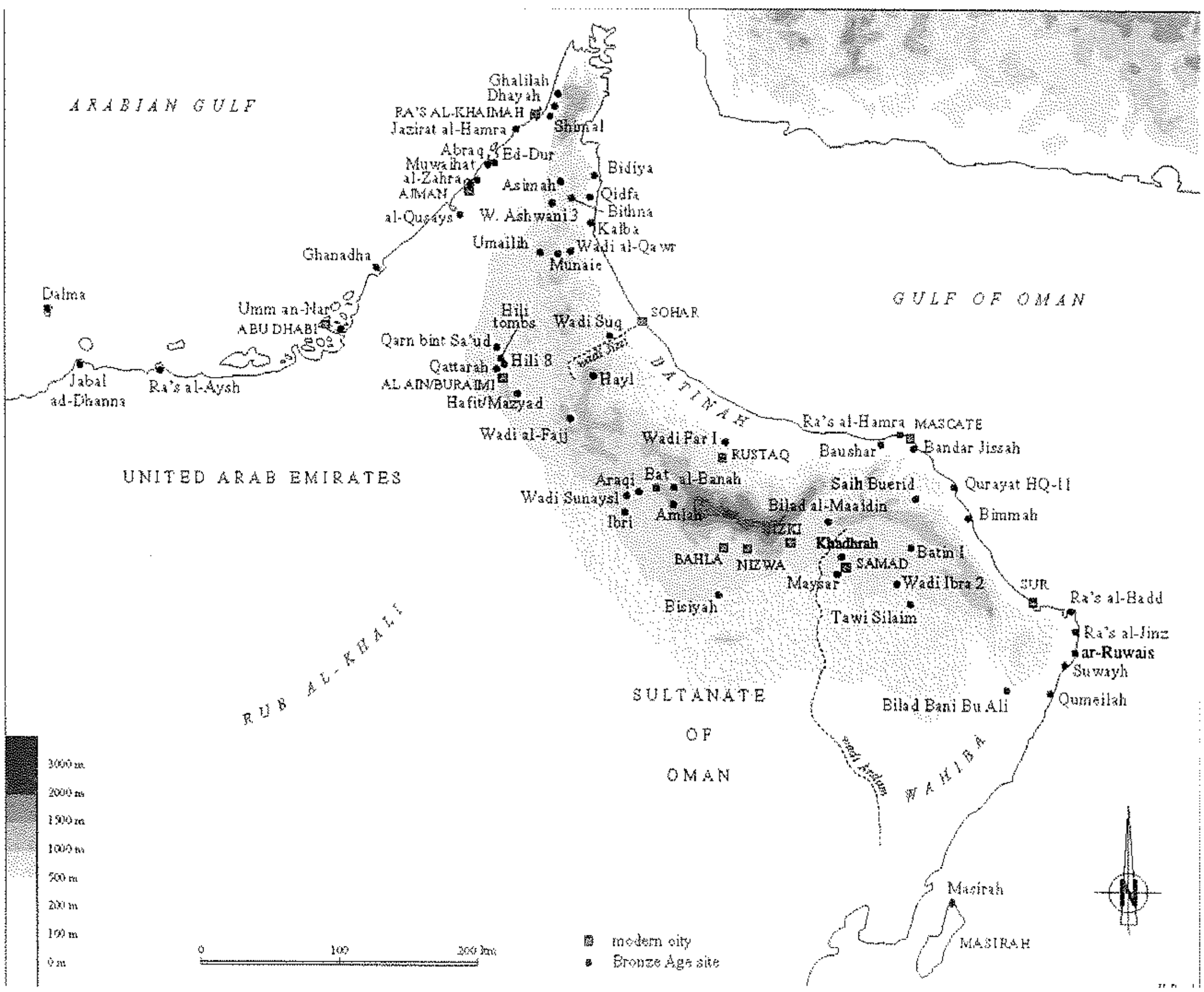

Figure 8: Map of Oman with EBA sites marked (Image from Cleuziou and Tosi 2000)

As a response to the harsh environments of Eastern Arabia, with only seasonal maritime resources because of the summer monsoons (Cleuziou and Tosi 2000:41), the Umm an-Nar people are thought to have migrated between small coastal communities in the winter, when temperatures were reasonable and fish were plentiful, and larger mountain settlements in the summer, where they herded and cultivated dates (Cleuziou and Tosi 2000:67). Adept at multiple occupations, individuals and subgroups of the Umm an-Nar participated in seasonal subsistence economies while producing commercial goods in environmentally exploitive cottage industries (Cleuziou and Tosi 2000:68). These habitation and economic patterns, as preserved in modern *bedu* communities, are conducive to a craft-generalized egalitarian socio-economic network (W. Lancaster and F. Lancaster 2002: 239, 251-252). Preserving open access to communal resources, ancient and modern Omanis distinguish themselves from highly organized and stratified state societies while maintaining mutually beneficial economic and cultural exchange relationships.

Since its first identification, the Umm an-Nar culture has been acknowledged as the product of a relationship between the earlier populations, both fourth millennium and Hafit, and the more structured and technologically advanced civilizations of their day.

II. A. 2. Development and Intercultural Contact

The first stage of interpreting the origins and development of the Umm an-Nar culture was from a typically Mesopotamia-centric view. The most extreme manifestation of this bias was a short-lived hypothesis that the culture on the eastern end of Arabia was a Mesopotamian copper exporting colony (Cleuziou My docs: 4). This and other development theories based in a cultural dependency on Mesopotamia were founded on cuneiform texts. Oman was identified as the land of Magan (a.k.a. Makkan or Majan) of "Dilmun, Magan, and Meluhha," the triad of

Mesopotamian trade as enumerated in several texts including one by Sargon of Akkad (Possehl 1996:133) [Figures 9 and 40]. Like Magan, Oman was a source of copper and olivine-gabbro, and it lies geographically between Bahrain and India which were identified as Dilmun and Meluhha, respectively (Possehl 1996:134).

These claims of an Umm an-Nar development motivated by external, specifically Mesopotamian, investment were reinforced as ceramic finds at Hili and in the Jebel-Hafit cairns showed significant Mesopotamian content. Jemdet Nasr pottery was recovered from graves in the Omani Jebel (Cleuziou and Tosi 1989), and more Mesopotamian pottery, spouted vessels with cylindrical necks and pear jars, were discovered at Hili 8 (Cleuziou my docs:9?). At Hili, 69% of the diagnostic sherds recovered were of Mesopotamian origin (Cleuziou my docs:4). This perception of the Umm an-Nar culture as a subsidiary of the Mesopotamian center conformed well to the intellectual trends of the time—focusing solely on Near Eastern development.

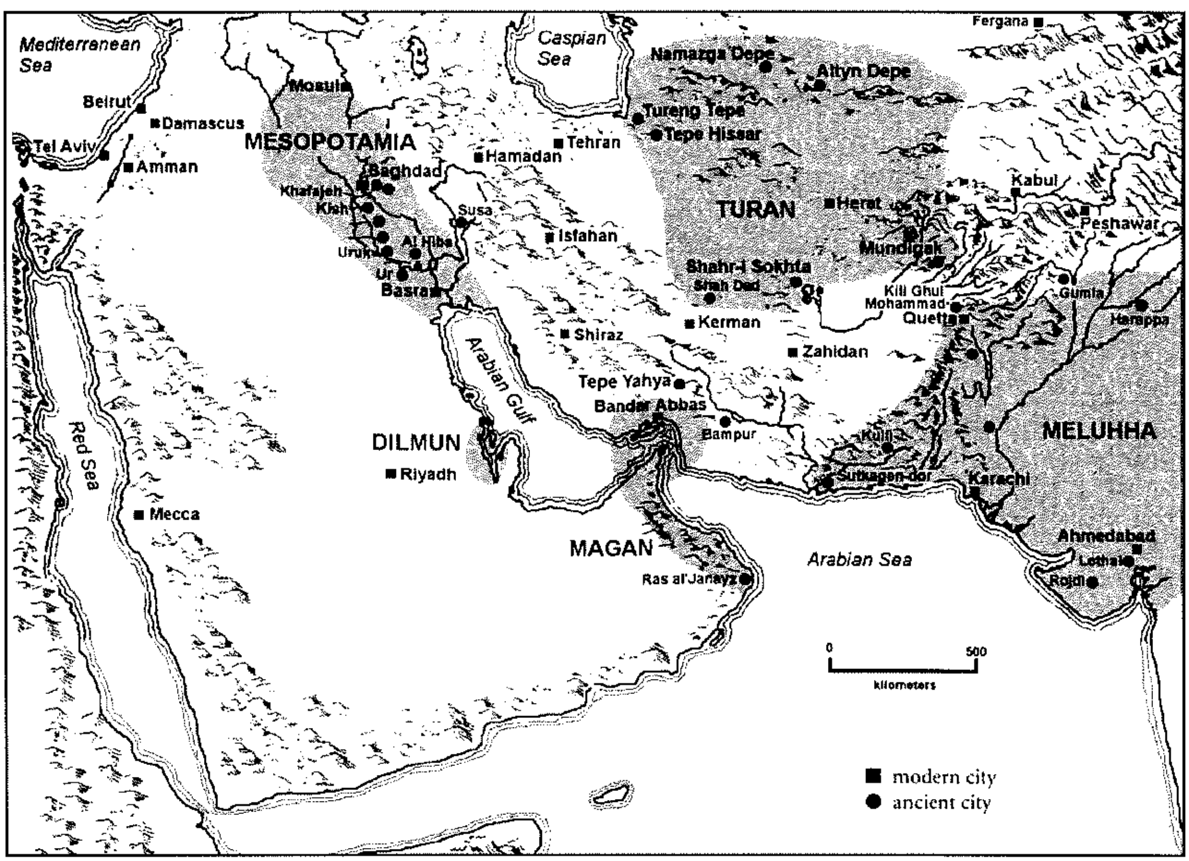

Figure 9: The Middle Asian Interaction Sphere stretched from the ancient Near East to the Indus. (Image from Possehl 2002:215)

However, as the archaeological community began to reorganize traditional models of power and trade in the Early Bronze Age, additional materials in Arabia demonstrated a connection with these newly recognized trade networks. Elam and the Indus were identified as significant contributors to the society developing in Eastern Arabia. At the site of Umm an-Nar, B. de Cardi made associations between excavated ceramics from cairn I and material from her own test trenches at Bampur (Tosi 1976: 83). Tosi (1976) later added material from several other Umm an-Nar cairns and Wadi Samad to the list of Elamite ceramic associations and related them further to Shahr-i-Sokhta. He then used these associations to date the Umm an-Nar to the end of the third millennium BC.

Two external factors contributed to the Iranian influence in Oman. First, pursuant to the Mesopotamian copper-export theory, Elamite copper miners and smiths would have been drawn to and needed in Oman as the copper industry shifted from Iran to Oman. This theory is supported by the fact that pyrotechnology and ceramic industry were the first substantial imports into the developing Arabian community (Cleuziou my docs:7). The second contextual factor which contributed to the Elamite influence in developing Oman was the relatively high degree of social and economic organization that was present in Elam at the time. It is no coincidence that the majority of Elamite influence occurred during the "highest peak of urban development in eastern Iran" (Tosi 1976: 91). That was the time when Elam had the internal organization to have regional influence.

A dramatic shift in the Indus, during the second half of the third millennium BC, completely restructured the regional economy. As the once inland communities of the Early Harappan moved toward the sea between 2600 and 2500 BC, their trade contacts multiplied and cultural interaction flourished. Participating in what has been labeled "The Middle Asian

Interaction Sphere," [Figure 9] the Mature Harappan civilization utilized revolutionary new seafaring technologies to reach other cultures and spread their own (Possehl 2002:215). This change is visible in the archaeological records of the Umm an-Nar.

Indus economic involvement in Oman is manifest with the inclusion of Indus materials in several Omani excavations. Cleuziou reports a "high frequency of imported Indus pottery. . . well over 40%" at Ras al-Jinz, period II (my docs pg 16-17). In fact, the find which instigated excavation at Ras al-Jinz was a potsherd with Indus script uncovered on December 25, 1981 during a brief reconnaissance mission to the Ras al-Hadd seaboard (Tosi 1982:1). Since then, additional Indus ceramics have been recovered from site 2 of Ras al-Jinz (RJ-2). These and other recovered Indus materials suggest that overseas contacts were important factors in the increasing prominence of coastal settlements, like those at Ras al-Jinz and Ras al-Hadd, in the period leading up to the Wadi Suq, Middle Bronze Age.

II. B Ras al-Jinz (RJ-1 and RJ-2)

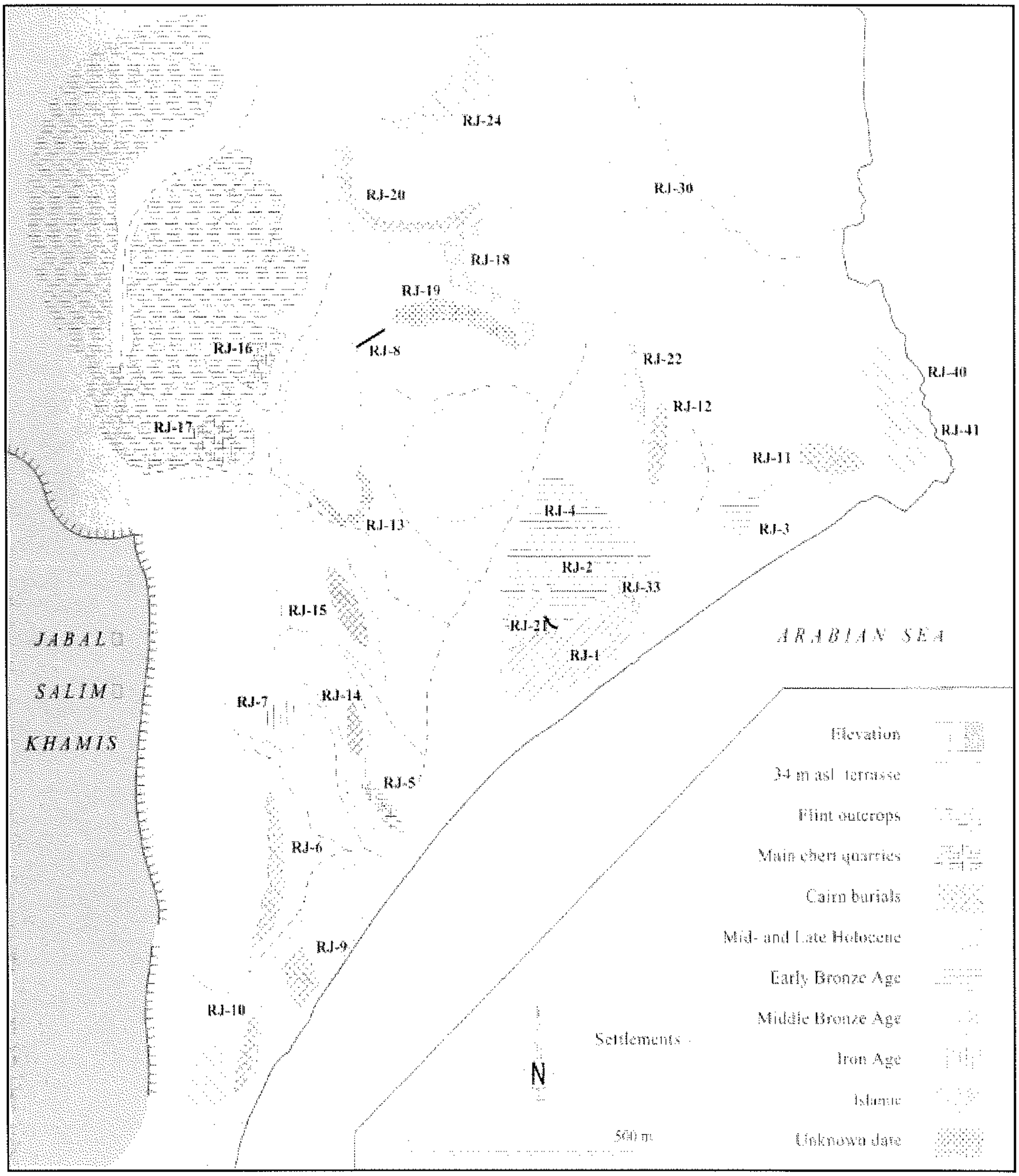

Figure 10: Map of the Ras al-Jinz embayment with main sites labeled (Image from Cleuziou and Tosi 2000:25)

Figure 11: Aerial photograph of the RJ-1 mesa with Rj-2 in the foreground. For more contextual imagery see Figures 11-14. (Image from Cleuziou and Tosi 2000:Plate 1)

II. B. 1 Geography

Ras al-Jinz, most geographically notable because it is the easternmost point on the Arabian Peninsula, is a "low tabular headland" (Cleuziou and Tosi 2000:19) with an arid climate [See Figures 11 and 12]. Resting between the impressive Jabal Salim Khamis and the Indian Ocean [Figure 10], this community is well-situated to exploit both internal and external contacts. The limited ancient, and modern, populations were, and are, sustained by exploiting the abundant marine biomass and maintaining healthy contacts with the nearby port and agricultural communities of Ras al-Hadd and Wadi al-Batha, respectively (Cleuziou and Tosi 2000:19). The 15-30m high cliffs, which line the coast to the north and south, have been eroded at Ras al-Jins by runoff from the mountains, forming a wide, deep embayment on whose border RJ-2 sits. RJ-1 rests atop the prominent mesa between RJ-2 and the sea.

Figure 12: Distance photograph of the Ras al-Jinz headland.

II. B. 2 RJ-2

Third millennium BC RJ-2 is composed of twelve mud-brick buildings, mostly divided into two compounds: northern and southern [Figure 13]. Preceded by a 4th millennium site, the first phase of habitation in the 3rd millennium, beginning with the construction of the Southern Compound, is labeled Period II and dates to 2500-2300BC. Period III is defined as starting with the construction of the Northern Compound. Radiocarbon dates place this around 2300BC, and the period lasts until the construction of Building IV around 2100BC. The site is abandoned before the Wadi Suq period begins at the turn of the 2nd millennium BC. (Cleuziou and Tosi 2000:28)

This site provides a wealth of material and information about coastal Umm an-Nar settlements. Rich in Indus materials, RJ-2 has been crucial in developing theories of trade and overseas contact. Bitumen remains in Buildings I and II (Cleuziou and Tosi 2000:63) have directed recent projects for overseas boat reconstruction (for more information see Vosmer 2000 or Cleuziou and Tosi 1994). When they were not occupied with their main occupation, catching and processing fish, the people of RJ-2 operated several smaller industries based on local resources. They manufactured Pinctada rings; mined, crushed and packed pyrolusite (for eye make-up); and collected and cleaned *Fasciolaria* conch shells (Cleuziou and Tosi 2000:68). These material products provided the inhabitants of Ras al-Jinz additional goods with which to engage in trade. Lamps or spouted drinking cups made from the *Fasciolaria* shells have been found in the Royal Graves of Ur (Cleuziou and Tosi 2000:68). Though it was a simple fishing village, the archaeological remains depict a population at RJ-2 which not only had access to developing regional networks but was exploiting those networks for its benefit.

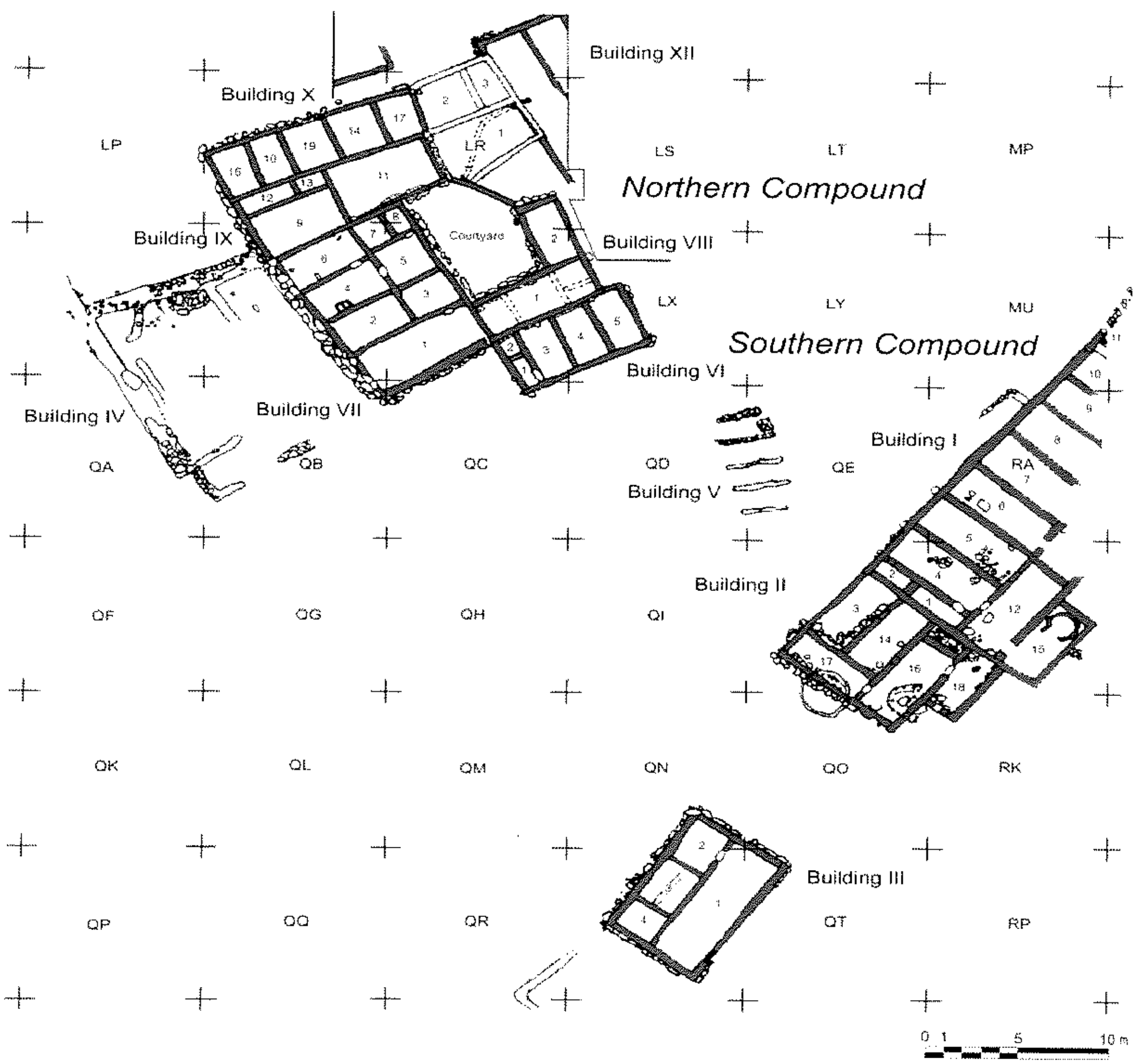

Figure 13: Map of the mud-brick structures of RJ-2 (Image from Cleuziou and Tosi 2000:32)

II. B. 3. RJ-1

While the main settlement on RJ-1 was from the Wadi Suq period (2nd millennium BC), and a few Hafit tombs dot the southern end of the mesa, the feature from which the RJ-1 beads come is an Umm an-Nar tomb. Named Tomb 1, this burial cairn has 8 chambers and three associated bone pits [Figure 14]. The whole burial is provisionally dated to 2600-2400BC (Cleuziou, personal communication 2006), but the relative dates of the bone pits have yet to be determined. The more than 20,000 bone pieces recovered from the tomb and pits represent all demographic groups relatively equally: men and women, old and young. The only group nearly absent were infants, 0-5 years in age. This tomb was voluntarily destroyed and filled with yellow clay. When removed from the tomb, the bones were placed in unusual configurations in the nearby bone pits. 28 skulls were found stacked atop one another and long bones were arranged in polygonal shapes. The removal of the bones for burial in separate pits and the destruction of the tomb are both puzzling events which suggest complicated rituals surrounding death.

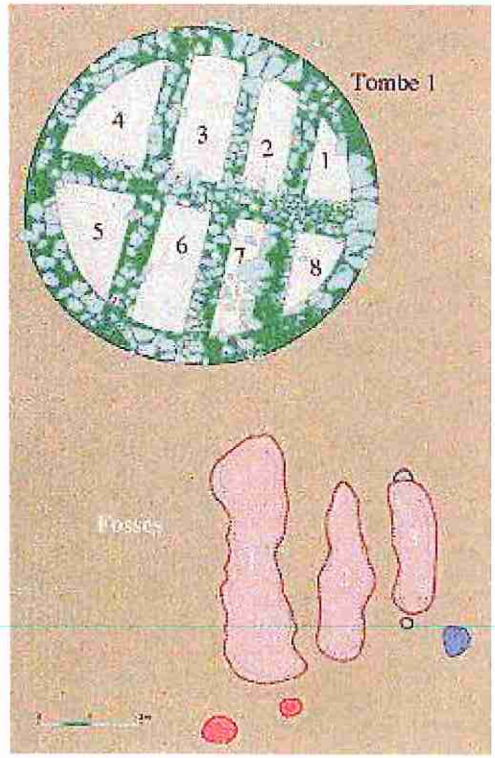

Figure14: Diagram of Tomb 1 and associated bone pits. (Image from Olivia 2005)

II. C Beads

II. C. 1 Definition:

A bead is any object perforated along an axis for threading or stringing, usually worn on clothing or as ornamentation. The earliest beads date to 38,000 B.C. from the site of La Quina in France (Durbin 1987:21); making beads the oldest form of aesthetic expression known to man. Beads represent the very origins of the uniquely human capacity for abstract thought (Kenoyer 1986: 18). Non-functional (in terms of acquiring food), they operate, rather, as cultural markers and vessels. For forty thousand years they have been used by nearly every human culture for symbolic purposes including, but certainly not limited to, beautification (Durbin 1987:18). They have been expressions of wealth, mystical talismans, markers of membership in particular communities, markers of social status, and ritual objects. Because their functions vary widely between, and even within, cultures, studying, analyzing, and interpreting the archaeological record through beads requires specific and unique techniques.

Before undertaking an analysis of a bead assemblage, one must recognize how completely different beads are from other parts of material culture. Unlike pottery, beads have extremely long periods of evolution. Chandra observes, "Beads . . . do not record change of fashions too frequently . . . Even today we find that the pearl necklaces of our grandmother's day are still in fashion" (1964:57). Perhaps their relative longevity is due to the large amount of time and skill required for production and, consequently, the proportionally higher amount of wealth they represent. A set of beads will be passed from generation to generation, being reworked into new beads when the old ones break, and a style of bead can remain in production and in use indefinitely (Dubin 1987:315).

Beads can be made from a plethora of different materials, from bone and shell to fiberglass and aluminum, with manufacture techniques that range from no effort at all, in naturally occurring beads, to the most complex Art Nouveau styles of modern times. New York jeweler Robert Ebendorf uses such a labor-intensive technique that he can only produce a single bead each day (Dubin 1987:320). Beads have been made with biological material (bone, teeth, shells), geological materials (stones, gems, fossils), and artificial materials (glass, faience, plastic, etc.). Often times, the same bead shape will be made with multiple different materials. After shaping a variety of different raw materials into a variety of different shapes, many beads received additional decorations including glazing, etching, painting, and inscription.

II. C. 2 Methods of Analysis

Recognizing the complexities involved in understanding beads and their assemblages, many conventional archaeological techniques are used in analyzing beads. Though determining typologies for beads is a bit more complicated than it might be for other archaeological finds, they can and do provide valuable insight and are an excellent starting place for bead analysis. One can type beads by any of many factors depending on what information one seeks. One of the most widely accepted bead typology guides, and the one used in this analysis, is the *Classification and Nomenclature of Beads and Pendants* by Horace C. Beck (1973 [1928]) (Dubin 342). Beck bases his very thorough typology guidelines on the claim that "To describe a bead fully it is necessary to state its form, perforation, colour, material, and decoration" (Beck 1973:1[1928]).

Additionally, experimental archaeology can be used to evaluate a variety of bead characteristics. Gorelick and Gwinnet used a series of archaeological experiments to determine the causes of various abnormalities in the perforations of several beads (1991). Vanzetti and

Vidale combined typology and experimentation to devise the process of bead manufacture for the Mehrgarh steatite discs (1994:772). Roux and Pelegrin (1990) used ethnographic experimentation to determine relative quality and technicality of products in the modern bead industry in Khambat, India, interpretations of which have broad reaching archaeological implications. Most recently, Kenoyer (2005) reproduced a pot-firing sequence to confirm his interpretation of the Indus faience production system.

The specific laboratory techniques utilized in bead analysis vary throughout the literature from naked eye observation to scanning electron microscopic (SEM) examination (Mayer et al. 2004:496). Insoll and others used a UV-LA-ICP-MS, "ultraviolet-laser ablation inductively coupled plasma mass spectrometry," technique to chemically compare carnelian samples from Africa against those from India and determine a source (2004:1166).

Nevertheless, this sourcing of material is an excellent example of how, even with the most high-tech procedures, advanced interpretation of the archaeological bead record requires a multi-layered approach. Unlike ceramics, the source of a bead's material is frequently not the place of its manufacture. In fact, there may be many steps and stages of trade and movement in a beads life between raw material extraction and finished product utilization. For example, from 2600 to 2400 B.C., there was a lapis lazuli trade route stretching from Badakhshan, Afghanistan, where the raw stone was mined, to Shahr-i Sokhta, Iran, where pure lapis was separated from waste and prepared for transport, and finally to Sumer, Iraq, where the precious products was manufactured and consumed (Dubin 1987:30). With lapis lazuli waste at Shahr-i Sokhta, it could easily be misinterpreted as a manufacture center, and sourcing the raw material to Afghanistan could easily obscure the important Iranian participation in the trade. Certainly, as economic interactions between civilizations in the old world increases, so does the complexity of interpreting the material culture they left behind.

II. C. 3. Potential Significance

Beads are capable of providing many unique insights into the cultures and civilizations which produced, traded and consumed them. For example, despite long periods of consistency in their evolution, beads can be useful for identifying relative and absolute dates. Not only can some beads be isolated to specific periods (Niharika 1993: vii), but the spread of bead styles across space can also be utilized to establish changes in time. Spreading beyond the boundaries of a single culture, beads have long possessed the potential to connect disparate cultures in economic and cultural exchange. As seen above, both beads themselves and the raw materials used to produce them have been exported from one culture to another, at times casually, on an occasional scale, and at other times, as part of a massive, well organized industry. In less tangible terms, bead technologies and, on occasion, the manufacturers themselves were imported and exported on a regional scale.

By tracking the changes in bead technologies of a particular culture over time, one is able to see changes in the overall technological capacity and thereby infer changing levels of social, political, and economic organization of that culture. Kenoyer observed that the "shapes of the Indus agate beads are more standardized than those of the Neolithic" (1986:20). This observation supports what would make reasonable sense, that "the technical sophistication of bead manufacturing often mirrors the general technological level of the society" (Durbin 1987:18).

A distinct part of any civilization's material culture, beads can also communicate specific cultural traits to the careful observer. For example, the burial of certain bead types and assemblages rather than others in the Indus may signify that these beads functioned not as displays of wealth or social status, as they did in Ur, but rather were part of specific burial rituals or perhaps were "highly personalized and could not be transferred to living relatives" (Kenoyer 1991:95). In a ritual role, ornamentation styles can reveal facets of belief and value systems (Kenoyer 1991:94); in an artistic role, the evolution of beads "is a clear expression of the evolved aesthetic sense of the (*sic*) humanity through successive millennia" (Niharika 1993:vii).

Certainly, a thorough understanding of the Umm an-Nar beads, though a difficult task, is a worthwhile pursuit.

III. Procedure (Methodology)

Having never conducted field research before, the process of developing a procedure for examining the RJ-1 and RJ-2 beads was as much a learning process as analysis of the data. From the start, the objective was to survey the beads from Ras al-Jinz 1 and 2 and determine whether there were typological or industrial associations with the beads of foreign civilizations. The first step was to define the investigation's parameters within the projects limitations.

With over 11,000 beads it was impractical to expect to be able to examine each artifact individually in the time available. Steatite, chlorite, and shell beads had previously been documented as part of the local bead industry, being found in Oman as early as the late 4^{th} millennium, prior to external contact. Fortunately, the bulk of the RJ-1 and RJ-2 collections was composed of these local materials. Excluding these beads because they were outside the scope of the inquiry and focusing on the more likely imported materials: faience, carnelian and heated steatite, reduced the number of beads to be examined to a much more manageable amount. The final number, 1,223, was a combination of these materials and other exceptional beads which did not fit into the general Omani typology.

Limitations of the available tools also had a significant impact on procedure design. The incapacity for chemical analysis or experimental reproductions limited the depth of investigation to surface level survey, an appropriate level of investigation for the first examination of a collection. The highest magnification available on site was a low-power magnifying glass. Measurements were taken with a set of steel, metric vernier calipers: measured to the nearest millimeter and estimated to the nearest tenth of a millimeter.

With parameters defined, data collection was achieved in a four part process. Having he beads had been grouped according to proximity to one another and stratigraphic unit, then assigned "DA" numbers before being inventoried and stored at the Ministry of Heritage and Culture in Muscat, Oman. The first step was to sort the beads of each DA according to material and form, and each sub-category was assigned a letter. Then, a sample bead from each letter was described, measured, and photographed. For each category, measurements and descriptive data, along with personal notes, were entered into a database along the beads' quantities, DA numbers, sites, years of excavation, and stratigraphic units. Descriptive notes included the bead's shape, color, hardness, perforation shape, and any other distinguishing characteristics. Measurements were taken of the diameter and length. When necessary, measurements of a second diameter or width were also recorded. The smallest diameter of the perforation was also measured. Perforation diameters unable to be measured by the calipers were measured by a series of rod-tests. Rods of different known diameters were passed through the perforation to determine the largest passable rod. Rods included a paper-clip wire (diameter 1mm) and various grades of mechanical-pencil lead. Once measured, each bead category (each letter from part one) was photographed at multiple angles by a Panasonic Lumix DMC-LZ2. Each frame included a four-colored standardizing scale.

IV. Results

Having determined which beads to examine and how to examine them, the effort to determine whether there are typological or technological associations between the Omani collection and external communities is efficiently and successfully accomplished. The 1,223 carnelian, heated steatite, faience and exceptional raw steatite beads studied proved quite fertile ground for the discovery of foreign goods and influence. Some of the most telling characteristics were identifiable manufacture processes and errors. Though the collection as a whole is of a rather poor quality, relationships emerged both within the collection and between this collection and others.

IV. A Carnelian

IV.A.1 Background

Carnelian is a term applied to a subset of the agate/chalcedony group of stones. A microcrystalline quartz with red to orange hue, it can be naturally occurring (Whitehouse 1975: 130) but is often the product of very precise heating procedures (Insoll et al. 2004: 1164). Not only is it an attractive stone, it is easily worked and it has been commonly used in the manufacture of beads in ancient and modern times. Though it has a hardness of 7 (Beck 1973:53 [1928]), it fractures conchoidally and is, therefore, easily knapped (Chevalier et al. 1982:56). At one time it was considered a typically Indus material, but now extraction and manufacture sites have been identified across the old world (Whitehouse 1975:129). It is true that Gujarat, especially in the district of Broach, had (and still has) an abundant supply, but sources have been identified in the Helmand basin in Siestan as well as on the Bushehr Peninsula of Arabia (Whitehouse 1975:129). Naturally occurring carnelian has been noted as near to Oman as Yemen (Inizan et al. 1992:163-164).

IV.A.2 General Assemblage

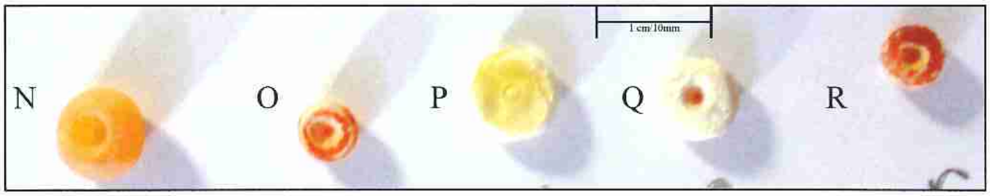

Figure 14: (DA 15552 n-r) These five carnelian beads display the wide color variation in the Ras al-Jinz bead collections, from shades of translucent orange and red to opaque white. You can also see hear two examples (o and r) of overheated beads with white coating.

Though the collection of carnelian beads at Ras al-Jinz was not standardized, the vast majority of the specimens fall into one of several basic forms. Of the 258 beads examined, 219 (84.88%) have lengths between 1/3 and 9/10 their diameter, falling into Beck's "short" classification, and 229 (88.76%) fall into the broad shape categories: barrel (91), bicone (87) or truncated bicone (51). Every carnelian bead in the collection has a single perforation, and, while the perforations of only 219 of the beads were examined, there was remarkable constancy in this set. 97.72% (214/219) have perforations of types I or II, double cones (or hourglass shaped) [Figures 14 n, o, q, and r] or drilled from both directions [Figures 14 p and Figure 15]. Color ranges from opaque white with orange patterns to translucent red and yellow [Figure 14].

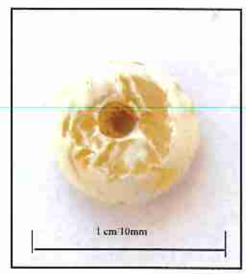

Figure 15: (DA16354-a) A carnelian bead perforated with bi-directional drilling

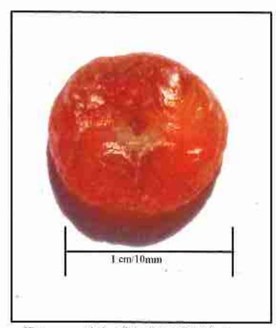

Figure 16: (DA11928) A carnelian barrel disc with a highly chipped and unpolished exterior

The overall quality of the collection was rather poor with the majority of beads being rough, unpolished [Figure 16] and multiple beads displaying decidedly off-center perforations [Figure 17]. A third deformity that was prevalent in the carnelian collection was discoloration due to improper heating. Under-heating led to irregular or incomplete transformation from the raw agate. For example, some beads had clarified cores with opaque exteriors [Figure 18]. Another subset display burn marks [Figure 19] from uneven heating. However, discoloration from over-heating, was by far the most common effect: the relatively consistent presence of a semi-translucent white coating on the exterior surfaces of an otherwise clarified and beautiful carnelian bead [Figure 20].

While the majority of the carnelian is etiologically unidentifiable, several recurring abnormalities provide useful information regarding the manufacture techniques, and thereby the sources, of some of these beads.

Figure 17: (DA12871) A carnelian barrel disc with an off-center chipped hourglass perforation

Figure 19: (DA15515) A short carnelian barrel that that was heated unevenly and burnt on one side

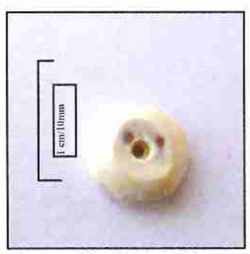

Figure 18: (DA16427-g) This bead appears to be under-heated, with a transparent center but an unclarified exterior remaining

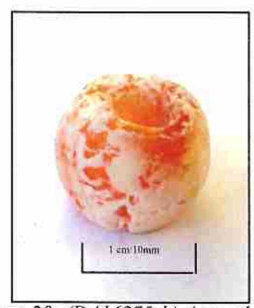

Figure 20: (DA16275-b) A standard carnelian barrel over-heated with a calcified white coat

IV.A.3 Cylinder-cone perforation

A scarce, but significant, type of bead is identifiable by an unusual perforation. 25 beads display a drilled cylinder from one surface which terminates in a lip. The perforations on these beads are completed by a crater, usually irregular in shape, indenting from the opposite surface [Figures 21]. By no means a ubiquitous style, these beads comprise only 13.89% of the entire assemblage (25 of the 180 carnelian beads whose perforations were measured and described). All of these beads are 3.1mm or less in height and are classified as short or disc, bicones or barrels, and this entire set was found in various chambers of Tomb 1 at RJ-1. There are no real patterns in color with many shades from yellowish green to deep orange. It is possible that this deformation was the result of clumsy drilling where the back popped off the bead when drilled too deeply. However, there is precedence for this effect being the intentional result of a reliable manufacture system in Mesopotamia (Chevalier et al. 1982) [Figure 22]. Of these two competing possibilities, the frequency of this feature implies that it was not an error.

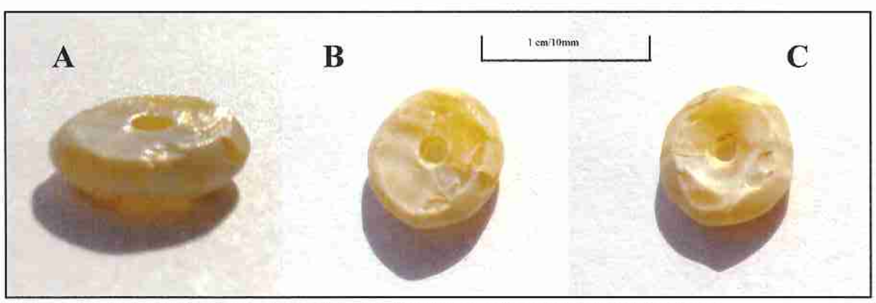

Figure 21: (DA12415) Three shots of a carnelian bicone disc which may have been manufactured using the Mesopotamian drill percussion technique. A and B show the top side, clearly drilled. C shows the percussion crater on the bottom side.

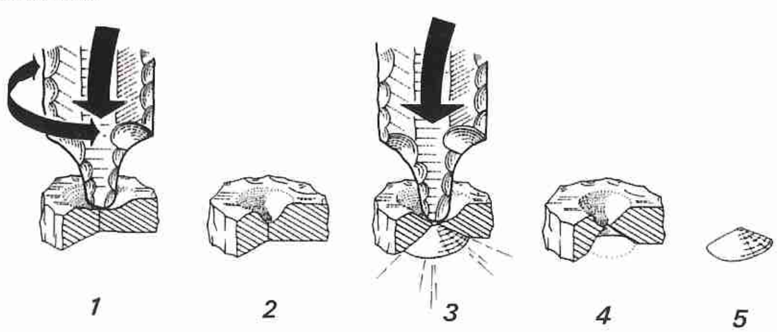

Figure 22: The extrapolated manufacture process for carnelian beads at a 3rd Millennium BC Mesopotamian site (Larsa, Iraq) (Image from Chevalier et al. 1982)

IV.A.4 Fragmented Long Bicones

The other potentially external carnelian type are three fragments of what may have been long bicones (16372-a, 8353, and 10121) [Figures 23, 41, and 42]. Unfortunately all of these pieces are only small fragments of their originals. Each a different size cylinder whose sides are not exactly parallel, reasonable interpolation could results in a lengthy bicone. While these artifacts cannot be conclusively identified with an external culture, these three specimens do seem to distinguish themselves from the rest of the carnelian assemblage in that they are all very accurately rounded and polished.

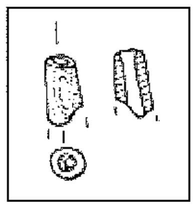

Figure 23: (DA8353) This drawing displays the convergence of the outer edges of this and similar beads, suggesting a long biconical form for the original, unfragmented bead. For photographs see Figures 24 and 25.

IV. B Steatite

IV.B.1 Background information

Steatite has been an important and popular material in the bead making industry from the beginning of stone beads. Registering on the Mohs scale at 1-1.5, it is one of the softest stones known. It is easily identified by a soapy feel because of its primary component, talc. Naturally occurring material in Egypt, the Indus Valley, Mesopotamia, Syria, Turkey, and throughout the Arabian Peninsula, it can appear black, white, or various shades of grey, green, or red. As noted above, there had been a long tradition of green and black steatite beads in Oman before the Umm an-Nar period. From the two sites studied, many thousands of steatite and chlorite microbeads were recovered. For this reason, raw steatite beads were not studied extensively in this project. However, two individual beads of unusual forms were included as possible contact indicators, with mixed results.

IV.B.2 Square Spacer

This square tabular bead with double angle perforations (DA16277-b) was found in the fourth chamber of the RJ-1 tomb in 2003 [Figure 24]. Made of black steatite, it has two perforations which run parallel, each cutting from one side of the square to the side directly adjacent. It measures 5.5mm in length (the diagonal of the longitudinal section) and 3mm in diameter (the height of the transverse section). The perforations are plain cylinders, measuring .8mm in diameter. The double perforation indicates DA16277-b is a spacer-bead, designed for multi-strand ornamental wear. As will be discussed later, this bead stylistically matches an Iranian series.

Figure 24: (DA16277-b) This rectangular steatite spacer has two diagonal perforations, in a style similar to Iranian beads found elsewhere in Oman

Figure 25: (DA8562) This irregularly shaped steatite bead is one of a kind, its only potential parallel lies in the nut beads of the Indus

IV.B.3 Seed bead

The second steatite bead of stylistic interest from these collections was an irregularly shaped black steatite bead (DA8562) [Figure 27]. With radiating marks from both ends, it appears very much like a seed. 14.6mm in length and 11.4mm in diameter, the seed bead was recovered near the southern compound of RJ-2. The perforation is unremarkable: a plain cylinder measuring 2.5mm in diameter. As of yet, inconclusive, there are potential associations between this bead and the perforated areca-nut bead tradition in India (Francis 1981) or the lotus seed bead of Mesopotamia and Egypt (Eisen 1930).

IV. C Heated Steatite (Paste beads)

IV. C.1 Background Information

Figure 26: (DA15553) A selection of a group of 77 small heated steatite cylinder discs

The first artificial materials used for bead production were transformations of the already popular substance, steatite. When heated to 850° Centigrade, talcose steatite releases its water of crystallization and forms a mixture of cristobalite, enstatite and alumina (Hegde 1983:70). The advantage of this process is a hardening of the mineral from 1.5 to 6 or 7 on the Mohs scale. Experimental data indicates that at least a significant portion of the time, the steatite was ground down, combined with a flux (to aid its fusion), and prepared as a paste before heating (Mayer et al. 2004: 496, Hegde et al. 1982: 242). Bead hoards at Chanudaro and Zekhada have illustrated a system of extrusion of this steatite paste for the production of microbeads (Hegde et al. 1982:242). The white, opaque products of this process have been referred to as "white steatite," "burnt steatite," "reformed steatite," "heated steatite," "enstatite," and "paste" (Vidale 1989:292, Mayer 2004:496, Niharika 1993:17-21). Various texts have each made their own distinctions between these forms, but none of these definitions have been applied consistently enough to gain authority. In this paper, all these products are grouped under the titles "heated steatite" or "paste" bead.

IV. C.2 Assemblage

There were 442 heated steatite beads recovered from RJ-1 and RJ-2. Their highly consistent shape, size, and color suggest production using the same extruded paste manufacture system identified at Chanudaro and Zekhada. For example, the Indus production process produced long paste cylinders which were further divided into smaller cylinder discs and microbeads. In the Ras al-Jinz collections, over 90% of the heated steatite beads (405/442) are cylindrical in shape. Several of the outlier shapes have rhomboidal longitudinal sections (15424-c, 15519, 15509-b) [Figure 27], very much like distorted cylinders. This deformation indicates the raw material was a soft, malleable paste rather than chipped or ground stone. Additional deformations which expose manufacture processes are the striations present both laterally, on the ends, and longitudinally, on the exterior surfaces, of a significant number of the beads [Figure 28]. It was similar striations on Indus beads which resulted in the identification of the extrusion manufacture system: the longitudinal striations being produced by irregularities in the copper mold perforations through which the paste was pressed, and the lateral striations being caused by the slicing of the longer cylinders as they emerged.

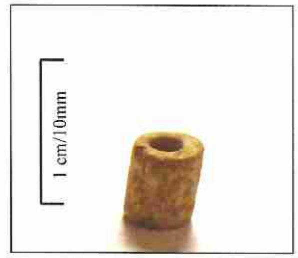

Figure 27: (DA15519) A heated steatite cylinder which appears to have been deformed during production, causing a rhomboidal cross-section

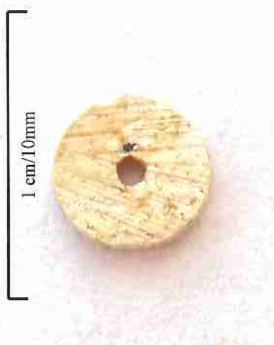

Figure 28: (DA16354b) A paste disc with well delineated striations on the surface. Identical to Indus saw marks, these lines aided in the identification of these beads.

Furthermore, the size standardization within the RJ-1 and RJ-2 heated steatite collection, especially in bead diameters, is indicative of mechanical production processes, like those of the Indus paste extrusion system [Figure 29]. Qualitatively, examination reveals an incredible degree of accuracy in producing

Figure 29: (DA16356g) A group of 18 paste discs with diameters of 3.1 which, demonstrating the diameter consistency of the paste cylinders.

perfectly round cylinders. Quantitatively, 75.06% (298/397) of the cylindrical beads examined (excluding bead fragments, and other un-measurable beads) have diameters of 2.1mm (62), 2.6mm (117), 3.1mm (91), or 5.0mm (28) (±0.1mm). Perhaps the most striking consistency lies in a type of paste disc for which 28 beads were independently recovered (from separate locations) and independently measured all of which had the identical dimensions of 5.0mm in diameter and 1.0mm in height [Figures 28 and 30]. While standardization in diameter can be attributed to the technological features of production, the standardization in height reveals the highly organized and skilled labor of the bead industry which produced this series.

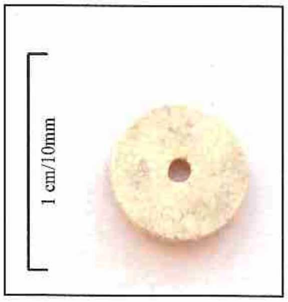

Figure 30: (DA16348) One of 28 round heated steatite discs with the dimensions 5x1mm

Finally, like the Chanudaro and Zekhada beads, almost all of these beads were purified to a clean, bright white, presumably by baking the steatite paste at high temperatures. Only 3.8% (17/442) were tinged aqua, yellow, or shades of light grey.

IV. D Faience

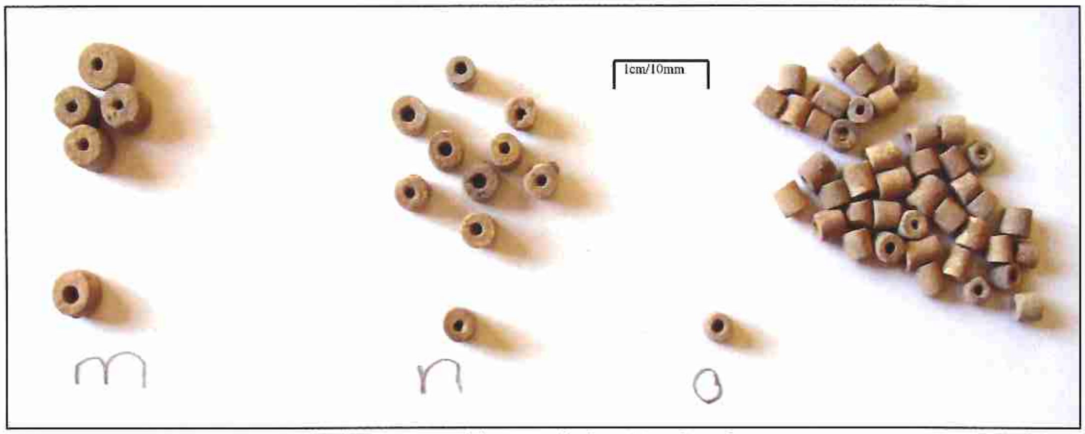

Figure 31: (DA16404m, n, and o) Various sized faience cylinders. Note the color variation.

IV.D.1 Background Information

Faience is a synthetic material made from steatite or quartz paste (Mayer 2004: 499, and Niharika 16) mixed with a flux of plant ash which is fired for 4 or more hours at temperatures in excess of 900°C (Kenoyer 2005). In the production of faience, like heated steatite, the heat that is applied to the raw materials drastically increases its hardness. But rather than dehydrating the mineral, the heat of faience production melts the exterior of the grains, binding individual particles together. This is why faience is often considered the forerunner to glass (Dubin 1987:43).

Faience beads come in an incredible variety because, made from a paste, faience can be molded into almost any desired shape. It can also be made into a variety of colors, including blue, green, yellow, black, white, chocolate, and red, by adding various coloring agents. The color can be either mixed in with the paste, or it can be applied after drying and before firing, leaving color only on the exterior surfaces of the bead (Niharika 1993: 16). With such variability, this material was often used to manufacture cheaper imitation of precious stones like lapis lazuli and turquoise (Dubin 1987:43).

IV.D.2 General Assemblage

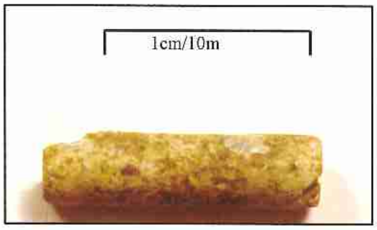

Figure 32: (DA14610) An example of a long faience cylinder

Within the collection of 474 faience beads from RJ-1 and RJ-2, one can observe both uniformity and variety. The dimensions of the beads are evenly distributed among short (182), standard (177) and long (113) classifications. (There is one disc bead and one bead whose measurements are excluded.) Typologically, cylinders make up the largest proportion with 392 specimens (82.70%). However, barrels (43) [Figure 33] and bicones (29) are both sizable and cohesive subgroups. In addition to these shapes, there are other miscellaneous spherical, biconvex, and irregularly shaped beads. The beads' colors, which include many shades of green, grey, yellow, and even red and brown, may be the most diverse aspect of this collection. [Figures 31 and 34]

Figure 33: (DA12849) A collection of faience barrels showing light green and yellow frit coloring

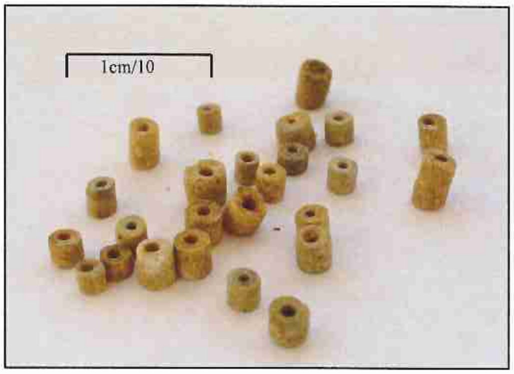

Figure 34: (DA16370) Faience cylinders of a variety of colors

IV.D.3 Bicone Microbeads

While the majority of the faience collection is made up of inconsequential cylinders, the biconical microbead subgroup offers several unique insights into local faience production mechanisms. This classification refers to a set of 20 beads which display various shades of grey to white. Ranging from 2.5 to 2.8mm in diameter and 1.5 to 2.7mm in height, this group is distinguishable by its miniature size. Fairly consistently (specifically noted on 14 of the 20 specimens), these beads are marked with longitudinal striations radiating from the ends [Figure 36]. Since vertical striations are a feature of other, larger faience bicones (16379) [Figure 35], perhaps this is an effect of the local manufacture processes. Reminiscent of brush strokes, these striations could be the patterns of brushed on frit or glaze.

Figure 35: (DA16379) A long faience bicone displaying similar brush marks as the bicone microbeads

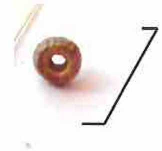
Figure 36: (DA15341) Faience bicone microbead displaying small striations radiating from the ends. Possible frit brush - strokes

This set of micro-bicones also displays several deformations which put into question the competence and enthusiasm of the manufacturers. One bead has a double perforation (16290) [Figure 37]. Like it did in the heated steatite, this inaccuracy clearly occurred before firing, while the bead was still soft. It is curious that rather than fixing the error, the laborer simply proceeded to fire the blemished bead. Also, under close inspection (with the low power magnifying glass) horizontal (or lateral) lines are also visible. However, these lines do not exhibit the regularity of intent; they are heat cracks, irregularly criss-crossing the beads' surfaces. Such malformations would have been highly uncharacteristic for well-organized and trained foreign bead makers.

Figure 37: (DA16290) Faience bicone microbead displaying double-punch perforation error. Also notice the radial striations from end like Figure 38.

IV.D.4 Melon Bead

Perhaps the most significant faience bead in the entire collection is a large spherical melon bead recovered near the southern compound of RJ-2 [Figures 38, 39 and 45]. Light green in color, it has 12 twelve longitudinal depressions, or flutes, adorning its exterior. 11.5mm in length and diameter with clean edges and perfect symmetry, this bead a gives an impression of high quality and precision. The perfection of this bead sharply contrasts the flawed character of the faience microbicones examined above.

Figure 38: (DA9980) Green Faience melon bead

Figure 39: (DA9980) Green Faience Melon bead

V Discussion

There is tremendous diversity within the collection of more than 11,000 beads of Ras al-Jinz. Yet within that diversity, there are patterns to be found: patterns of intercultural contact and patterns of economic and cultural exchange. Quality, style, and manufacture technique are all important factors in deciphering the beads to define and interpret foreign contact at Ras al-Jinz. In the end, the beads of RJ-1 and RJ-2 reinforce previous knowledge of regional interaction and broaden the understanding of cultural and economic exchange in EBA Oman.

Figure 40: The civilizations of the Early Bronze Age involved in the Middle Asian Interation Sphere (Image from Possehl 1996)

V.A Intercultural contact

The third millennium BC was an era of unprecedented travel and commerce among the flowering civilizations from Africa to Asia. People, goods, and ideas were being shipped and traded in increasingly regular patterns and relationships. The Middle Asian Interaction Sphere, stretching from Mesopotamia to the Indus, was an especially active part of these evolving trade networks. [Figure 40] Ceramic finds and various other materials have long been know to associate Eastern Arabia, Ras al-Jinz in particular, with this regional traffic. Connections with Mesopotamia, Iran, and the Indus within the bead assemblage at RJ-1 and RJ-2, from the second half of the 3rd millennium BC, confirm both longstanding and newly developing foreign contacts.

V.A.1 The Indus

Of all the Early Bronze Age civilizations, the Indus Civilization has the best documented and most thoroughly understood bead manufacturing industry. Ornamental wear being prominent within the Indus culture and a significant export to various other cultures, bead manufacture and exchange systems were exceedingly well developed in 3rd millennium BC India and Pakistan. Specializing in etched and long barrel carnelian beads, their bead manufacturing technologies far surpassed those of their western contemporaries, and many of their bead types are easily and exclusively identifiable. With such a prominent component of Early Bronze Age bead history previously identified as a maritime contact of the Ras al-Jinz community, the Indus was an obvious place to start when seeking external influences on the RJ-1 and RJ-2 bead assemblages.

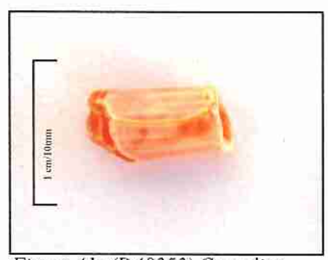

Figure 41: (DA8353) Carnelian fragment, possible long bicone

This being said, the representation of directly identifiable Indus bead types within the Ras al-Jinz collection is rather unexpected. The famed Indus carnelian is virtually absent from this Omani record. Only three small and fragmentary pieces (DA16372-a, DA8353, and DA10121) may have been parts of longer carnelian bicones. [Figures 41 and 42] As discussed above, these three are distinguishable from the Oman tradition in

Figure 42: (DA10121) Carnelian bead fragment, possible long bicone

their flawlessly smooth exterior and perfectly circular cross-sections. This leads me to believe they are imported product, but there is no conclusive evidence which places them within the Indus tradition.

Rather, it is the heated steatite, or paste, beads which illustrate a decisive link between Oman and the Indus. Described by Vidale as "ubiquitous across the surface and the excavated contexts of Harappan sites" (1989:293), paste beads have been recorded extensively at Harappa (Beck 1974: 392) and Chanu-daro (Mackay 1937: 12; 1976: 205), but their roots in the Indus reach back to the Early Harappan site of Mehrgarh-Nausharo (Vidale 1989: 291) [Figure 43]. In various site reports and inventories 'white steatite,' 'burnt steatite,' 'reformed steatite' and 'paste' (Vidale 1989: 292) have all been used to identify the unglazed, off-white, opaque, heated talcose substance which forms these thin discs.

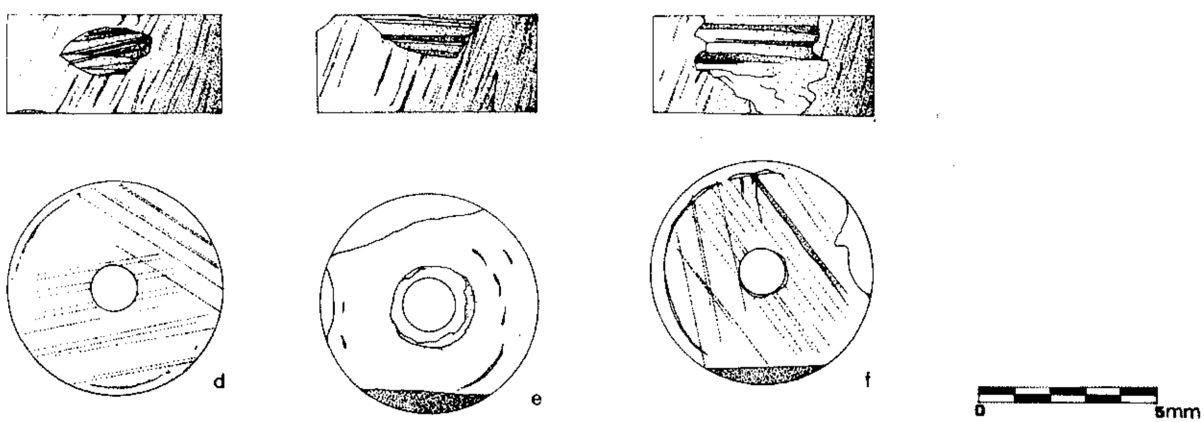

Figure 43: Paste discs from Nusharo-Merhgarh showing the saw marks, identical to the saw marks on the surface of the heated steatite discs from Ras al-Jinz (Image from Vidal 1989)

The first indicator that the white discs, recovered primarily from RJ-1, were an external import was their remarkable uniformity in size, shape, and design. Compared with the variation in bead size of the larger bead assemblage, the size of these beads and their perforations were remarkably consistent. This consistency reflects the size standardization of the Mehrgarh paste beads noted by Vidale (1989: 297). The stylistic associations extend also to the accuracy with which both the Indus and the Omani beads were produced. Like the Indus beads (Vidale 1989: 297) and unlike associated Omani beads, most of the RJ-1 disc paste-beads are perfectly circular with sharp edges and well-centered perforations.

Additionally, the heated steatite discs from Ras al-Jinz are consistent with the Indus tradition in material and manufacture style. The two traditions display the same multi-directional saw marks on their broad flat tops. [Figures 43 and 28] Vidale believes these to have been made by the transverse cutting of cylinder blanks and the adjustment of the position of the saw in the midst of cutting (1989:296). Finally, the production of the parent cylinder by a process of extrusion manifests itself in several ways in Indus beads: concentric rings on the flat surfaces of the beads and well-grouped diameters. The first indicator, concentric rings, was not observed on the Omani paste bead collection, but the diameters of the Ras al-Jinz beads were, indeed, well grouped. In the Mehrgarh assemblage, all of the straight cylindrical perforations fall into two sizes (1.3 and 1.5mm) (Vidale 1989: 297). In the Ras al-Jinz assemblage, all of the perforations are straight cylinders which are highly concentrated around 0.8mm.

V.A.2 Mesopotamia

Though the archaeological literature regarding bead styles and manufacture in Mesopotamia is much sparser than that documenting the Indus bead industry, there are two substantial linkages between what has been uncovered in Oman and what is known of Mesopotamia.

The first clear connection between the Ras al-Jinz bead collections and the Mesopotamian tradition springs from the series of carnelian discs whose perforation terminates in a percussion crater [Figure 21]. The explanation for this particular morphological trait was uncovered at th 6th millenium BC site of Kumartepe, where a carnelian workshop containing beads at various stages of manufacture was studied (Moorey 1999:108). In his analysis of the manufacture system used, Grace reports that "Drilling would . . . be used to perforate approximately halfway through the blank. The completion of the perforation seems to have been achieved by the removal of a conical flake . . . a drill-bit is placed in the hole and struck, producing a conical fracture scar" (1989-90:149). Chevalier and others described an identical technique being used at Larsa, Iraq, in the 3rd millennium BC (Moorey 1999:108) [Figure 44], at the same time boats are making regular trips to and from Eastern Arabia.

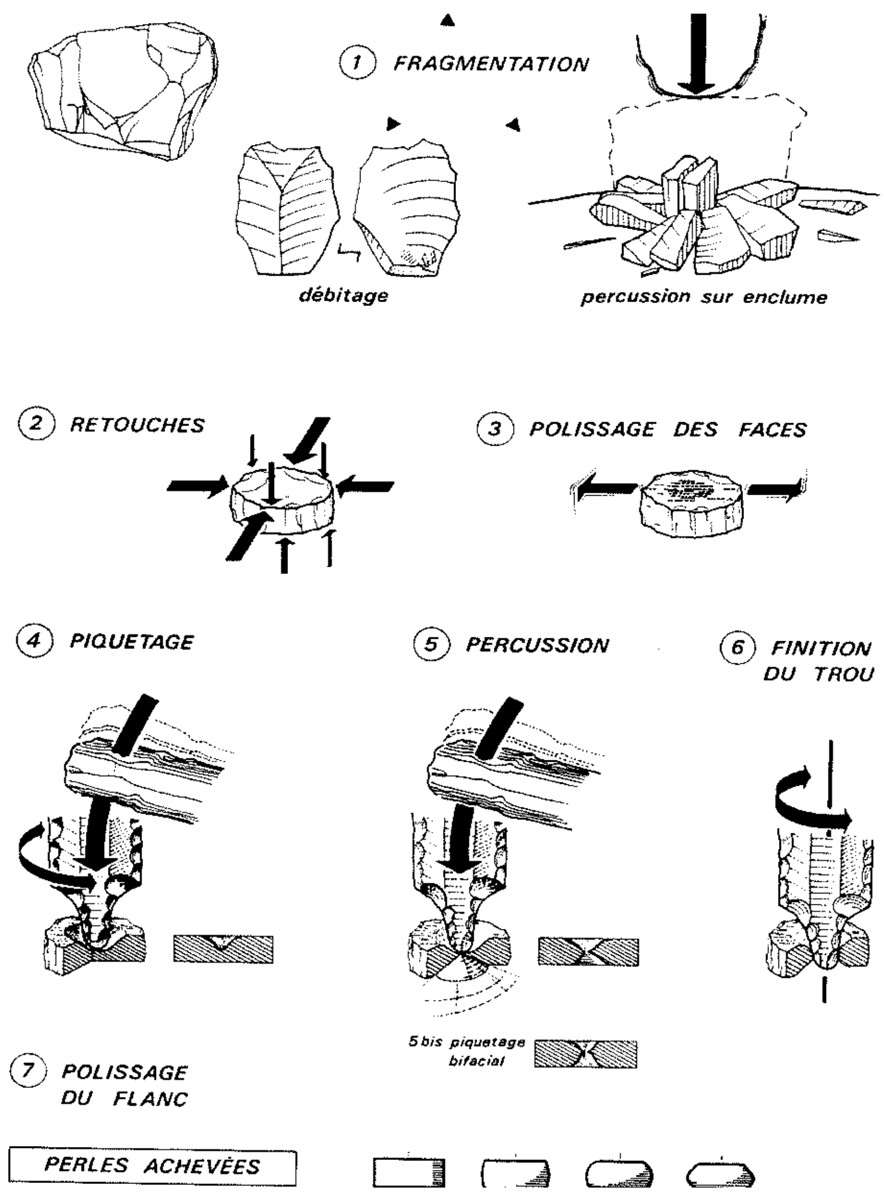

Figure 44: The percussion perforation system identified in use at Larsa in the 3rd millennim BC. Beads with a similar perforation pattern were recovered at Ras al-Jinz.

A second import from Mesopotamia was the lone melon bead found at RJ-2 (DA9980) [Figures 38, 39 and 45]. In the Mesopotamian record, the melon shape is well represented. A necklace with eight ribbed lapis lazuli beads was discovered in the Treasure Jar of Court XVII of the Pre-Sargonic Palace at Tell Hariri in Mari (De Backer 2005: 21[catalog]). Golden ribbed beads are elements in a bracelet found in the same treasure jar (De Backer 2005: 26). Made from a variety of materials in many of the far-reaching regions of the Mesopotamian Empire, this bead shape can be culturally identified with the Mesopotamian people. Beyond merely matching a common Mesopotamian shape, the RJ-2 melon bead was made from a material and color also common in the Mesopotamian record. At Tell Brak, frit and faience are the most popular materials used for the melon beads, and several faience melon beads were glazed green (Oates et al. 2001) [Figure 46]. One can safely associate this bead with the Mesopotamian sequence given their substantial records that reflect the RJ-2 green faience melon bead's shape, material and color.

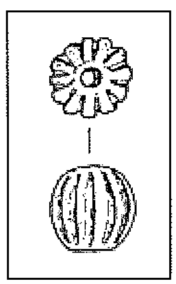

Figure 45: (DA9980) Drawing of faience melon bead from RJ-2, compare with Mesopotamian melon beads from Tel Brak below.

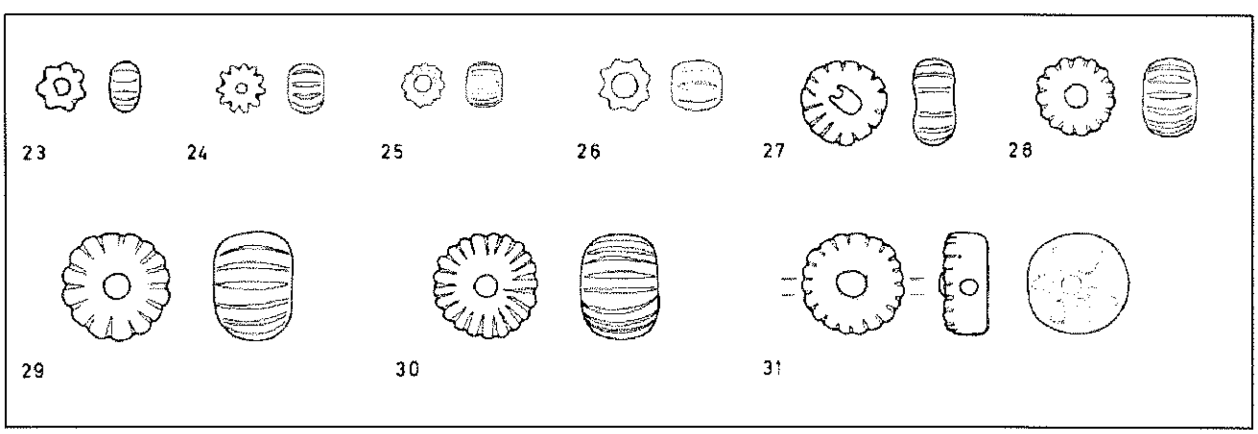

Figure 46: Mesopotamian melon beads from Tel Brak, all made from artificial materials like DA9980 of RJ-2 (above) (Image from Oates et al. 2001)

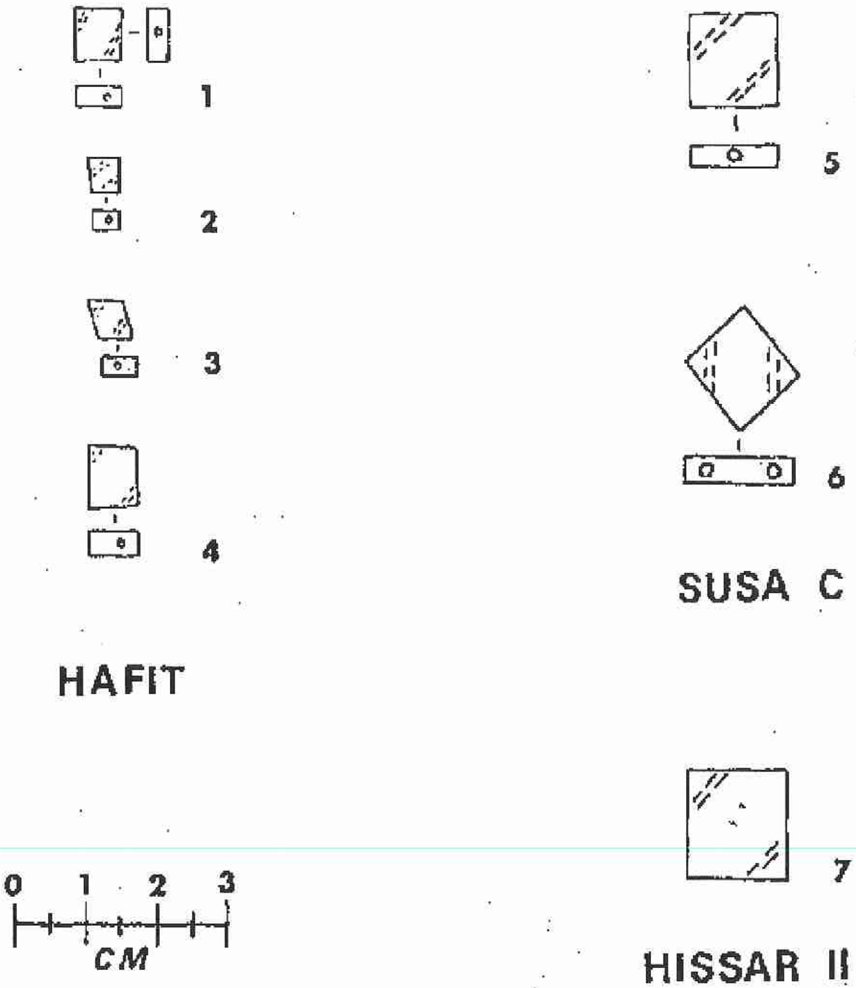

Figure 47: Square spacer beads from Hafit and Iranian contexts, all made from artificial materials (Image from Cleuziou and Tosi 1989) Compare with steatite square spacer bead below [Figure 45]

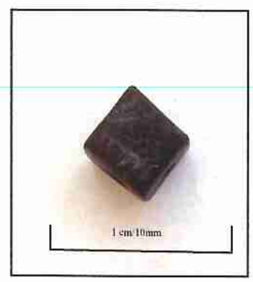

Figure 48: (DA16277) Steatite square spacer bead from Ras al-Jinz which is a stylistic match to earlier Hafit and Iranian beads [Figure 44]

V.A.3 Iran

Iran is the area presently suspected to have had the earliest contact with Eastern Arabia, a circumstance which is reflected in the Ras al-Jinz bead representation of Iranian ornamentation. Uniting external Iranian styles with local materials, the small square spacer found in chamber 4 of the RJ-1 tomb (DA16277) is the pinnacle of assimilation of foreign goods [Figure 48]. A square tabular bead with double angular perforations, it is a stylistic match to a series of beads found in Iran during a period spanning from Jemdet Nasr to EDII across an area from Susa to Tepe Hissar (IIB) (Cleuziou and Tosi 1989: 30) [Figure 47]. This Iranian type was imported to Eastern Arabia early in its development with similar beads found in several Hafit cairns in the Jebel Hafit (Cleuziou and Tosi 1989: 27 fig.1). Identical to the Iranian tradition, all of these earlier Hafit-era spacers were fashioned from an artificial material (frit or heated steatite). However, the artifact recovered at Ras al-Jinz was made from steatite, the most common stone used in local bead production since the late 4^{th} millennium (Coppa et al. 1985:Plate 3). This bead is a notable example of foreign styles being incorporated into local culture, blending with local manufacturing material use to form an entirely new product.

V.B Interpretation

The influence of Mesopotamian, Elamite, and Harappan bead industries on the Ras al-Jinz collections is no surprise. Knowledge of contact between these Early Bronze Age civilizations and the Umm an-Nar has been well documented in the past, primarily through ceramic analysis and textual records. However, the addition of this ornamental layer to the record of the 3^{rd} millennium's intercultural contact does more than just solidify previously existing knowledge; it broadens our understanding of the economic and cultural exchanges and the overall influence of external relationships in developing EBA Oman.

V.B.1 Economic Exchange

Economic linkages of import and export, supply and demand, were engines that propelled ancient mariners, and the caravans before them, to contact other civilizations in distant lands. The interactions between Mesopotamia and the Indus were based on the trade of luxury goods (Possehl 2002: 218), and the copper market brought Mesopotamians to Oman at the turn of the

3rd century BC. Beads, as items with relatively high economic value, can supply useful information about economic relationships within a single culture or between separate cultures. Specifically, the poor quality of the relatively simple bead styles in the Ras al-Jinz collection leads to two separate, but equally viable, economic models (one internal and one external) for the developing cultural complex of which Ras al-Jinz was a part.

The overall quality of the RJ-1 and RJ-2 bead collection is exceptionally poor when compared with coeval assemblages. Many of the carnelian beads are unpolished, displaying the rough, chipped surfaces of a knapped product. The coloration of the beads is highly irregular; burnt patches and calcified coating mar the surface of a majority of the carnelian beads. A variety of mistakes are visible in the beads' perforations, the most difficult step in bead manufacture and the most critical to the beads' economic value. Many carnelian perforations are visibly off-center, and several faience beads display a double-punched perforation, indicating erroneous first attempts.

The poor quality is especially noteworthy when considering the low complexity of the bead assemblages. The carnelian beads of Ras al-Jinz avoid the most challenging types and knapping techniques identified by Roux and Pelegrin (1990:54). Relatively small bicones, they prefer 60° angles to 90° angles and short flakes to long. There are no cylindrical beads which rely on perfect balance nor are there any broad flat faces whose knapping is a matter of determining the best of many possible strategies. With the exception of one, undoubtedly imported bead, the beads of artificial materials, faience and paste, also avoid complex shapes or decoration.

Not only do these beads sharply contrast with individual high quality foreign beads found at Ras al-Jinz, they contrast with the bead records from excavations in Mesopotamia, the Indus and Iran. Certainly, quality standards for the Umm an-Nar were much lower than they were in Mesopotamian and Harappan markets.

However, the fact that these beads qualitatively distinguish themselves from external bead traditions does not necessarily exclude them from foreign origins. As simple, easily produced, shapes, bicones, barrels and cylinders can be found all across the EBA world in carnelian, faience, or heated steatite beads (Mackay 1976:Plates LXXXI-LXXXIII; Oates et al. 2001:Figure 473.32, Figure 474.60-68; Schmidt 1937:Plate XXXII). Similarly, knapped hourglass and plain drilled perforations are non-diagnostic. It is, therefore, equally likely that the RJ-1 and RJ-2 carnelian, faience and heated steatite beads were produced in foreign lands as in Oman, and both possibilities must be considered.

V.B.1.a External

Assuming that the low quality beads were produced externally generates an interpretation of regional and domestic economies where foreign production centers were systematically exporting their lowest-quality beads to Oman. The most logical of several possibilities, this scenario flows from several facts. As discussed above, the majority of the bead assemblage at Ras al-Jinz is comprised of low-quality, low-complexity beads, especially when compared to the high quality bead records of foreign civilizations. If these beads came to Oman individually through happenchance means: a sailor trading beads for fish, pirate raids on passing boats, a young boy finding a lost bead in the beach sands, or any number of other random ways for beads to travel, the record would most likely represent a random sampling of the external bead traditions. The range of qualities and styles of the Ras al-Jinz collection would be similar to those of the external traditions from which it came. On the other hand, the consistent paucity and simplicity in the record which distinguishes it from external industries implies it was not random, but organized, not occasional, but part of a large-scale well planned endeavor.

Accepting that Indus or Mesopotamian merchants consciously included low-quality local beads in their Oman-bound cargo, one can make further deductions about domestic and regional economies. For example, the relative price of the same beads in Omani and foreign markets can be inferred. In the Omani market, the price of these external beads in must have been, at least, the cost of production plus the cost of transportation. In the foreign markets, the value of these beads must have been less than their price in Omani markets for the merchants to have undertaken the export. The ensuing trade arrangement implies a level of sovereignty and empowerment for ancient Omanis. That they had assets, money, with which they could attract and compensate foreign exchange, confirms the recognition of their property rights, their ownership over the resources of their lands and communities. In other words, Mesopotamians were not stealing copper. Harappans were not poaching fish, and the Omanis were not victims of, but partners in, overseas trade.

V.B.1.b Internal

If, on the other hand, it is assumed that the substandard beads of Ras al-Jinz were produced locally, an entirely new set of economic conclusions should be drawn. A demonstrated proportionality of three inter-related traits: technicality in the bead products, training for the craftsmen and craft-specialization in the community, reveals the economic consequences of the paucity and simplicity of the RJ-1 and RJ-2 bead records. The resulting lack of specialization supports a description of the Umm an-Nar as occupationally mobile as well as geographically mobile. Nevertheless, this economic versatility does not necessarily interfere with their ability to participate in significant commercial relationships with more structured societies.

An ethnoarchaeological study of the modern bead making industry in Khambat, India, has direct relevance to the bead collections at Ras al-Jinz and provides the theoretical framework for this analysis. In "Knapping Technique and Craft Specialization" Roux and Pelegrin claim that "only certain socio-economic milieu enable long and difficult learning techniques to appear and to persist, at the cost of specialization by a sub-group" (1990:50). More specifically, they convincingly associate the degree of technicality in the production of various bead types to length and intensity of apprenticeship which, in turn, is proportional to the degree of craft specialization in the broader community.

Applying this relational model to the archaeological bead evidence at Ras al-Jinz ultimately reveals it to be a craft-generalized community. The co-occurrence of low-complexity and low-quality beads suggests that the relatively simple bead shapes are pushing the boundaries of the technical capabilities of the bead-makers in Oman to the point that the quality of beads produced decreases. In short, the Omani bead-makers are having a hard time making the simplest beads. The work of Roux and Pelegrin (1990) dictates that the Omani bead-makers must not have had the same length or rigorousness in training as the expert craftsmen of the Indus or Mesopotamia. Therefore, the RJ-1 and RJ-2 bead assemblage indicates craft-generalization, as opposed to specialization.

This economic inference supports the economic models of W. Lancaster and F. Lancaster (2002) and Cleuziou and Tosi (2000) which describe unspecialized, highly mobile populations inhabiting the Ja'alan in both the past and the present. W. Lancaster and F. Lancaster (2002) argue that without the concept of restricted access to resources modern *bedu* have been able to circumvent the traditional systems of specialization and stratification while fully participating in a cohesive community which engages external groups and has the capacity for trade. Cleuziou and Tosi transpose this fluid economic model to the EBA, proposing that Ras al-Jinz was inhabited by a migratory population which participated in multiple opportunistic cottage industries.

Certainly, the economic implications of the Ras al-Jinz bead assemblage contribute substantially to the understanding of commerce in the Early Bronze Age. The poor quality and low technicality beads of RJ-1 and RJ-2, if imports from abroad, reveal a new facet of Omani participation in broader regional trade networks. If local products, they suggest an unskilled, or rather, variously but shallowly skilled labor force. These two lines of thought and analysis are not mutually exclusive; it is likely that the reality of the Early Bronze Age in Eastern Arabia was a combination of these two conditions.

V.B.2 Cultural Exchange

More expansive than economic implications, the cultural significance of beads broadens the image of EBA regional interaction to include exchange in all aspects of human civilization. Beads have a distinct relationship with culture and its transmission because they are specifically designed to contain and transmit abstract, cultural concepts. Therefore, the study of beads can unveil such supremely human qualities as beauty, identity and belief, particularly as they were shared between communities. The exchange of these cultural concepts At Ras al-Jinz, funerary rituals,

With no innate utility, beads are socially defined by symbolic, artistic, or ritualistic features. A bead's value or meaning—commercial, social, political, spiritual, or otherwise—is an essentially arbitrary decision about its symbolic worth made by either the individual or the collective. In this way, beads carry and preserve such socially generated, and therefore communally characteristic, concepts as fashion, status, and faith. Thus, the exchange of beads between the Umm an-Nar and their neighbors carries particular significance, beyond that of identifying economic exchange relationships; it represents an exchange of ideas between two culturally distinct communities.

V.B.2.a Cultural Import-Implications for the Umm an-Nar

The flow of goods and ideas between separate communities is a gradual process. Various aspects of the bead assemblages of RJ-1 and RJ-2 reveal a progression in the integration of foreign objects and associated concepts. External commodities, both physical and intellectual, must first gain entrance into the community. Upon first acceptance, their exoticism is often a large part of their cultural significance, foreign origins a constant part of the items' identity which segregates it from domestic items. With the passing of time, assimilation increases; the dispersal and utilization of foreign beads more closely match those of their domestic counterparts. Finally, the external products are integrated to such an extent that demarcation between external and internal is blurred. The result is a new bead tradition which incorporates both internal and external sources.

Since beads are defined by abstract attributes, the presence of imported beads at the EBA site of Ras al-Jinz necessitates an adoption of new cultural concepts or modification of traditional ideas. The beads of another culture would have had no significance, no worth, to the Umm an-Nar unless there was an accompanying change in one or more of their abstract perspectives. They would have had to extend their definition of beauty, adopt a new mystical belief, or apply symbolic or social value to an item outside their established system before incorporating that item into their own culture. Consequently, the presence of a Mesopotamian melon bead and Harappan paste discs in the RJ-1 and RJ-2 collections signifies more than just contact with the outside world; it represents the acceptance of new and foreign ideas.

In seeking a more concrete description of how these beads impacted the culture of the Umm an-Nar people, burial rituals are some of the most observable of a culture's conceptual traits in archaeological remains. In previous studies, special cultural significance associated with burial has been transposed onto foreign ceramic finds as a means of interpreting the cultural significance of overseas contact. As Cleuziou states, "the deposit of Jamdat Nasr and ED Mesopotamian imported wares in cairn burials is considered as an indication of the importance which was granted by the forming EBA society of Oman to the connection with Mesopotamia" (my docs. pg.8). Cleuziou's referenced ceramic evidence exemplifies low-level integration, where external goods are accepted by Omani communities, but segregated from local material culture. The pursuit of similar manifestation of intercultural contact in burial contexts within the Ras al-Jinz bead collections reveals a higher level of cultural integration.

The entire bead collection at Ras al-Jinz presents strong case for a ritual function of beads in death. The fact that 11,260 beads were recovered from the tomb and bone pits of RJ-1 as compared to a measly 493 from all the buildings of RJ-2 (many of which were also from burial contexts) suggests a ritual function for beads in Umm an-Nar burials. This conjecture is further supported by the fact that a large percentage of the beads in RJ-1 were found in the three bone pits. The strange arrangement of bones within these three bone pits (a pile of 28 skulls stacked on top of one another and long bones arranged in geometric patterns) indicates directed, symbolically significant, and most likely ritual reburial practices. Inclusion of the beads in these complex and, as of yet, un-deciphered rites suggests their participation in this ritual.

However, while beads may have had ritual functions in the mortuary contexts at Ras al-Jinz, the specifically external beads cannot be determined as having any special funerary significance. Certainly, many of the beads with external associations were found in burials, but because the two collections are so overwhelmingly disproportional, with over 95% of the beads coming from RJ-1, this does not carry the same significance that Cleuziou associates to the Jemdet Nasr pottery. Ironically, that the alien beads are not distinguishable from local beads in this way is, perhaps, the most significant conclusion one can draw from these circumstances. Unlike the aforementioned ceramics, these beads do not retain distinguishing significance as a symbol of external contact. Present in all contexts in which local beads are present (i.e. homes, workshops, graves) and worn often on the same strands as locally made beads, the alien beads appear to have shed their exotic allure to the point that they reach full inclusion into local traditions. This cultural appropriation of the external beads is one step towards dissolving the cultural barriers between civilizations.

Finally, the square steatite spacer bead of RJ-1 (DA16277-b) [Figure 48] which incorporates an Iranian style with local materials exemplifies the culmination of this gradual process of integration. The initial imports which would ultimately produce this bead type had been present in Oman for an extended period of time when Tomb 1 of RJ-1 was constructed. The earliest square spacers appear during the Hafit period along with other Iranian goods. Made of the same artificial materials as the Iranian beads and only found in cairn burials, this early stage in the spacers' integration demonstrates both acceptance into the culture and segregation, like Jemdet Nasr pottery, to a hallowed position of exotic status. Over time, these beads became so assimilated into the ornamental culture of Oman that the style was appropriated for production using Omani materials. A seamless blend of external and internal traditions, the square steatite spacer bead and its development illuminate the evolving cultural incorporation of the Umm an-Nar as they develop relationships with foreign peoples.

V.B.2.b Cultural Export-Implications for Foreign Civilizations

Considering the interaction from the other perspective, the bead donors in an exchange demonstrate an effort to share a significant cultural meaning. Excavations and texts in ancient Mesopotamia, Egypt and the Indus reveal widespread use of local beads as protectors, identifiers and preservers of "an individual's place in society and the natural environment" (Kenoyer 1991: 82). At least two of the external bead types found at Ras al-Jinz have been identified as having similar specific cultural importance in their home countries. Vidale postulates that Indus paste discs are used as class or community identifiers (1989:299) and Eisen connects melon-beads with lotus-beads according to their "amuletic nature"(1930:20). If these two interpretations hold true, then the presence of each of these bead types in the Omani collections represent an openness of the foreign peoples to share deeply cultural symbols of status and power with the developing Umm an-Nar community.

The exchange of beads and bead technologies and styles indicate an exchange of culture in its most abstract forms. As the East Arabian people broadened their symbolic concepts, their partners were exposing their beliefs, sharing them with other peoples. In this way, the EBA trade throughout the Persian Gulf and Arabian Peninsula began to break down the barriers separating civilizations, even as those civilizations were forming.

VI. Conclusion

Individual beads as well as over-arching patterns within the RJ-1 and RJ-2 bead assemblage illustrate several key elements of the systems of exchange and development occurring in Early Bronze Age Oman. Providing a new stage for observing contact between the Umm an-Nar and their overseas partners, the beads of Ras al-Jinz make important contributions to modern interpretations of cultural and economic exchange. Being fundamentally cultural items, the Ras al-Jinz beads had a unique capacity to present a continually growing cultural dialogue in the form of shared symbolic, artistic, or ritualistic values. On the other hand, the economic implications springing from divergent etiological theories illustrate intercultural exchange patters and domestic industrial organization.

The disparate theories of economic contingency reveal the vast amounts of work yet to be done with these collections. A first survey of the intercultural implications of the RJ-1 and RJ-2 bead collections, it might seem that twice as many questions were raised as answers were found during the course of this investigation. Chemical analysis of the bead materials might help determine the source. Experimental reproduction could confirm the manufacture processes for the Omani faience. A botanist or archaeobotanist might be able to determine the specific seed type on which DA8562 was modeled, and investigators trained in economics would certainly be better able to extract the economic implications of these exchange patterns. Finally, an understanding of the ritual functions of beads in burials may become decipherable as investigations reveal more information regarding the RJ-1 burials and reburials. Yet, the conclusions drawn in this paper and the uncertainties left behind are, and will continue to be, important topics of investigation as more information comes to light.

The interactions of Umm an-Nar with external cultures is significant and worthy of study because Eastern Arabia was a significant factor in the Middle Asian Interaction Sphere. To gain a complete picture of regional trade patterns in the 3rd millennium BC, one must understand these relationships. Furthermore, these ancient trade patterns have real applications in modern life as the first predecessors of global markets and cultures. Certainly, cultural and economic relationships between the small, developing Oman and the cultural and economic giants of its day foreshadows present relations between nations of vastly different political, economic and social statuses—the "developed" and "developing" countries. Ultimately, the correspondence of cultural and political development in economically driven relations at the very beginning of organized large-scale intercultural contact has implications for a modern understanding of globalization in today's world.

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