

Figure 1. Ancient bead sites of Myanmar.

BEADS OF MYANMAR (BURMA) Line Decorated Beads Amongst the Pyu and Chin

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Introduction

The use of beads is common amongst many of the ethnic groups of Myanmar. Antique beads are valued for their inherent ancestral potency, and are used together with newer beads. This combination of ancient and modern is particularly striking amongst the Chin peoples. Old beads favoured by the Chin originate from Pyu and Mon sites dated to the early first millennium A.D.¹ These include zoomorphic as well as geometric shapes, although the Chin preference is for geometric beads such as spheres and cylinders, especially those decorated with linear patterns. The most common line decorated bead shape, whether ancient or modern, is spherical. Repetition of patterns on various bead forms, however, suggests that designs were significant whatever the shape. The Pyu sites of Maingmaw(: $\{\mathcal{G}\mathcal{E}:\omega\sigma\}$) and Waddi ($\sigma\sigma$):, for example, are some sixty kilometres apart but possess almost identical sets of beads (see map 2). The importance of pattern is also borne out by finds of black Pyu beads with white lines made by three different techniques: painting, incising, and an alkali resist. In the first technique, the white lines are painted on the surface. In the second, illustrated in the Appendix with an example from Taungthaman, the pattern has been cut into the bead, filled with white, and then polished. The third method involves the use of a resist material to paint lines on the bead. The bead is then baked and the surface

blackened, except under lines painted with the resist. The black colour penetrates to a depth of one millimetre, although often the colouration is much shallower. The pattern of white lines is revealed when the resist is removed. This technique is similar to South Asian methods described as "etched."²

These methods have been used to decorate beads made of bone and non-fossil wood, opalized fossil wood, and a black material, *mahuya* (عرم م). This last has been variously translated as a "chalcedony" (including agate, carnelian, and onyx, all cryptocrystalline types of the silica mineral quartz), and as "jet."³ Decorated carnelian beads



Figure 2. Maingmaw and Waddi

are rare, although undecorated spheres are quite common, and Chin use of ancient and modern examples continues to the present day. However, the Chin most highly value black beads with lines, again both Pyu and modern.

It is this interface between Pyu and Chin which is the focus of the present article. A database of ancient Pyu beads forms the Appendix. This illustrates and describes spherical, cylindrical and flat Pyu beads, decorated and undecorated. All have provenance, either excavated by the Department of Archaeology,4 or verified by Myanmar bead scholars.⁵ The Appendix is a survey of design categories rather than a quantitative analysis of ancient beads. The Appendix drawings are to scale, with notes on provenance, materials, and measurements contained in the database accompanying the illustrations. The beads are primarily from the Pyu sites of Srikshetra, Beikthano, Maingmaw, Waddi, Nyaungyan, Beinnaka, Taungthaman, and Kadaw. While some examples from Halin are illustrated, most are undecorated, and it appears that Halin is richer in yellow and green stone beads than line decorated black and white types. A few examples have been included from the contemporaneous Mon sites of Sanpannagon (Hmawbi), south of Thaton, and Kyaikkatha (see map 1). To date, spherical black and white beads have not been found at Mon sites in Myanmar, although the Appendix includes a black barrel with white lines from Sanpannagon and a cylindrical banded agate bead from Kyaikkatha.

A total of 127 beads are illustrated in the Appendix: spherical (24), barrel (60), cylindrical (31) and flat (12). There are twenty-four spherical beads: twelve black with white lines, two orange with white lines, and ten undecorated. The number of vertical lines ranges from six to twelve, with the greatest number on larger beads.

Noted in the Appendix is a black and white bead recovered from surface survey at Taungthaman, a Neolithic–Pyu site south of Amarapura. This bead (10 mm in diameter), is made of *mahuya* and has ten vertical incisions which have been filled with a white feldspar substance (courtesy U Pin Ya, Taung Lelon Monastery; personal observation U Hla Gyi Maung, Department of Archaeology, 1992).

Horizontal lines are also seen on decorated spheres, from Maingmaw, Waddi and Shrikshetra. Other patterns include zig-zags, arrows, circles and dots. Several designs seen on spherical beads are replicated on barrels, but in some cases, only one bead of a particular pattern has been recorded, or a design found only at one site. For example, the spherical bead (no. 7) decorated with twelve pentagons, has only been recovered from Maingmaw. Of note are two similar dodecahedron beads from Taxila, with white "etched" lines on black agate (Beck 1941, pl. II, nos. 1 and 18). For other unique patterns from Maingmaw, however, a South Asian prototype has yet to be found. An example is the "arrow" motifs on bead no. 11, which was turned up by ploughing in the centre of the ancient enclosure of Maingmaw at the time of excavations there (Department of Archaeology 1978).

The decorated spherical beads range in size from four to twenty millimetres, with undecorated spheres reaching forty millimetres. Kadaw has been particularly rich in five to ten



Figure 3. Three barrel beads made by U Ba Kyi, 25–30 mm in length, collection U Aung Myint.



Figure 4. Six-line black and white bead from Maingmaw, diameter 10 mm, collection U Aung Myint.



Figure 5. Orange carnelian cylinder, length 30 mm, collection U Maung Maung Tin.

Figure 6. Barrel bead from Maingmaw, 28 mm length, showing opalized interior, Mandalay Museum.

Figure 7. Assorted beads from Srikshetra including wooden bead (no. 86), 16 mm length, collection U Win Maung.

Figure 8. Spherical black and white bead from Srikshetra, similar to bead no. 5 from Maingmaw, 12 mm diameter, collection U Win Maung.

millimetre black beads with six vertical white lines, while an eight millimetre example with no thread hole was found at Maingmaw by U Ngwe San, a villager. Two other similar beads, measuring ten and eleven millimetres and bored, were also reported from Maingmaw by villagers U Chit and U Sein Ko. During 1980, excavations at Maingmaw by the Department of Archaeology under U Sein Maung Oo, black beads with line decorations were found mixed with ashes in terracotta jar burials outside the city wall. Additional finds at the gravesite included miniature pots and green, orange, and white beads.

On a number of spherical carnelian beads, part of the surface is covered with a white milky layer (e. g. no. 15). Nine out of a string of forty spherical beads from Srikshetra (now on display at the National Museum, Yangon) display this milky coating. It was also observed on a number of examples collected at Nyaungyan (field survey U Maung Maung Tin and U Aung Myint, 1978). While bead experts in Myanmar describe this as a natural quartz layer, Beck notes similar beads from Taxila, and ascribes the white colouration to an alkali treatment (Beck 1941, 5). As chemical tests on the Taxila beads revealed a large amount of soda on the surface, similar tests on this type of bead from Myanmar should resolve the nature of the coating.

There are sixty barrel beads illustrated in the Appendix. They include: twenty-two black with white lines, eleven orange with white lines, two white with black lines, a bone example with white lines, and twenty-four undecorated. The designs are generally symmetrical, although exceptions occur, such as the orange line decorated bead from Srikshetra (no. 29), with angled lines grouped at one end of the bead without the usual bands which appear at the other end. The two barrels with black lines come from Maingmaw (nos. 59 and 60). One is made from a grevish stone; the other is tusk or bone and lacks a thread hole. Both provide important evidence of experimentation on all available materials. The barrels range in size from five to sixty millimetres in length. The undecorated examples include crystal from Beikthano and Srikshetra (the larger examples), and banded agate, with colours varying from blue, to white, grey and black.

The cylindrical beads number thirty-one, with undecorated being the most numerous, twenty-five. Five black cylinders with white lines are shown, and one fossil wood bead (not opalized), cut but not filled. No orange cylinders with white lines are shown. Lastly, twelve flat beads are shown, ten squares and two rectangles. Ten are black with white lines, with only one orange with lines. Although less common than black, other orange flats have been recorded, at Maingmaw, Waddi and Srikshetra. The designs are found on both sides of the flats, and, in some cases, a different pattern is on each side. The thread holes are generally diagonal except in the rectangles, where the hole runs the length of the bead.

Undecorated bead materials include: carnelian, crystal, banded onyx, amber, jasper, jade, and amethyst. The absence of line decorations on amber, jasper, and jade is not surprising as only fibrous forms of cryptocrystalline quartz will take up colour in solution (Glover, personal communication, 1992). It is notable that line decorations are only seen on black, whitebrown (bone), and orange coloured beads.

Line Decorated Beads: "Chin," "Pyu" and "Pumtek"

The only man-made patterning on beads found in Myanmar is lines. Further research is required to understand the significance of the patterns. Parry illustrated beads with named designs (1932, 290), but did not explain the names. Ebbinghouse speculated that designs were misinterpreted on more recent beads, based on a lack of odd-numbered designs in favour of more easily produced even designs (1991, 13). Allen (1986) has concluded that the most frequent design on spherical and oblate black and white beads is longitudinal lines, with six or twelve lines being common.

The black and white beads described by these authors are called *puntek*, and like the use of black and white beads in Myanmar, have both an archaeological and ethnographic context. They have also received attention, in recent years, following their appearance in the bead market of New Delhi in 1983 (Ebbinghouse 1991, 1). Ethnographic surveys suggest that the use of *puntek* has been primarily amongst the Haka Chin and the Lakher (also known as Mara), two of many groups in the area around the Pakistan, India, Myanmar border region (Civico 1991, 4).

In Myanmar, these black and white beads have been variously labelled "Pyu," "Mon," and "Chin." The range of shapes and sizes are similar to *puntek*: spheres (c. 9–19 mm diameter), cylinders (25–50 mm length), and flat squares (c. 25 mm diagonal) (Civico 1991, 2).⁶ As mentioned earlier, the black and white beads have been made from a range of materials, including stone and opalized wood. There has been a presumption that stone examples were older, and the fossil wood beads were made recently in imitation of stone originals (see for example, Ebbinghouse [1991] quoted in Civico 1991, 12). However, the abundance of opalized wood beads excavated from Pyu sites testifies to the antiquity of this material in Myanmar bead production.⁷

The term "Pyu" is also problematic. A reliable body of radiocarbon dates for Pyu material is lacking, as is detailed stratigraphic comparison of the artefacts from excavated sites. There is also ambiguity surrounding the presumed sequence of so-called Neolithic and Pyu periods in Myanmar. At the site of Taungthaman (Amarapura), for example, Neolithic stone tool and ornament use is associated exclusively with subsurface layers and not with surface finds of Pyu items such as beads.⁸ Nonetheless, numerous stone objects have been found on the surface at Taungthaman, including tools and nine-pointed bracelets. The nature of the Bronze and pre-Pyu Iron Ages merits investigation at other sites in the Mandalay region, such as Shwezayan, where evidence of stone tool manufacture has been recorded (personal communication, U Hla Gyi Maung, Department of Archaeology, Myanmar, 1992).

Figure 9. Assorted beads including bead no. 127, flat with white lines, 9 mm wide, collection U Maung Maung Tin.

Figure 10. Assorted orange beads with white lines including bead no. 12 (spherical with single white line, 4 mm diameter), no. 33 (barrel, 9 mm length).

Links between the Pyu and the Chin

Black and white beads have been popular for an unknown length of time amongst the Chin peoples in Myanmar, and are known locally as "Chin" beads, even when excavated from a Pyu site. Many Chin, now or in the recent past, inhabited former Pyu areas.⁹ The link between the Chin and the Pyu is also found in traditional accounts. After the fall of Srikshetra in the ninth century A.D., the Pyu are said to have dispersed into four areas: the Arakan, Tavoy, the Inle Lake area, and the Yaw region (Zabu Kuncha, 1965). Chins who previously occupied sacred Mt. Popa fled to nearby hills. Chins in the Yaw township, west of Mt. Popa and across the Irrawaddy River, are still said to point in the direction of Mt. Popa when asked where they originated from.

Figure 11. Black and white bead from Beikthano, illustrated in U Aung Thaw, Excavations at Beikthano, plate LII, a; cut to display interior by Department of Archaeology, now on display Yangon Museum.

Figure 12. Orange barrel and incised black and white bead (10 mm diameter) from Taungthaman. Shown with tubular bead (47 mm length), also recovered from surface survey at Taungthaman. Courtesy U Pin Ya.

Although the Haka Chin valued the black and white beads more highly than any other, Chin strings of black and white beads are often mixed with other more brightly coloured beads (Carey and Tuck 1896, quoted in Civico 1991, 5).¹⁰Several strings of Chin beads in the National Museum, Yangon, are made up of carnelian, bone, amber, glass beads, and silver coins, as well as black and white line decorated beads.¹¹ These were donated to the museum as intact strings by a Chin man in 1967 (U Kyaw Win, National Museum, Yangon, personal communication 1992).¹²

In 1904, the Deputy Commissioner of Myingyan District recorded the find of some ancient beads in a burial ground (District Commissioner Administrative Reports). The cemetery was part of an old Chin town where Pyu beads had been previously reported.¹³ This association of the beads with ancient graves may account for their heirloom value, but does not tally with traditional accounts which describe the beads as the droppings of a well-fed goat.¹⁴

Whatever their origin, the black and white beads were valued by the Chin as a currency in debt exchanges, in marriage negotiations and as family heirlooms (Head 1955, 48; Parry 1932, 290; Civico 1991, 5–6). In fact, if the most valued beads were sold, the owner was said to risk illness and his wife would become barren (Head 1955, 48). The acquisition of beads was not restricted to marriage exchange, for women would purchase beads whenever possible (Carey and Tuck 1986, 173).

Black and white beads were particularly significant at the time of marriage. Fifty to one hundred black and white beads might be asked as a bride price by the father of the bride, although the final payment might be only thirty to seventy (Head 1955, 5). Part of the price paid by the groom's family to the aunt of the bride was beads, along with metal items such as a knife and bowl (Head 1955, 10–11).¹⁵ Beads, including red, honey–colour, and white, also formed part of the bride's dowry, but black and white beads were not part of the goods given by the wife's family, at least as observed by Head (1955, 14). Carey and Tuck also note that the woman brings, as dowry, her clothes and beads (1896, 189).

At death, beads, metal goods and textiles were placed in the Chin grave. The family grave, a stone vault within the living compound, would then be re-opened to receive the next corpse. At that time, heirlooms other than agricultural implements would be removed to pass on to living members of the family (Head 1955, 27,30; Carey and Tuck 1896, 192). Clay effigies of beads, along with anthropomorphic images, pots, gongs, and pigs, were also made as a guard against illness (Head 1955. 40).¹⁶

By the late nineteenth century, it was reported that Chins came down from the hills to the ancient Pyu villages in order to buy beads dug up by the current residents. They were followed by traders who purchased any available beads to sell to the Chins. By the early twentieth century, the demand for beads led to extensive looting of both real and supposed Pyu burial sites. During this "boom" period, onlookers and hawkers selling food and staples came from neighbouring villages. The accounts below are those of elderly persons who either took part in the digging or witnessed it at Maingmaw and Waddi.

Early Twentieth Century Bead-Digging

U Chit, from Maingmaw, watched digging in the old burial ground outside the Pyu brick walls, in the west sector of Nyaungbintha (a village on the western wall of the old city). U Chit, sixty-three years old at the time of interview in 1977, said he was about ten or twelve, making the date about 1922 or 1924. He recalled spherical and barrel-shaped beads, some black with white line designs, but also other colours such as orange, tomato-red, coral-like, brown, and green. Silver coins, gold beads, and earplugs were discovered as well. Many coins and beads were mixed with ashes in earthen

pots. Most of the pots were single, but some had a smaller pot on top of the larger one.

The growing Chin demand for authentic Pyu beads made them valuable trade goods, with price depending upon size and design. For example, a spherical bead with six white lines fetched six *kyat* (about US\$10 today), one with ten lines was ten *kyats*, while intricate designs sold for much more. The business was so good that soon many began digging, and disputes and fights broke out about who had rights to which spot or site. In the 1970s, the administrative authorities finally tried to prohibit digging altogether (Aung Myint 1978).

During preliminary field survey at Waddi in 1979, interviews were held with some elderly people who had witnessed or participated in the digging for beads. Daw Than, who was sixty-seven years of age in 1979, of Payagyi village, near the ancient site, gave this account: "I was a young girl when I saw such digging for Chin beads in our village. It was crowded with the diggers, the buyers and the onlookers. The food stalls sprang up and hawkers came about, as if it was a village pwe (music and dance performance) going on. Even people from other villages, as far as Thedaw and Kanywa came to our place."

She said that Chin black and white beads were the most favoured articles. The digging was generally made in the *Mycni-gyin*, "red-earth ditches," as the villagers called them. Another location was an undulating red lateritic area on the east of Waddi, thought to be an ancient burial ground. The variety of beads found was similar to those in Maingmaw. Daw Nge, age seventy-two in 1979, of Payagyi, reported that she came across some small gold beads and also a small piece of gold which resembled a flower.

Present Day Bead Production

Some broken and unfinished beads, barrels and spheres without holes, were found in Waddi and Maingmaw. Unsuited for use as earplugs, the unfinished spheres offer definite proof of local manufacture. The barrel beads were initially recorded as earplugs due to their lack of holes (Aung Myint 1978), but the subsequent find of undrilled spheres suggests that the elongated ones were also unfinished.

The existence of partially finished beads is further supported by reports of village elders that the bead trade was so good during the 1920s, that all the finished beads that could be dug up were quickly sold. The previously rejected beads without holes were then collected, bored and sold, until the supply of unfinished beads was also exhausted. The popularity among the Chin for beads from Pyu sites was such that by the 1940s, a well-made bead could reportedly sell for thirty to forty *kyat*. Finally, all ancient bead stocks, including newly bored antique beads, were depleted. As a consequence, artisans began to try to manufacture beads to satisfy the Chin market.

The most successful of these was U Ba Kyi, interviewed in 1978, at the age of seventy-three. At that time he was still living in his native village of Payagyi, just outside the ancient brick

Figure 13. U Ba Kyi, age 75, displaying his black and white beads, Payagyi village, 1980. Photo by U Maung Maung Tin, print courtesy Noel Singer.

wall enclosing the Pyu site of Waddi. He died there in 1984, but his granddaughter continues to manufacture beads, using his old polishing equipment and pigmenting recipes. The beads made by his technique are not quite as black as the ancient Pyu beads but are made from the same opalized fossil wood that has always been used on the site. U Ba Kyi perfected the "Pyu" methods; his beads sold well, principally because he was careful to use only the old patterns on the same parent material.

U Ba Kyi chose white opalized fossil wood found in abundance at Waddi. The opalized wood is called ingyin kyauk (xxxxxxxxxxxxxxx), literally "ingyin stone." Ingyin is formally Pentacem suavis, but ingyin kyauk commonly also includes thitya (Shorea obtusa), and, in (Dipterocarpus tuberculatus) (Rodger 1943, 10, Morehead 1944, 10). U Ba Kyi's technique for making white line decorations on black beads used a resist, prepared of slake lime, sand, soap and powdered borax. This was mixed with water to a gummy consistency (Aung Myint 1978). The pattern was drawn on the surface of the bead with this solution. When thoroughly dry, the bead was coated with an alkaline blackening solution of sodium arsenic trisulphite, copper sulphate, sulphur powder, and arsenic. U Ba Kyi's granddaughter uses the same recipe, with the inclusion of breast milk.17 The beads were then heated using a household charcoal brazier.18 After cooling, the beads were scrubbed thoroughly in water. The result when the resist was cleaned off was a black-bodied bead with white lines on its surface.19

U Ba Kyi's beads continued to be bought by the Chin until the 1950s when demand started to slacken. By the 1960s the

Figures 14 and 15. Chin women in the 1970s wearing black and white beads mixed with other varieties. Photos courtesy U Min Naing, former curator National Museum, Yangon.

trade had all but stopped. Perhaps, due to competition from others who had learned the technique, or, perhaps, because the Chin learned that the beads were new and lacked ancestral links, the value went down until the selling price did not cover even the production cost of the beads. The process came to a standstill. Nonetheless, in recent years, his granddaughter, Ma Khin San Thin, has continued the family tradition, living in her grandfather's house, using his treadle-operated polisher, and making black and white beads. She is able to sell all the beads she can manufacture to Chin people and traders that find their way to her village, although she may be neither the artisan nor salesman that her grandfather was, for both the quality and price of her beads are considerably lower than his.

Conclusion

A thousand years separates documented black and white bead manufacture by the Pyu and Chin. There is little evidence of the production of black and white beads after the Pyu period (c. first–ninth century A.D.), as is the case with finger–marked bricks (U Aung Myint and Moore 1992).²⁰ Black and white beads are also absent in subsequent royal cities, with no finds reported from Pyinnya, Inwa (Ava), Amarapura, or Mandalay. Black and white bead production was resuscitated in the twentieth century at a Pyu site where beads had been made a thousand years earlier. U Ba Kyi was a native of Payagyi; thus, he was not attracted to the village by the prospects of bead manufacture, but grew up there and began to make beads in response to Chin requests. This supports the account in Myanmar manuscripts described above, of the dispersal of Pyu peoples at the end of the first millennium A.D., with one of the regions settled by the Pyu corresponding to some Chin areas today.

Just as the portability of beads presents problems of dating, manuscripts recopied over the centuries clearly are open to debate. These accounts offer only a general explanation of the Pyu-Chin interface, with many questions remaining. Usage varies, the Pyu having been cremated and the ashes placed in urns with beads, whereas the most valued beads amongst the Chin have until recently been kept as heirlooms. Design significance has almost certainly changed as well. The Pyu interpretation of the patterns remains a mystery; names given by the Chin are today understood at a descriptive level only. While not claiming a remnant of Pyu in the Chin, the continued use of line decorated beads by the Chin offers insight into the range and depth of significances that beads might have held for the Pyu.

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NOTES

- There are numerous similarities between 1. the ancient beads of Myanmar and those excavated at sites in South Asia, such as Taxila (Beck 1941). The beads from Taxila are placed from the fifth century B.C. to the second century A.D., although stained or etched beads were produced from the third millennium B.C. onwards. The date and means of transmission of beads from South Asia to Myanmar remains uncertain, however, and is beyond the scope of the present article. Differences are also apparent, and it would seem that experimentation in bead making in Myanmar was not always modelled on South Asian methods. For example, Beck (1941, 2) denies the presence of any beads which were incised with a white material inlaid, whereas beads do appear to have been produced by this means in Myanmar.
- The use of the word "etched" in referring to white lines designs on beads does not always seem to imply the disruption of the surface seen on some Myanmar beads. For example, Glover (1989, 24) mentions that designs are "etched, or stained" in describing the most common type of etched beads, the white line on red or black stones as classified by H. C. Beck (1933); Mackay (1933); and Dikshit (1949).
- 3. Most Myanmar dictionaries define mahuya as jet, a dense form of lignite coal (E. g. Tin Tin Neung, *Thalin Dictionary*), with Judson (Stevenson, Evelth 1921) being the only source translating it as chalcedony. Jet was popular as mourning jewellery in Victorian England, although black agate was often used in imitation of jet. It is possible that the ambiguity in translation is a result of Europeans mistaking jet for agate.

Mahuya is also occasionally used to refer to tourmaline. Deposits of gem quality black tourmaline are found in the Mogok District. However, tourmaline is considerably harder than jet (7.0–7.5 versus 2.5–4.0), even harder than chalcedony (6.5–7.0). Thus the black *mahuya* which was incised for line decorated beads was most probably jet.

In Myanmar, *mahuya* stone reputedly has the power to pull out poison. The word is similar to Head's *mahooya* (1917, 10, 12). Opalized wood was and is far more common than chalcedonies as the basis for black and white beads in Myanmar. The common word at first suggests initial chalcedony imports followed by replication in local materials. However, with the identification of *mahuya* as jet, not chalcedony, this is put into question. Carnelian, in contrast, is more readily available in Myanmar, and does not pose similar questions of origin and replication.

Opalized wood was not seen as a bead material at Ban Don Ta Phet, Thailand, an early first millennium A.D. site which yielded some 3000 beads, mostly glass, from burial contexts (Glover 1989, 21). However, only about fifty of these were decorated, nine with designs similar to "pumtek" (Civico 1991, 12).

- 4. Department of Archaeology officials include U Aung Thaw, U Myint Aung, U Than Swe, and U Sein Maung Oo.
- U Maung Maung Tin (M. A., Member Historical Commission), U Win Maung (Tampawaddy), U Aung Myint (retired Conservator of Forests), or U San Win (Assistant Research Official, Historical Research Centre, University of Yangon).
- 6. This unpublished study was submitted in partial fulfilment of the requirements for the degree of B.S.C. Hons of the University of London. It was primarily based on analysis of two strands of black and white beads, one of ninety-six beads and the other of sixty beads. The first was purchased in London but said to come from India, while the second was purchased in Thailand near the Myanmar border.

- 7. Ebbinghouse (1991) also hypothesizes the introduction of black and white beads by foreigners, and the importation of agate. However, it does not seem certain that all agate was imported nor that, as he states, Pyu culture was uniform.
- Previous publications citing the presence of black and white beads in burial contexts at Taungthaman (Stargardt 1990, 24) were not confirmed from U Sein Maung Oo, the excavator of the site or from Department of Archaeology records.
- 9. Reported sources for black and white beads earlier in this century include Mandalay, and Gangaw in the Pakokku District (Civico 1991, 8; Head 1955, 48). The bead-making site of Natogyi (Waddi) is midway between Mandalay and Pakkoku, in turn across the Irrawaddy River from the Myingyan District mentioned in the 1904 report discussed in the text. The bead site of the 1904 report may refer to Natogyi (Waddi), which is in the Myingyan District.
- 10. Thus, black and white beads were found both mixed with other types, and as the only type of bead on a string. The two strings studied by Civico (1991, 3) consisted entirely of black and white beads. He compares these to strings worn by Haka Chin women having round beads at the front and cylindrical ones at the back around the nape of the neck. Parry (1932) also illustrates a string of all black and white beads including spheres, cylinders, and flats, worn by a Lakher chief (an Assam group similar to the Haka Chin).
- This mixture of bead materials was typical also of Chin strings photographed by former Curator of the National Museum, U Min Naing in the mid-1960s.

- 12. While most of the line decorated beads are black and white, white on orange beads are also on these strings. The star pattern on the silver coins is similar to that found on terracotta ear plugs excavated at the Pyu site of Maingmaw, now on display at the Mandalay Cultural Museum.
- 13. The Deputy Commissioner confiscated the horde of beads, rewarding the local authorities with seventy–seven *kyats*, a handsome amount at that time. Their present location is unknown.
- 14. This tradition is similar to Tibet, where *dzi* beads are sometimes said to grow spontaneously in Yak dung.
- 15. The hierarchy of bead types, and their use in exchange systems along with metal goods and textiles, is reminiscent of the place of metal *mamuli* and *ikat* textiles on the island of Sumba in Indonesia (Rodgers 1985). Similar also is the location of graves in the centre of the village compound (Adams 1969).
- The inclusion of beads among the grave goods is noteworthy, although the Chin custom of inhumation differs from the

evidence for cremation offered by Pyu urns with beads. In this context, the presence of beads in relic caskets at Taxila (Beck 1941, 1) is perhaps more relevant and chronologically appropriate.

- 17. This may certainly have been an ingredient for U Ba Kyi, as well, which was not recorded, partly through delicacy; but, U Ba Kyi also said that the results were the same with or without the breast milk. In addition, Ma Khin San Thin reports the use of malachite in blackening the beads. Further visits to the village are needed to resolve these discrepancies.
- 18. The use of heat to enhance the colour of the bead is common, for example to turn carnelian from salmon pink to red. Black agate may be darkened by boiling in a sugar solution. In both cases, the parent material is a chalcedony quartz whose fibrous structure encourages absorption (see Glover 1989).
- Mackay and Beck refer to a medium madefrom carbonate of soda and crushed shoots of the kirar plant (*Capparis aphylla*) (Glover 1989). These were made into a paste and then applied before baking

over a charcoal brazier. Further experiments were carried out by Mackay and Beck; by Williams, under Glover's direction at the Institute of Archaeology, London; and by Kenoyer in the United States. They all found that the mixture produced white designs, but that the plant shoots were only necessary to provide a gummy medium. Interestingly, in light of U Ba Kyi's use of sodium arsenic trisulphate, tests at the Institute of Archaeology using Energy Dispersive x-Ray Analysis were unable to detect sodium except on one bead from Kish in Lower Mesopotamia and the contemporary beads made by Williams (Glover 1989, 25).

20. However, a recent (1992) field survey by U Aung Myint at Pagan did yield some finger markings on bricks associated with earlier monuments. These included circles and broad stripes.

> Although a black and white bead has been documented in Kang Ganga village south of Pagan, this is generally placed with the other evidence of Pyu occupation of the area prior to the ninth century A.D. founding of Pagan (UAung Kyaing, Department of Archaeology, Pagan; personal communication 1992).

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APPENDIX BEADS OF MYANMAR

FIGURE 16. SPHERICAL BEADS

- SPHERICAL with white lines, (black; six vertical bands; 5 mm diameter): Kadaw; Department of Archaeology. Spherical beads with vertical lines range in size from 4–20 mm, with the number of bands varying from six to twelve.
- 2. SPHERICAL with white lines, (black; twelve vertical bands; 15 mm): Maingmaw; Mandalay Cultural Museum.
- 3. SPHERICAL with white lines, (black; five horizontal bands; 12 mm diameter): Srikshetra; Department of Archaeology. This size and design was also recovered from Maingmaw.
- SPHERICAL with white lines, (black; three horizontal bands and eight short vertical lines; 10 mm diameter): Maingmaw; Mandalay Cultural Museum. The same design is seen on tubular barrel beads.
- 5. SPHERICAL with white lines, (black; three horizontal bands and two zig-zag lines; 12 mm): Maingmaw; Department of Archaeology. The same type of beads has been found during surveys at Waddi but with wider lines at top and bottom.
- 6. SPHERICAL with white lines, (black; three horizontal bands; 8 mm diameter): Maingmaw; Department of Archaeology.
- 7. SPHERICAL with white lines, (black; polygonal design formed between six vertical bands; 11 mm diameter): Maingmaw; Depart-

ment of Archaeology. This type of bead has only been found at Maingmaw.

- SPHERICAL with white dots, (black; three wide horizontal lines and two zig-zag bands; 14 mm diameter): Maingmaw (unpublished report); Department of Archaeology.
- SPHERICAL with white lines, (black; two horizontal lines at top and bottom with band of diamond shapes around middle; 12 mm diameter): Maingmaw (unpublished excavation report); Department of Archaeology.
- SPHERICAL with white lines, (black; two circular lines at top and bottom with interlinked "arrow" motifs in band around centre of bead; 12 mm diameter): Maingmaw (unpublished excavation report); Department of Archaeology.
- 11. SPHERICAL with white dots, (black; eight white dots; 7 mm diameter): Srikshetra; collection U Win Maung (Tampawaddy). A similar pattern to glass beads favoured by the Chin.
- 12. SPHERICAL with white line, (orange carnelian; a single white line covering about half the bead surface; 4 mm diameter): Srikshetra; collection U Win Maung (Tampawaddy). A unusually small bead, with a single very broad white band on an orange surface.

BEADS OF MYANMAR

FIGURE 16. SPHERICAL BEADS

FIGURE 17. SPHERICAL BEADS, CONTINUED

- SPHERICAL with white circles, (black; six white circles around middle; 12 mm diameter): Srikshetra; collection U Win Maung (Tampawaddy). Similar to bead no. 14, but black rather than orange.
- SPHERICAL with white lines, (orange carnelian; single white line at top and bottom of bead with four white circles around middle; 12 mm diameter): Beinnaka; collection U Win Maung (Tampawaddy).
- SPHERICAL undecorated, (brownish-orange carnelian with milky white coating; 15 mm diameter): Srikshetra; National Museum Yangon.
- SPHERICAL undecorated, (deeply saturated coffee colour carnelian; 17 mm diameter): Maingmaw; collection U Maung Maung Tin.
- SPHERICAL undecorated, (orange carnelian; 15 mm): Shrikshetra; Department of Archaeology Yangon.
- 18. SPHERICAL with white circles, (yellow-orange carnelian; three white circles; 8 mm diameter): Srikshetra. This bead was recovered by villagers while sieving for gold in the area.
- SPHERICAL OVAL undecorated, (purple amethyst; oval; 14 mm at its widest): *Beikthano; Department of Archaeology*. Recovered during Beikthano excavations (U Aung Thaw 1969).

- SPHERICAL undecorated, (orange carnelian; rounded irregular; 18 mm high with a diameter of 17 mm at broader end): Beinnaka; collection U Win Maung (Tampawaddy). Found at Beinnaka, Pyawbwe township (U Win Maung 1981).
- SPHERICAL undecorated, (crystal; sphere; 17 mm): Halin; Department of Archaeology. The bead is in the collection of the Department of Archaeology. Similar spherical crystal beads (8 mm) have been found in Thaon, Sinbyukyun village (U San Win 1985, not illustrated).
- 22. SPHERICAL undecorated, (unidentified white stone; 13 mm diameter): *Maingmaw; Department of Archaeology.* The hole has not been bored (UAung Myint 1978); a similar bead of white stone was found in Thaton, Binhlaing, with thread hole (U San Win 1985, not illustrated).
- SPHERICAL undecorated, (orange carnelian; 27 mm diameter): Srikshetra; National Museum, Yangon. The largest spherical bead yet reported, found during excavations at Srikshetra.
- 24. SPHERICAL undecorated, (orange carnelian; oval; 40 mm on longer axis and 25 mm along thread hole axis): Srikshetra; National Museum, Yangon This bead is an orange-red, whereas the previous bead is a deep dull red.

FIGURE 17. SPHERICAL BEADS, CONTINUED

FIGURE 18. BARREL BEADS

- 25. BARREL with white lines, (black; three horizontal lines on each end and two zig-zag lines in middle; 30 mm long, mid-diameter 11 mm, end diameter 8 mm): *Maingmaw*. There is no thread hole, and the badly weathered surface has faded to a greyish brown colour. It was dug up in the old city of Maingmaw by villager U Hla Aung (U Aung Myint 1991).
- 26. BARREL with white lines, (black; two horizontal lines on either end with two rows of triangles in the mid-section; 32 mm length): Maingmaw; recorded during survey of site, owned by villagers.
- 27. BARREL with white lines, (black; zig-zag lines; broken, 27 mm length): Maingmaw; recorded during survey of the site. As this bead is broken, the white body can be seen. The deepest penetration of the black surface is 1 mm but much shallower in most places.
- BARREL with white lines, (black; three lines on either end and row of angled lines in middle; 30 mm): Maingmaw; recorded during survey of the site. No thread hole.
- 29. BARREL orange with lines, (orange carnelian; three white lines on one end and horizontal angled lines on the other; 23 mm length, 12 mm diameter): Srikshetra; collection U Win Maung (Tampawaddy). An unusually asymmetric bead.
- 30. BARREL with white lines, (black; two lines at either end and three zig-zag lines in middle; 30 mm length): Maingmaw; recorded during field survey of the site. No thread hole. The design of this bead, "tiger tail", is considered most valuable if the triangles

touch the end lines. A number of examples have been recovered from Srikshetra as well as Maingmaw.

- 31. BARREL with white lines, (black; two white lines at either end with polygonal pattern in middle similar to spherical bead no. 7; 27 mm length): Maingmaw; recorded during field survey of the site. The design of this bead is known as "land tortoise". Like "tiger tail", these names are current ones given by bead-makers, and not thought to be the Pyu or Chin designations.
- 32. BARREL with white lines, (pink-orange carnelian; four vertical lines with connecting horizontal spacers; 17 mm length and 10 mm end diameter): *Srikshetra; collection U Win Maung (Tampawaddy)*. The thread hole on the bead is only partially complete.
- 33. BARREL with white lines, (orange carnelian; three horizontal white lines and white line of zig-zags; 9 mm length, 6 mm diameter): Srikshetra; collection U Win Maung (Tampawaddy).
- 34. BARREL with white lines, (black; 8 mm length, 10 mm end diameter): Srikshetra; collection U Win Maung (Tampawaddy). The bead is a truncated barrel, with small crescents cut into the wider end. It is not broken, being a very well finished bead.
- 35. BARREL with white lines, (black; two white lines at either end with triangles on middle section; 26 mm length): *Maingmaw; recorded during field survey of the site.*
- BARREL with white lines, (black; four white diamond shapes around barrel; 27 mm length): Kadaw; collection U Maung Maung Tin.

FIGURE 18. BARREL BEADS

FIGURE 19. BARREL BEADS, Continued

- 37. BARREL with white lines, (black; a single white line on either end with eight zig-zag lines in middle; 66 mm length): *Maingmaw*; *Department of Archaeology*. The bead which is illustrated is of a style typical for Maingmaw, and is very black.
- BARREL with white lines, (black; three zig-zag white lines; 26 mm length): Sanpannagon; private collection.
- BARREL with white lines, (black; two white lines on either end of bead; 26 mm length): Waddi; recorded during field survey of the site.
- 40. BARREL with white lines, (black; four zig-zag white lines; 25 mm length): *Waddi; collection U Maung Maung Tin.*
- BARREL with white lines, (black; two white lines on either end with two zig-zag lines around middle; 32 mm length): Waddi; collection U Maung Maung Tin.
- 42. BARREL with white lines, (black; three white lines on either end with horizontal lines on mid-section; 31 mm length): *Maingmaw; Department* of Archaeology. The pattern is similar to that on spherical bead no. 4.
- 43. BARREL with white lines, (beige bone parent material with three horizontal white lines; 9 mm length and 8 mm width): Srikshetra;

collection U Win Maung (Tampawaddy). The material of the bead remains unidentified, but it does not appear to have ever been coloured.

- 44. BARREL with white lines, (black; eight white lines around barrel evenly spaced along length of bead; 48 mm length): Waddi; recorded during field survey of the site.
- 45. BARREL with white lines, (black; two white lines around middle part of bead; 15 mm length): Maingmaw; recorded during field survey of the site.
- 46. BARREL with white lines, (black; four white lines around barrel evenly spaced along length; 18 mm length): Maingmaw; recorded during field survey of the site..
- 47. BARREL with white lines, (black; four diamond shapes around barrel of bead; 12 mm length with an end diameter of 4 mm): Maingmaw; recorded during field survey of the site. Similar design to no. 36 from Kadaw.
- BARREL with white lines, (black; two white lines on either end with eight zig-zag lines in middle; 62 mm length): Waddi; recorded during field survey of site.

BEADS OF MYANMAR

FIGURE 19. BARREL BEADS, Continued

FIGURE 20. BARREL BEADS, Continued

- BARREL with white lines, (black; three sets of white bands, one at each end and one in the centre; 58 mm length): Waddi; recorded during field survey.
- 50. BARREL with white lines, (orange carnelian; three zig-zag lines; 11 mm length, mid-diameter 5 mm, end diameter 4 mm): *Maingmaw;* collection U Maung Maung Tin.
- 51. BARREL with white lines, (orange-yellow carnelian; eight white bands evenly spaced along bead; 32 mm length, mid-diameter 14 mm, end diameter 7 mm): *Halin; collection Halin Bo Naga*.
- BARREL with white lines, (yellow-orange; carnelian; five zig-zag lines; 40 mm length, mid-diameter 12 mm, end diameter 9 mm): Taungdwingyi; collection Taungdwingyi U Hla Pa.
- 53. BARREL with white lines, (yellow-orange carnelian; six evenly spaced white lines; 28 mm length, mid-diameter 13 mm): Waddi; collection U Maung Maung Tin. The bead has very little taper, and has an ovoid cross-section. It is made of translucent material so it can easily be seen that the shadow of the thread hole is not straight.
- 54. TRUNCATED BARREL with white lines, (pink carnelian; four white line decorations, with one close to the large end of the bead and the other three arranged at the small end; 17 mm length, 7 mm diameter on larger and 5 mm diameter on smaller end): *Halin; collection Halin Bo Naga.*

- 55. HEXAGONAL BARREL with white lines, (black; three evenly spaced white zig-zag lines; 35 mm length; profile is somewhat hexagonal): Waddi; recorded during field survey of the site.
- 56. BARREL with white lines, (orange-yellow carnelian; five white line decorations evenly spaced; 21 mm length, end diameter 5 mm): Sanpannagon, Dattaw village; recorded during field survey of the site. U San Win 1985.
- 57. BARREL with white lines, (orange-yellow carnelian; five white line decorations evenly spaced; 22 mm length, 5 mm end diameter): Sanpannagon, Dattaw village; recorded during field survey of the site.
- 58. BARREL with white lines, (orange and black; black mid-section with orange ends, end sections separated from the middle by a white line; 45 mm length, mid-diameter 12 mm, end diameter 6 mm): Sanpannagon; recorded during field survey of the site.
- 59. BARREL with black lines, (greyish stone; three black zig-zag lines; 17 mm length and 5 mm diameter): Maingmaw; recorded during survey of site. No thread hole.
- 60. BARREL with black lines, (white tusk or bone; three zig-zag black lines; 15 mm long with a mid-diameter of 7 mm and an end diameter of 5 mm): *Maingmaw*; recorded during field survey of the site. No thread hole. U Aung Myint 1978.

BEADS OF MYANMAR

FIGURE 20. BARREL BEADS, Continued

FIGURE 21. BARREL BEADS, Continued

- 61. BARREL undecorated, (crystal; hexagonal; 21 mm length, 16 mm mid–diameter, 9 mm end diameter): *Srikshetra; Department of Archaeology*. The edges are smooth and rounded.
- BARREL undecorated, (crystal; hexagonal; 16 mm length, 12 mm middiameter, 7 mm end diameter): Srikshetra; Department of Archaeology.
- 63. TRUNCATED BARREL undecorated, (crystal; truncated hexagonal bicone; 26 mm length, 25 mm mid-diameter, 15 mm end diameter): Srikshetra; Department of Archaeology. The edges are slightly round and smooth.
- 64. BARREL undecorated, (crystal; cylindrical ovoid; 28 mm length, 17 mm mid–diameter, 11 mm end diameter): Srikshetra; Department of Archaeology. Smooth shallow depressions on the surface appear to have been purposely created as decoration.
- 65. BARREL undecorated, (green jade stone; plain; 51 mm length, mid–diameter of 9 mm and end diameter of 5 mm): Halin; collection Halin Bo Naga.
- 66. BARREL with white spots, (yellow–orange carnelian; 15 mm length, mid–diameter 7 mm and end diameter 4 mm): Srikshetra. The bead was found by villagers while sieving for gold. There are a total of 26 white dots on the bead, arranged in four rows of 6, 8, 7 and 5 dots.

- 67. HEXAGONAL BARREL with lines, (deep orange carnelian; hexagonal with four horizontal white lines; 15 mm length, middiameter 8 mm, end diameter 6 mm): Srikshetra. The bead was found by villagers while sieving for gold.
- 68. BARREL undecorated, (lac colour agate; 56 mm length, middiameter 9 mm, end diameter 6 mm): Maingmaw; Department of Archaeology. Recorded during field survey by U Than Maung, U Aung Myint.
- BARREL undecorated, (brown-yellow amber; 12 mm length, mid-diameter 8 mm, end diameter 5 mm): Beinnaka, Pyawbwe township; recorded during field survey of the site. U Win Maung 1981.
- BARREL undecorated, (brown agate; 18 mm long, 11 mm middiameter, end diameter 6 mm): Sanpannagon; recorded during field survey of the site. (U San Win 1985).
- BARREL undecorated, (brown agate; 13 mm length, mid-diameter 9 mm, end diameter 6 mm): Sanpannagon; recorded during field survey of the site. (U San Win 1985).
- BARREL undecorated, (yellow amber; 12 mm length, 5 mm diameter at mid-point): Thaton, Sinbyukyun; recorded during field survey (U San Win 1985).

FIGURE 21. BARREL BEADS, Continued

FIGURE 22. BARREL BEADS, Continued

- 73. SHORT BARREL undecorated, (brown agate; 5 mm length, 3 mm end diameter): Sanpannagon; recorded during field survey of the site (U San Win 1985).
- BARREL undecorated, (black onyx; white and grey natural zoning bands; 38 mm length, mid–diameter 10 mm, end diameter 6 mm): Kadaw, Myingyan district; unknown private collection.
- 75. LEECH BARREL undecorated, (black onyx; white and grey bands; 17 mm length, 10 mm high, end diameter 5 mm): Maingmaw; collection U Maung Maung Tin. The bead has a "leech" shape, with a laterally flattened cross-section. U Maung Maung Tin 1979.
- 76. OVAL BARREL undecorated, (black to dark brown onyx; one end of the bead is black, the other dark brown with a whitish grey middle portion flanked by two light brown bands; 23 mm length, 13 mm mid-diameter, 8 mm end diameter): Maingmaw; collection U Maung Maung Tin. The cross-section of the bead is oval.
- 77. BARREL undecorated, (black onyx; white bands; 16 mm length, mid-diameter 6 mm, end diameter 5 mm): Maingmaw; collection U Maung Maung Tin.
- 78. BARREL undecorated, (orange and white unidentified stone; divided into halves of orange and white longitudinally; 30 mm length, mid-diameter 10 mm, end diameter 5 mm): Sanpannagon, Dattaw village; recorded during field survey of the site.

- 79. ANGULAR BARREL undecorated, (green jasper; 29 mm length, 5 mm diameter): *Beikthano; Department of Archaeology*. Cross-section is quadrangular.
- ANGULAR BARREL undecorated, (yellow; carnelian; plain; 12 mm length, 8 mm wide at mid-point): *Halin; Department of Archaeology.* Bead is a short truncated bi-cone square.
- ANGULAR BARREL undecorated, (yellow amber; 25 mm length, 16 mm wide mid-diameter and 8 mm wide at ends): *Beikthano; Department of Archaeology*. Bead is a truncated circular bi-cone shape.
- BARREL undecorated, (yellow amber; 35 mm length, 16 mm wide mid-diameter and 8 mm wide at ends): Beikthano; Department of Archaeology.
- 83. ANGULAR BARREL undecorated, (orange carnelian; hexagonal; 55 mm length, 17 mm wide at mid-section): Beikthano; Department of Archaeology(National Museum, Yangon). One of the largest truncated bi-cones found at Beikthano. The illustration in the excavation report (U Aung Thaw 1969, 142–143) incorrectly shows an octagonal cross-section but is described as hexagonal.
- ANGULAR BARREL undecorated, (yellow carnelian; 29 mm length, 10 mm wide at mid-point): *Beikthano; Department of Archaeology*. A truncated square bi-cone (U Aung Thaw 1969).

FIGURE 22. BARREL BEADS, Continued

FIGURE 23. CYLINDRICAL BEADS

- CYLINDRICAL undecorated, (black onyx; single white band in middle; 13 mm length, 14 mm diameter): Maingmaw; collection U Maung Maung Tin.
- 86. CYLINDRICAL undecorated, (brown wood; five squared off incisions around body of bead; 16 mm length, 10 mm diameter, with each incision being 2 mm width): Srikshetra; collection U Win Maung (Tampawaddy). No evidence of incisions ever having been filled, or of bead having been blackened.
- 87. CYLINDRICAL with white lines, (black; stone; eight evenly spaced zig-zag lines; 43 mm length, 12 mm diameter): *Beikthano; Department of Archaeology [National Museum, Yangon].* The bead has been cut on one end to show interior which is white stone. The black dye has penetrated about 1 mm into the body of the bead. The text (U Aung Thaw 1969) description of the bead in the excavation report does not match drawing, which is accurate when viewed against actual bead.
- 88. CYLINDRICAL undecorated, (black onyx; banded with white, light brown; 28 mm length, 12 mm width): Kyaikkatha; recorded 1992 in the collection of Sayadaw U Agga Wuntha, Kyaikkatha. One end has black and white lines reaching to the middle of the bead, while the other end is light brown, darkening to black at the end. Discovered in Kyaikkatha, Pawdawmugen, during surface levelling at the pagoda site in Kyaikkatha. Another bead found at the same time is a green stone, barrel shape, 14 mm in length and 10 mm in width.

- 89. CYLINDRICAL with white lines, (black; a single straight white band at either end with four zig-zag lines evenly spaced in central section; 20 mm length, 8 mm diameter): *Halin; collection Halin Bo Naga (now deceased).*
- CYLINDRICAL with white lines, (black; four zig-zag lines evenly spaced; 18 mm length, 6 mm diameter): Sanpannagon; recorded during survey of the site (U San Win 1985).
- 91. CYLINDRICAL with white lines, (black; five evenly spaced zigzag lines; 35 mm length, 12 mm diameter): *Taungdwingyi; collection Taungdwingyi U Hla Pa.*
- CYLINDRICAL undecorated, (black onyx with white band; 9 mm length, 5 mm width): Srikshetra; collection U Win Maung (Tampawaddy).
- CYLINDRICAL with white lines, (black; eight zig-zag lines evenly spaced; 44 mm length, 12 mm diameter): *Beikthano; Department of Archaeology*. The bead is illustrated in the Beikthano excavation report (U Aung Thaw 1969).
- 94. OTHER SHAPE undecorated, (crystal; hexagonal; 29 mm length, 11 mm wide): Srikshetra; Department of Archaeology.
- 95. CYLINDRICAL undecorated, (yellow amber; 17 mm length, 9 mm diameter): *Halin; Department of Archaeology.*
- 96. CYLINDRICAL undecorated, (yellow amber; 12 mm length, 8 mm diameter): *Halin; Department of Archaeology*.

FIGURE 23. CYLINDRICAL BEADS

FIGURE 24. CYLINDRICAL AND OTHER SHAPED BEADS

- 97. CYLINDRICAL undecorated, (green jasper; 6 mm length, 5 mm diameter): Beinnaka, Pyawbwe township; collection U Maung Maung Tin.
- 98. CYLINDRICAL undecorated, (bluish stone; 7 mm length, 4 mm diameter): Thaton, Sinbyukyun village; U San Win collection.
- 99. CYLINDRICAL undecorated, (lac colour; stone; 25 mm length, 4 mm diameter): *Waddi; recorded during field survey of site.*
- 100. CYLINDRICAL (lac colour; stone; 16 mm length, 4 mm diameter): Maingmaw; Department of Archaeology.
- 101. CYLINDRICAL undecorated, (lac colour; stone; 27 mm length, 5 mm diameter): Srikshetra; Department of Archaeology. Cross-section is triangular.
- 102. OTHER SHAPE undecorated, (crystal; 12 mm length, 5 mm diameter): Beikthano; Department of Archaeology (U Aung Thaw 1969). Cross-section is quadrangular.
- 103. OTHER SHAPE undecorated, (crystal; 21 mm length, 5 mm

diameter): Beikthano; Department of Archaeology (U Aung Thaw 1969). Cross-section is quadrangular.

- 104. OTHER SHAPE undecorated, (green jade; 14 mm length, 7 mm diameter): Srikshetra; Department of Archaeology. Cross-section is quadrangular.
- 105. OTHER SHAPE CYLINDRICAL RING undecorated, (white stone; 2 mm length, 3 mm diameter): *Halin; collection Halin Bo Naga*. A very short cylinder, this bead is almost a ring.
- 106. OTHER SHAPE undecorated, (green stone (jade); 13 mm length, 9 mm diameter): Srikshetra; Department of Archaeology Cross-section is hexagonal.
- 107. OTHER SHAPE OCTAGONAL undecorated, (crystal; 30 mm length, 11 mm at broader end, and 4 mm on narrower end): *Srikshetra; National Museum, Yangon.* The bead is a truncated octagonal shape.
- 108. OTHER SHAPE undecorated, (crystal; 15 mm length, 6 mm diameter): Beikthano; Department of Archaeology. Cross-section is hexagonal.

FIGURE 24. CYLINDRICAL AND OTHER SHAPED BEADS

FIGURE 25. CYLINDRICAL AND OTHER SHAPED BEADS, Continued

- 109. OTHER SHAPE TUBE undecorated, (green stone (jasper); quadrangular cross-section; 15 mm length, 5 mm diameter): Beikthano; Department of Archaeology. The green colour is deeply saturated, almost an emerald green.
- 110. OTHER SHAPE CONSTRICTED TUBE undecorated, (green stone (jasper); 13 mm length, 7 mm diameter): *Beikthano; Department of Archaeology*. Cross-section is round but central section is constricted.
- 111. OTHER SHAPE LEECH undecorated, (black onyx; white zonal bands; 20 mm length, 8 mm width): *Kadaw; Department of Archaeology*. Bead has a "leech" shape.
- 112. OTHER SHAPE OVOID undecorated, (black; glassy material; three natural white bands; 33 mm length): *Tanaung-daing village*

near Myingyan; collection U Maung Maung Tin. Bead is an ovoid, without a thread hole.

- 113. CYLINDRICAL RING undecorated, (brown banded stone (onyx); white band in middle; 5 mm length, 9 mm diameter): Sanpannagon; collected during field survey of the site.
- OTHER SHAPE POINTED TUBE undecorated, (green stone (jade);
 25 mm length, 6 mm wide at broader end): Beinnaka; Department of Archaeology. There is no thread hole.
- 115. OTHER SHAPE LENS undecorated, (green stone (jade); 5 mm length, 8 mm diameter): *Halin; Department of Archaeology.* Bead is circular biconvex lens, with curve slighter on one side than the other.

FIGURE 25. CYLINDRICAL AND OTHER SHAPED BEADS, Continued

FIGURE 26. FLAT BEADS

- 116. FLAT with white lines, (black; white line cross with angles bisected; 19mm wide, 19mm high, 5mm thick): Waddi; recorded during field survey of the site.
- 117. FLAT with white lines, (black; white constricted square with spot in centre; 18 mm wide, 20 mm high, 5 mm thick): *Srikshetra; Department of Archaeology*. The bead is slightly rectangular; its edges are somewhat curved.
- 118. FLAT with white lines, (orange; white lines form enclosed cross which does not reach edges; 11 mm wide, 11 mm high, 4 mm thick): *Maingmaw; recorded during field survey*. This pattern was typical at Maingmaw, also being seen on somewhat larger (19 mm square) beads.
- 119. FLAT with white lines, (black; white lines form two squares enclosed inside each other; 18 mm wide, 19 mm high, 5 mm thick): Srikshetra; Department of Archaeology.
- 120. FLAT with white lines, (black; white lines form double cross which extends to edges; 19 mm wide, 19 mm high, 5 mm thick): Srikhsetra; Department of Archaeology.
- 121. FLAT with white lines, (black; white lines form four regularly spaced circles, each about 5 mm diameter; 19 mm wide, 18 mm high, 5 mm thick): Waddi; recorded during field survey of the site.

- 122. FLAT with white lines, (black; white lines form double cross which extends to edges; 16 mm wide, 15 mm high, 4 mm thick): Waddi; recorded during field survey of the site.
- 123. FLAT with white lines, (black; white lines form four pointed star with a white spot in centre; 17 mm wide, 15 mm high): *Maingmaw; Department of Archaeology.* Edges are slightly rounded.
- 124. FLAT with white lines, (black; white lines form small double dross in centre surrounded by slightly constricted white square; 18 mm wide, 16 mm high, 4 mm thick): *Waddi; recorded during field survey of the site.*
- 125. FLAT with white lines, (black; two straight white lines flanked by two zig-zag lines extend length of bead; 18 mm length, 8 mm high, 5 mm thick): Srikshetra; Department of Archaeology.
- 126. FLAT with white lines, (black; five evenly spaced vertical white lines; 28 mm length, 14 mm high, 5 mm thick): Waddi; recorded during field survey of the site.
- 127. FLAT with white lines, (black; white lines form a cross on both sides, with one cross being enclosed and the other extending to the edge of the bead; 9 mm wide, 10 mm high, 4 mm thick): Maingmaw; collection U Maung Maung Tin.

FIGURE 26. FLAT BEADS

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